



# Owner's Manual

*Philippians 4:13 I can do all things through Christ who strengthens me.*

Copyright Four Winds Manufacturing 2007 © Specifications subject to change.



## Manual Contents

### Page #

- 3-7 Important Safety Instructions
- 8-9 Electrical Requirements and Specifications
- 9-11 Troubleshooting Tips
- 14 Hot and Cold Weather Use
- Wiring Diagrams for 120/230 Electrical**
- 15 USA
- 16 UK
- 17 General Guidelines Site Prep/Spa Placement
- 18 Beginning Startup Procedures
- 19 Periodic Maintenance Recommendations
- 19 LED Systems
- 20 Spa Controls
- 21 MVP 260 2 Pump  
Spa Electronic Control Instructions
- 22 Balboa 300F -Series OperationsGuide
- 23 Balboa 500SZ-Series Operations Guide
- 24 ML 700 3 Pump  
Spa Electronic Control Instructions
- 25 ML 900 Quick Reference Guide

# IMPORTANT SAFETY INSTRUCTIONS

1. READ AND FOLLOW ALL INSTRUCTIONS
2. **DANGER** - Do not lay across the foot well. Always, sit in an upright position.
3. **WARNING** - To reduce the risk of injury, do not permit children to use this product unless they are closely supervised.
4. **CAUTION** - Water temperature may rise when jets are operating on “high” speed for extended duration.
5. A bonding lug has been provided on the outside of the Equipment Package electrical control box. The lug permits the connection of No. 8 AAWG (8.42mm<sup>2</sup>) solid copper bonding conductor between the Equipment Module and all other electrical equipment and exposed metal in the vicinity, as may be needed to comply with local regulations.
6. **WARNING** - This unit must be hardwired only to supply circuit that is protected by ground fault circuit interrupter (GFCI) see diagram 1. Such a GFCI is required by most building codes and should be provided by the installer and must be tested before each use. Consult GFCI manufacturers’ instructions for correct testing and operation.
7. The electrical supply for this product must include a suitable rated switch or circuit breaker to open all ungrounded supply conductors to comply with the National Electrical Codes. The disconnection means must be readily accessible to the tub occupant but installed at least 5 feet (1.5M) from spa water.
8. Spas must be installed with drainage for electrical equipment compartment.
9. Be sure the water always flows freely from the hydrotherapy jets within the spa. Any blockage or restriction of this water flow by persons or objects may damage system components, create an electrical shock hazard, and or cause water damage to the surrounding area.
10. To avoid damage to the pump(s) and heater, the Equipment must never be operated unless the spa is filled with water.

**WARNING:** CHILDREN SHOULD NOT USE SPAS OR HOT TUBS WITHOUT ADULT SUPERVISION

**AVERTISSEMENT:** NE PAS LAISSER LES ENFANTS UTILISER UNE CUVE DE RELAXATION SANS SURVEILLANCE

**WARNING:** DO NOT USE SPAS OR HOT TUBS UNLESS ALL SUCTION GUARDS ARE INSTALLED TO PREVENT BODY AND HAIR ENTRAPMENT

**AVERTISSEMENT:** POUR ÉVITER QUE LES CHEVEUX ou UNE PARTIE DU CORPS PUISSENT ÊTRE ASPIRÉS, NE PAS UTILISER UNE CUVE DE RELAXATION SI LES GRILLES DE PRISE D’ASPIRATION NE SONT PAS TOUTES EN PLACE

**WARNING:** PEOPLE USING MEDICATIONS AND/OR HAVING AN ADVERSE MEDICAL HISTORY SHOULD CONSULT A PHYSICIAN BEFORE USING A SPA OR HOT TUB AND

**AVERTISSEMENT:** LES PERSONNES QUI PRENNENT DES MÉDICAMENTS ou ONT DES PROBLÈMES DE SANTÉ DEVRAIENT CONSULTER UN MÉDECIN AVANT D'UTILISER UNE CUVE DE RELAXATION

11. **WARNING** - 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.
12. **WARNINGS -WATER TEMPERATURE.** Never heat your spa water above 104 F (40 C). If you do, it could cause serious health hazards.
13. **DANGER-RISK OF ELECTRICAL SHOCK.** Install at least 5 feet (1.5m) from all metal surfaces. (A spa may be installed within 5 feet of metal surfaces if each metal surface is permanently connected by a minimum No. 8 AWG(8.4 mm<sup>2</sup>) solid copper conductor attached to the wire connector on the terminal box that is provided for this purpose.)
14. **DANGER-RISK OF ELECTRICAL SHOCK.** Do not permit any electrical appliance such as a light, telephone, radio, or television within 5 feet (1.5m) of a spa.
15. **WARNING** - Water temperature in excess of 38°C may be injurious to your health.  
**AVERTISSEMENT:** IL PEUT ÊTRE DANGEREUX POUR LA SANTÉ DE PLONGER DANS DE L'EAU À PLUS DE 38°C.
16. **WARNING** - Pregnant or possibly pregnant women should consult a physician before using a spa or hot tub.  
**AVERTISSEMENT:** LES FEMMES ENCEINTES, QUE LEUR GROSSESSE SOIT CONFIRMÉE ou NON, DEVRAIENT CONSULTER UN MEDECIN AVANT DI UTILISER UNE CUVE DE RELAXATION.
17. **WARNING** - Do not use a spa or hot tub immediately following strenuous exercise.  
**AVERTISSEMENT:** NE PAS UTILISER UNE CUVE DE RELAXATION IMMÉDIATEMENT APRÈS UN EXERCICE FATIGANT.
18. **WARNING** - Prolonged immersion in a spa or hot tub may be injur to your health.  
**AVERTISSEMENT:** L'UTILISATION PROLONGÉE D'UNE CUVE DE RELAXATION PEUT ÊTRE DANGEREUSE POUR LA SANTÉ LA.
19. **WARNING** - To avoid injury exercise care when entering or exiting the spa or hot tub.  
**AVERTISSEMENT:** POUR ÉVITER DES BLESSURES, USER DE PRUDENCE EN ENTRANT DANS UNE CUVE DE RELAXATION ET E.-: SORTANT.
20. The ideal temperature of your spa or hot tub should be between 95 and 104 F (35-40 C). This range is not only healthier but will also result in easier care of your spa.
21. Since excessive water temperatures have a high potential for causing fetal damage during the early months of pregnancy, pregnant or possibly pregnant women should limit spa temperatures to 100 F or less.

22. Before entering a spa, the user should measure the water temperature with an accurate thermometer since the tolerance of water temperature regulating devices may vary as much as +/-5 degrees.
23. The use of alcohol, drugs, or medication before or during spa use may lead to unconsciousness with the possibility of drowning.
24. Persons suffering from obesity or with a medical history of heart disease, low or high blood pressure, circulatory system problems or diabetes should consult a physician before using a spa.
25. 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.
26. Because occasional users of the spa may not be aware of all the potential risk associated with spa usage, they should be made aware of these Important Safety Instructions.
27. **CHEMICAL SAFETY - Play it safe with chemicals.**
28. Maintain sanitizer level of 3-5 ppm of bromine or chlorine.
29. Do not mix chemicals with each other before adding them to the water. Add only one chemical at a time.
30. Never add concentrated liquid chemicals directly to the water. Always dilute chemicals in a large plastic bucket or pail before adding them.
31. When diluting chemicals, always add them to the water. Never add water to the chemicals.
32. Always dilute the chemical slowly and evenly before adding into the water. Never add any chemical, diluted or otherwise, into any skimmer device.
33. Always store chemicals according to the manufacturer's label directions and keep them out of reach of children.
34. A green colored terminal or a terminal marked G, GR, Ground, Grounding, or the symbol\* is located inside the supply terminal box or Compartment. To reduce the risk of electric shock, this terminal must be connected to the grounding means provided in the electric supply service panel with a continuous copper wire equivalent in size to the circuit conductors supplying this equipment. \*IEC Publication 417, Symbol 5019.
35. 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 hot tub or spa to these terminals with an insulated or bare copper conductor not smaller than No. 6 AWG.
36. All field-installed metal components such as rails, ladders, drains or other similar hardware within 3 m of the spa or hot tub shall be bonded to the equipment grounding bus with copper conductors not smaller than No. 6 AWG.

**SAVE THESE INSTRUCTIONS.**

## **STEREO SPA SAFETY INSTRUCTIONS**

- A. **“CAUTION”** - Risk of Electric Shock. Do not leave compartment door open. Self closing door provided.
- B. **“CAUTION”** - Risk of Electric Shock. Replace components only with identical components.
- C. **“WARNING”** - Prevent Electrocution. Do not connect any auxiliary components (for example cable, additional speakers, headphones, additional audio / video components, etc.) to the system.
- D. Do not service this product yourself as opening or removing covers may expose you to dangerous voltage or other risk of injury. Refer all servicing to qualified service personal.

# Hyperthermia

**WARNING:** THE USE OF ALCOHOL OR DRUGS CAN GREATLY INCREASE THE RISK OF FATAL HYPERTHERMIA IN HOT TUBS AND SPAS

LA CONSOMMATION DI ALCOOL ou DE DROGUE AUGMENTE CONSIDERABLEMENT LES RISQUES D'HYPERTHERMIE MORTELLE DANS UNE CUVE DE RELAXATION.

The causes, symptoms, and effects of hyperthermia may be described as follows. Hyperthermia occurs when the internal temperature of the body reaches a level several degrees above the normal body temperature of 37 C.

## **The Symptoms of Hyperthermia Include:**

- Dizziness
- Fainting
- Drowsiness
- Lethargy
- Increase in Internal Body Temperature

## **The Effects of Hyperthermia Include:**

- Unawareness of Impending Danger
- 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

## **Electrical Safety:**

### **Servicing your own spa**

Four Winds Manufacturing does not recommend that you service this spa but IF you choose to open the spa electrical panel and service the spa yourself always assume that there is power (230Volts) to the system, unless you have verified with a test meter that there is no power to the panel. There are generally no user serviceable parts inside this panel unless you have proper training. If you are not properly trained, call your selling dealer for service. If they will not help you call Four Winds Manufacturing technical service.

## **Electrical Requirements USA & UK**

**\*\*Electrician Please Read: Connections made improperly,** or the use of wire gauge sizes for power connection which are too small, may continually blow fuses in the spa control pack, may also damage the internal electrical controls and components, and/or may be unsafe and in any case will VOID the spa Warranty.

**Please have your electrician read the following instructions carefully before attempting installation of spa wiring.**

*\*Always be sure that power is not applied to circuits while performing any electrical work.*

**\*\***You can locate your incoming wire anywhere in the cabinet that is close to the source of the incoming electricity and run it through the cabinet to the spa pack. Seal around the conduit that you placed through the hole in the side panel.

All 120 Volt capable spas require a Dedicated 20 AMP GFCI Service Connection. An optional 20 Amp GFCI 12ft cable is available from Four Winds Manufacturing. Never use an extension cord to run your spa. Meeting this standard may require you to have your standard receptacle and/or circuit breaker upgraded by a Licensed Electrician. National Electrical Code 680-42

**\*\***Note: 120V versions are not available in the UK.

All 230 Volt spas require a Dedicated 60 AMP GFCI Service Connection with a 6/3 AWG (Four Wire) All Copper Conductors. National Electrical Code 422-20

**\*\***Note: UK spas require 32 Amp R.C.D. 6 or 8/2 AWG (Three Wire) All Copper conductors.

Code also requires a disconnect that is readily accessible to spa users, but at least 5 feet from spa.

We recommend using 230Volt Connections in all spas that are 230Volt capable to conserve electricity by getting the most use from the heater element.

*All of our spa equipment is designed to operate on 60Hz alternating current. The exception is UK models that are designed to operate on 50HZ.*

**\* Schematics on page 9 for USA and 10 for UK**

**\*\* Additional instructions on next page**

**It is the responsibility of the Spa owner** to make sure that all electrical connections are made by a Qualified Electrician in accordance to the National Electrical Code and/or any local or State Electrical Codes that may be enforceable at the time of installation. All connections must be made in accordance with the wiring Diagram/ Instructions inside the Spa Control Pack.

A copper bonding lug connector has been provided on the Spa Control Pack to allow for connection to local ground points. A 6 AWG copper ground wire is required and must be connected securely to a grounded metal structure item such as a cold water pipe or the main ground lug inside of the connecting electrical panel.

### **GFCI Breaker Concerns**

If after you wire your spa and apply power the GFCI breaker will not stay engaged as soon as you power the spa up. The GFCI breaker is not wired correctly. Check the GFCI breaker wiring chart following this section and verify that all of your connections are correct. Generally if the breaker will not stay engaged, it is a wiring problem on the neutral wire. \*\*Note: The neutral and the ground wire cannot touch anywhere in the line between the GFCI breaker and the spa including a disconnect box if equipped. (See wiring schematic included)\*\* If grounds and neutrals are tied together the breaker will trip.

### **Trouble Shooting:**

***If you need service you should call your selling dealer first. If you are installing your spa and your electrician is still onsite they can check the information below for help.***

### **If Your Spa Will Not Run Upon Initial Startup**

If after you wire your spa and apply power the spa will not run or the top side control will not light you should first check the spa control pack fuses. It is easy to blow fuses when first wiring a new spa if you accidentally put the wires in the wrong place, or touch anything powered in the spa control pack to ground. There is a main safety fuse in the pack that is designed to protect the whole board from a miss wire or a lightning strike. This fuse is usually a 3/10 amp fuse. (That means less than one amp) Fuses and miss wired boards are not covered by Warranty unless a defective covered part blows them.

**\*\*Continued for additional concerns**

**If a pump will not run** you could have a blown fuse, see *Cold Weather Startup* if it's cold outside when spa is installed. Most two pump packs like a VS300 VS501 have one fuse. The three pump packs like a EL2000M3/8000-M3 also have two fuses, however, on this pack one fuse operates pumps one and three, and the other fuse operates pump two only. These fuses cannot be checked in the 230V circuit. Your **Professional Installer** will need to remove them and perform an "ohm" check across them. He can substitute a two speed pump for a one speed pump while testing to determine if the concern is the pump or the circuit. He may also substitute a 30 am fuse for a 25 amp fuse.

\***Note:** These fuses can be acquired at most Lowe's or Home Depot and are SC or SLC 25's or 30's.

Four Winds Manufacturing, or its authorized service centers will not be held responsible for damage to spa and/or components caused by improperly wired spas or any personal injury related to an owners attempt to repair a spa. Replacement costs will be the responsibility of the spa owner.

**Spa Running not Heating:** If your spa has worked and heated before with no problem and it suddenly is dropping temperature check first to be sure you haven't accidentally put the controls in the sleep mode. On **most** controls you can touch the (temp) button then the (light) button this will take you through 3 different modes if equipped.

ST=Standard mode the spa will filter as set and heat as needed

EC=Economy mode the spa will filter as set and only heat during the filter set modes

SL=Sleep mode will maintain 20° below set temperature only use for 4 week or longer periods of non use.

\*\***Note:** How to Adjust the filter cycle times is found in spa electronic control instructions.

**FL or FLO Code:** This code means that the pressure switch is indicating an open circuit. This can be caused by the pressure switch not closing when the main pump engages and starts moving water or that there is no water in the spa, or the main pump is not working or that there is a restriction in the water movement going through the heater like a clogged filter. First verify that the main pump is running by listening for operation and looking for water movement. If you find no water movement and no sound from the pump check the fuses. Next stop the pump and remove the filter and start the pump again if this solves the (Flo) code the filter is clogged and needs replacement. If all of these items are OK you can verify the pressure switch failure by shorting the two wires together on the pressure switch located on top of the heater tube. This is a normally open circuit and water movement pressure is what closes the circuit in the pressure switch. If shorting the wires together starts the spa heater to work again, the pressure switch must be replaced.

## 1) Spa Runs Continuous:

Check your preset filter cycle setting, you may be on a longer filtration setting than needed.

Example F2:

From time power is turned on to spa 7 minutes later your automatic filtration start and will filter on low speed for 2 hours or until water temp reaches preset level. Then 12 hours later spa will start its automatic filtration for another 2 hours. Overall the best time frame for filtration is 7:00 am - 9:00 am and 7:00 pm - 9:00pm. Avoid your spa automatic filtering between 10:00 am - 5pm in July and August, being the hottest part of the day.

**\* Note:** If the pressure switch is bad and the control tries to engage 3 times and fails it will stop the control from working. If this happens, it may be necessary to turn off the main power to reset the control.

<b><u>Code*</u></b>	<b><u>Meaning</u></b>	<b><u>Action Required</u></b>	<b>*Note: All codes may not pertain to all spas.</b>
<b>None</b>	No message on display. Power has been cut off to the spa.	The control panel will be disabled until power returns. Spa settings will be preserved until next power up.	
<b>- -</b>	Temperature unknown.	After the pump has been running for 2 minutes, the temperature will be displayed.	
<b>HH</b>	“Overheat” - The spa has shut down. One of the sensors has detected 118°F at the heater.	<b>DO NOT ENTER THE WATER.</b> 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.	
<b>OH</b>	“Overheat” - The spa has shut down. One of the sensors has detected that the spa water is 110°F.	<b>DO NOT ENTER THE WATER.</b> Remove the spa cover and allow water to cool. At 107°F, the spa should automatically reset. If spa does not reset, shut off the power to the spa and call your dealer or service organization.	
<b>IC</b>	“Ice” - Potential freeze condition detected.	No action required. The pump and blower will automatically activate regardless of spa status.	
<b>SA</b>	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.)	
<b>SB</b>	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.)	
<b>SN</b>	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.	
<b>HL</b>	A significant difference between 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.	
<b>LF</b>	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 capability of the spa will not reset automatically; you may press any button to reset.	
<b>dr</b>	Possible inadequate water, poor flow, or air bubbles in detected in the heater. Spa is shut down for 15 minutes.	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.	
<b>dy</b>	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. Press any button to reset.	

©Four Winds Manufacturing 2007 BGSJ

## 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 connections. Installation must be performed by a licensed electrician and all grounding connections must be properly installed.

## 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. Spa settings will be preserved until next power up.
--	Temperature unknown.	After the pump has been running for 2 minutes, the current water temperature will be displayed.
<b>OHH</b>	“Overheat” - The spa has shut down.* One of the sensors has detected 118°F/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.
<b>OH5</b>	“Overheat” - The spa has shut down.* One of the sensors has detected that the spa water is 110°F/43.5°C.	DO NOT ENTER THE WATER. Remove the spa cover and allow water to cool. At 107°F/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.
<b>SnA</b>	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 condition.)
<b>SnB</b>	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 condition.)
<b>Sn5</b>	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.
<b>HFL</b>	A significant difference between temperature sensors has been detected. This could indicate a flow problem.	If the water level is normal, make sure all pumps have been primed. If problem persists, contact your dealer or service organization.
<b>LF</b>	Persistent low flow problems. (Displays on the fifth occurrence of <b>HFL</b> message within 24 hours.) Heater is shut down, but other spa functions continue to run normally.	Follow action required for <b>HFL</b> message. Heating capability of the spa will not reset automatically; you may press any button to reset.
<b>dr</b>	Possible inadequate water, poor flow, or air bubbles in detected in the heater. Spa is shut down for 15 minutes.	If water level is normal, make sure all pumps have been primed. Press any button to reset. This message will reset within 15 minutes. If problem persists, contact your dealer or service organization.
<b>dry</b>	Inadequate water detected in heater. (Displays on third occurrence of <b>dr</b> message.) Spa is shut down.*	Follow action required for <b>dr</b> message. Spa will not automatically reset. Press any button to reset manually.
<b>ICE</b>	“Ice” - Potential freeze condition detected.  * - Even when spa is shut down, some equipment will turn on if freeze protection is needed.	No action required. All equipment will automatically activate regardless of spa status. The equipment stays on 4 minutes after the sensors detect that the spa temperature has risen to 45°F/7.2°C or higher. An optional freeze sensor may be added to protect against extraordinary freeze conditions. Auxiliary freeze sensor protection is advisable in colder climates. See your dealer for details.

### 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.

## **Cold Weather Startup:**

If your spa arrives and the environment where the spa is to be placed is 40° or below, your **Professional Installer** will need to put a small space heater or light bulb inside the spa cabinet to thaw out the water that may be left inside the pumps **BEFORE STARTING YOUR SPA**. If your Professional Installer starts the spa and all pump fuses blow, the pumps may have frozen water in them. Four Winds Manufacturing makes every effort to remove as much water as possible before shipping, but it is impossible to remove all water from a spa plumbing system, therefore this step is crucial before starting your spa.

## **Hot and Cold Weather Use**

### **Cold Weather Use:**

Because it is impossible to remove all water from your spa we recommend that you never shut your spa down and drain the water during the cold seasons if you live in an area where freezing would be a possibility. Freeze damage is not a covered repair. If your spa quits heating during the cold seasons it is your responsibility to protect the spa from damage until repairs can be made. To protect your spa you can put a simple light bulb or a small space heater inside the spa cabinet and place the door back over the opening. You don't have to screw the door completely back into place, use only two to hold it. Contact your selling dealer for service.

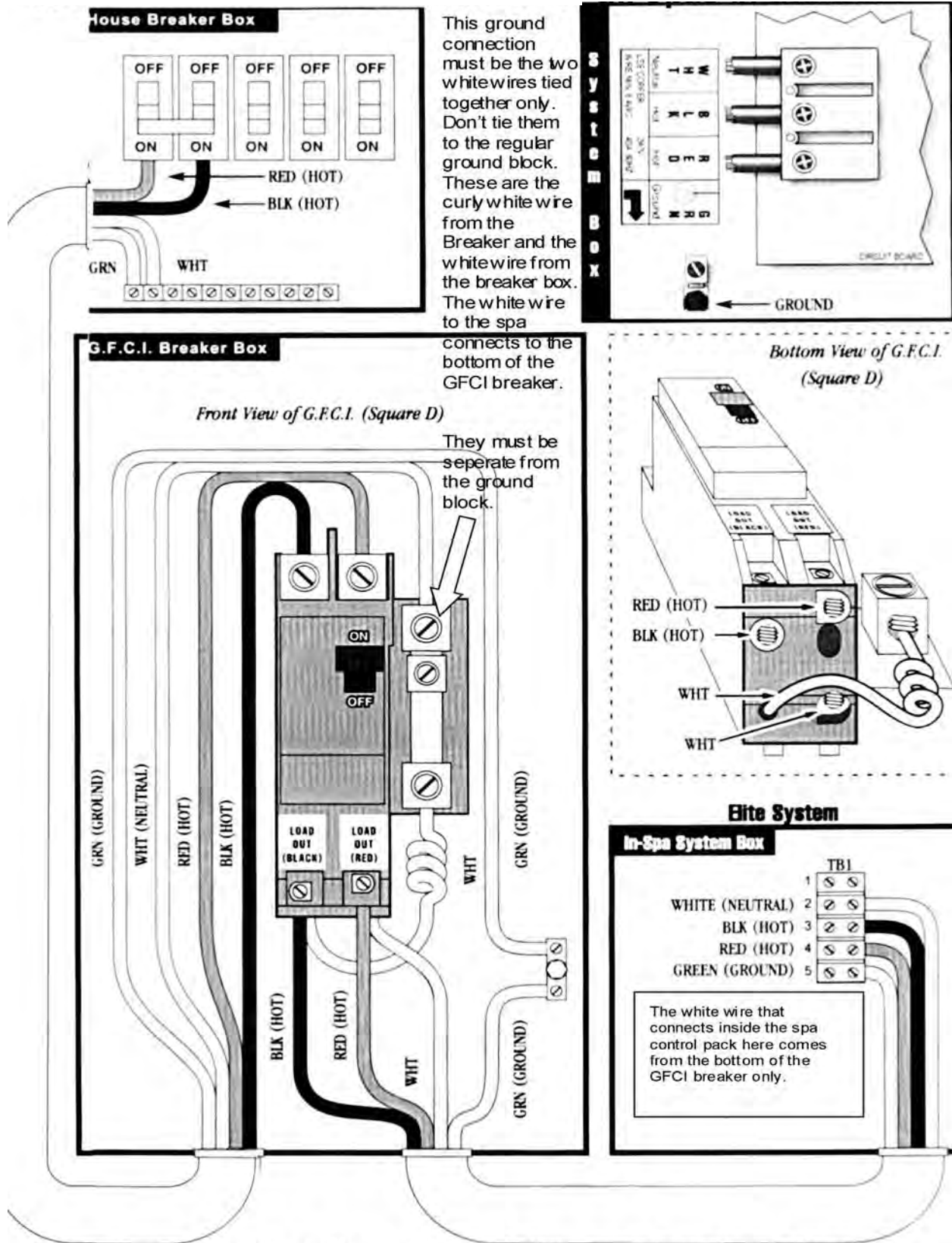
### **Hot Weather Use:**

If you choose to shut your spa down for the warmer seasons of the year you should drain as much water as possible, clean the spa shell and keep the cover in place. We recommend that you keep the spa running through this season and just turn the temperature down to a more comfortable range or change the system to sleep mode, and avoid automatic filtration between 10am and 5pm. Avoid F6, F8, FC filter cycle setting. A spa will last longer if it is allowed to run all of the time.

### **Filter Removal:**

Never try to remove your spa filter lid, basket or cartridge while spa pump is running. Turn spa breaker off. Turn lid of filter counter-clockwise 1/4 turn to remove. Pull basket out & remove filter. Reverse process for installation. If your basket & lid will not lock, your filter cartridge is not sitting in the housing properly or the basket is not sitting on the filter cartridge properly.

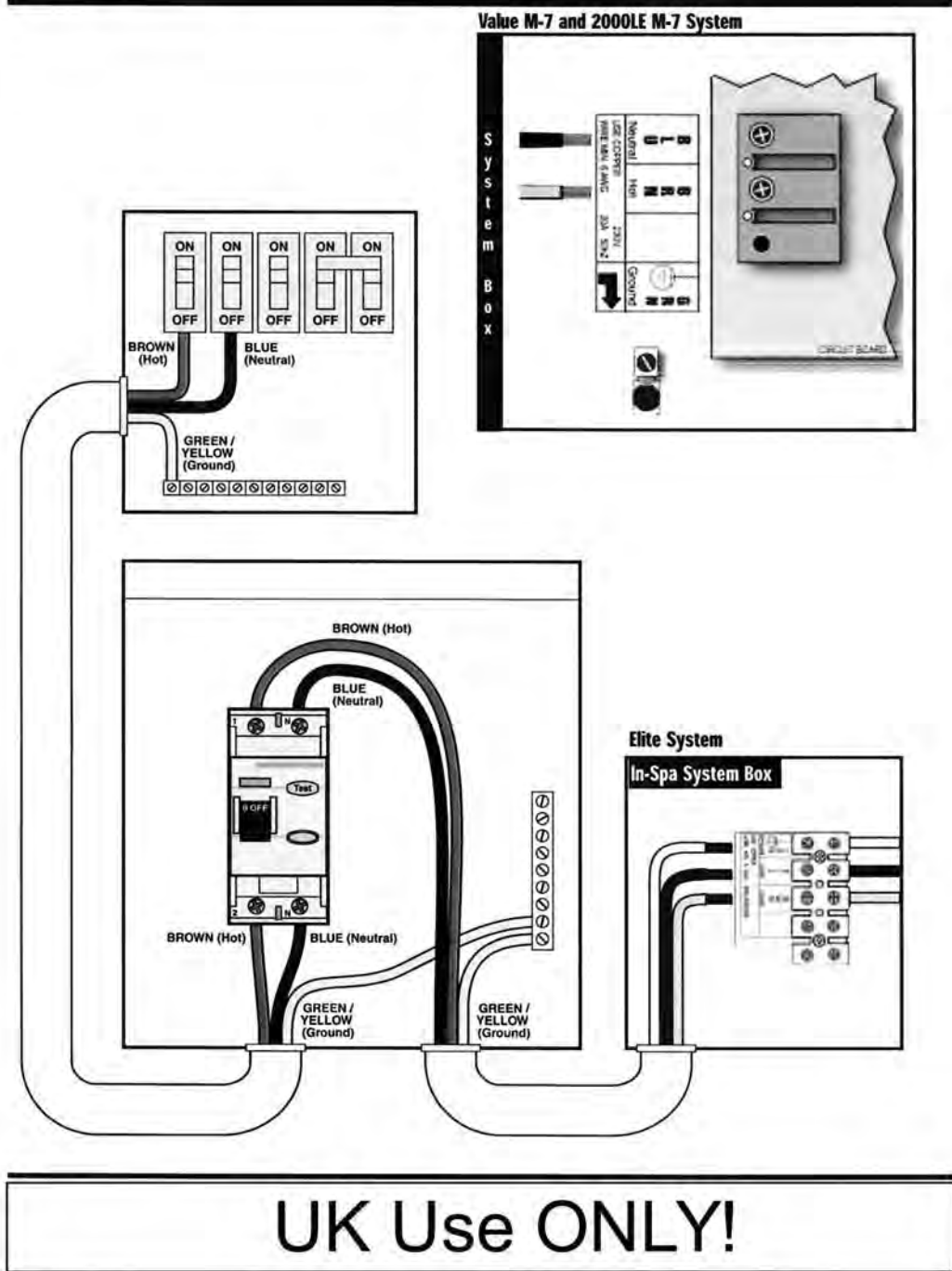
# 60 AMP GFCI WITH 6-3GROUND WIRE standard for all spas in the USA



You should have a disconnect at the spa for all applications and should be located within sight from equipment.

# 60 AMP GFCI WITH A RATED TRIPPING CURRENT NOT EXCEEDING 30 MA.

## Wiring Schematic



# General Guidelines for Site Preparation

**Requirements for Access:** The size of the actual spa you choose will of course determine the amount of space needed to move the spa from the street to it's final resting area. Be sure to measure all gate and door openings, also look for any vertical obstructions such as roof overhangs, power lines, etc.... another thing to look at is trees, shrubs, deck railings, etc.....

**Inside Installation:** (We do not recommend installing hot tubs inside and any damage caused by leaks or any other concerns are not covered ) If you are installing the spa indoors, make sure that there are no areas with dimension limitations such as ceilings, stairs, hallways, and walls based on the size of the spa you chose. Also make sure that the floor in the area the spa is placed will handle the weight. Water weighs just over 8lbs per gallon you can do the math based on the unit you purchased.

**Pad and Surface requirements:** We require a 3 to 4" completely flat reinforced concrete surface. When a spa is completely filled and has occupants it can weigh several tons so care has to be taken when placing on any surface other than solid concrete 3 to 4" thick. Therefore when placing on a deck, balcony or indoors you must make sure that the surface can offset at least 100 lbs per square foot. Your selling dealer is not usually qualified to make judgments on weight bearing abilities of structures so always consult a qualified professional in that area of expertise.

## **Spa Placement**

When deciding where to place the spa in the area you have available you should think of:

Where the electricity will come into the machine and where you will enter the spa as opposed to the best entry point of the area.

Will there be access to all sides of the spa for future service. Note: If you choose to place the spa in a place where any side is covered and access is limited and you need any kind of service whether Warranty or regular pay that requires additional time to gain access you will most likely be assessed additional fees for service.

Also consider if you will be using a cover lift like a side mount style you will need about 24" of space roughly off the side that your cover will come back on. If you have limited space there are other types of lifts available that can lift the cover without needing any space outside of the spa. If you are placing your spa under a roof you will need at least the width of half of your cover plus 6" from the top of your spa to the bottom of the roof to have access to open the spa cover.

If you choose to place your spa into an area that has a structure built around it **any** damage caused by that spa is not covered by the warranty. Example: leaks that damage carpet in a room or a wood floor, etc.....

## **Beginning Startup Procedures**

Once your spa is properly wired and ready to start, fill the spa up with water. Generally you will fill the spa up to the bottom of the highest set of neck jets in the spa or about 6 inches above top of the floating filter housing ring. Remember this level will rise as people get into the spa, so you just want to get the water to a level that will keep the water from splashing out with no one in the spa. Next watch the topside control panel and it will show you either a PR for priming mode. Either way touch the pump button designated for the main 2 speed pump to test the pump for water movement. Note: (If there is no water movement but you hear the pump running see Pump Bleeding.) If you have water movement, touch the next pump button and verify movement and repeat the same procedure until all pumps are moving water. Then watch for the heat indicator to come on the top-side.

**Note:** *All 110V spas or any spa set in the 20Amp mode will only heat with the main two speed pump alone on low speed. All three pump (230V) spas will not heat with pump three engaged.*

Once the heat light is verified to be on, your spa is heating. Two and Three pump USA spas will heat about 6 degrees per hour. One & Two pump UK spas will heat about 3 degrees per hour. One pump USA 230V spas will heat about 4 degrees per hour and 120V spas will heat about 1 degree per hour. All of these times are approximate not exact.

If your spa has a PR code on the topside it will take 4 to 6 minutes for it to go into the regular heating mode.

Some spas have the PR feature others don't. The ones that don't will go straight into the heating cycle in 1 or 2 minutes.

## **Recommendations for Periodic Maintenance**

**Filter or filters:** Clean the filter once a month by backwashing with water or placing it in the dishwasher and allowing it to dry out before reinstalling. Replace the filter one a year.

**Cover:** Clean the cover with soap and water once per month to remove tree sap, dirt, etc.....

**Water:** Replace the water 2 to 6 months based on your amount of use, personal preference, or dealer recommendations.

**Side Panels:** Wash the side panels periodically with water.

**Spa Shell:** When you change the water wipe the shell down with Fast Orange or some other biodegradable cleaner and rinse the shell out and drain the water out or vacuum it out of the foot well.

**LED Light System:** (If equipped) This system offers a series of steady light colors and then constant change light colors as you toggle the light switch off and on. The light system has Led bulbs in each light assembly with a 12 Led light in the position of the main spa light that will also change colors with the rest of the system. The operation of the system is as follows;

<b>Auto mode</b>	<b>1. Automatic color change 3 primary colors Blue - Red - Green.</b>
<b>Solid colors</b>	<b>2. Dark Blue</b>
<b>Solid colors</b>	<b>3. Orange</b>
<b>Solid colors</b>	<b>4. Purple</b>
<b>Solid colors</b>	<b>5. Green</b>
<b>Solid colors</b>	<b>6. Red</b>
<b>Solid colors</b>	<b>7. Hot Pink</b>
<b>Solid colors</b>	<b>8. Light blue (Cyan)</b>
<b>Solid colors</b>	<b>9. Neutral (white)</b>
<b>Auto mode</b>	<b>10. Automatic color change Assorted colors</b>
<b>Auto mode</b>	<b>11. Blue - Green ---- changes by fading in and out</b>
<b>Auto mode</b>	<b>12. Party Mode ---- Assorted colors changing fast.</b>

**22 LED single light:** (If equipped) This light replaces the clear 12V bulb and also goes through a series of steady colors and then color changes it has 12 different changes in all. You activate these changes by toggling the power off and on.

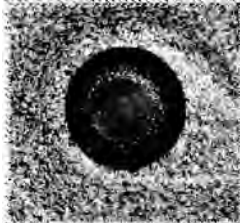
## Understanding Spa Controls



**Air Valve:** This valve, when turned to the right, will add air to the jets that are connected to that particular valve. This extra air will add power to the jets and offer a more vigorous massage. Therefore you have both types of massages, a straight jet type and then an air injected type. There are generally 2 of these controls each working a different set of jet seats. Some three pump spas may have three of these controls. When not in use we recommend that you keep these valves closed to cut down on the chance of foaming.



**Diverter Valve:** The diverter valve (if equipped) splits the power of a pump between two sets of jets or a set of jets and a Master Massage jet or jets. This is a very large valve.



**Waterfall/Water Show Control:** This control (If equipped) operates the waterfall output volume. Also on models with pop-up Water Show you will find a control for the fountains.

**Clydesdale Models** with the Vanishing Edge Type Waterfall have a control for the fall and a control for the Water Show. The Water Show should be shut off completely before closing the cover and the waterfall should be left on to flow slightly to circulate the water in the Vanishing Edge through during filter cycles.



**Cascading Waterfall:** (If Equipped) This waterfall can be used as an access handle to assist with entrance into the spa. Caution: Do Not put full body weight on the handle. It is designed to be an assist handle only.



**Main Jets:** These jets come in various sizes and jet types. The single hole eyeball style can be adjusted to point in a particular direction and the whirly two hole style will push water out in a circular pattern. All other jets will only move water in a straight forward pattern. These jets can be power adjusted from full power to off by turning the outside body of the jet.



**Bullet Style Jet:** These jets offer a straight non-adjustable water stream and this type cannot be adjusted for direction or strength.

\*Jets are standard in Black and optional in Stainless Steel



**Outside Spa Drain:** This drain (If equipped) is mounted on the spa side panel. To operate you grab the handle on the cap and pull it straight out then turn it about 1/4 turn to the left and pull it out some more. This will lock the tube into place so you can remove the cap and not loose any water. Then attach a water hose to the tube and push the tube in about 1 inch and drain the water or air as needed. After finishing you simply pull the tube back out 1 inch, remove the hose, install the cap and push the tube back in until it stops then twist the tube to the right and push the rest of the way back in to hide away.

# MVP260 Control Reference Card

*Non-Circ Operation*

## Initial Start-up

When your spa is first actuated, it will go into Priming mode, indicated by "Pr". **Please see the M-7 Installation Instruction Manual for complete instructions on power-up and Pump Priming.** 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.



### Temp/Set (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 "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.")*

### Jets

Touch the "Jets" button once to activate the low speed of the pump and again for the high speed. Press the "Jets" button again to turn off the pump. If left running, the low speed of the pump will automatically turn off after 4 hours, and the high speed will automatically turn off after 15 minutes. The low speed of the pump runs when the blower is on. It may also activate for at least 2 minutes every 30 minutes to detect the spa temperature and then to heat to the set temperature if needed, depending upon the mode. When the low speed turns on automatically, it cannot be deactivated from the panel; however, the high speed may be started.

### Jets 2 (optional)

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

### Light

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

### Mode

Mode is changed by pressing the "Temp" or "Set" button, then pressing the "Light" 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. "SE" 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 temperature is not current, and will alternate with temperature when 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 temperature is not current, and will alternate with temperature when temperature is current.

### 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 "FC"). 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.

### 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 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.

# Balboa 300F-Series Operation Guide

## For Systems with Software v41 Only.

### Initial Start-up

Your spa will enter Priming Mode (Pr) when it is energized. During Priming Mode, press “Jets” button repeatedly and be sure the pump is free of air. Priming Mode lasts less than 5 minutes. Press “Temp” to exit. After Priming Mode, the spa will run in Standard Mode (see Mode section). Some panels may not have a “Temp” button. On these panels the “Set,” “Warm,” or “Cool” buttons are used.

Pump 1 low-speed is responsible for heating and filtration and will be referred to simply as the pump.

In multi-button sequences, if the buttons are pressed too quickly in sequence, they may not register.



Button shapes and labels may vary.

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

The last measured water temperature is constantly displayed. The water temperature displayed is current only when the pump has been running for at least 1 minute.

On panels with a single “Temp” or “Set” button, to display the set temperature, press the button once. To change the set temperature, press the button a second time before the display stops flashing. Each press of the button will continue to either raise or lower the set temperature. If the opposite direction is desired, allow the display to revert to the current water temperature. Press the button to display the set temperature, and again to make the temperature change in the desired direction.

On panels with “Warm” and “Cool” buttons, to display the set temperature, press “Warm” or “Cool” once. To change the set temperature, press a temperature button again before the display stops flashing. Each press of “Warm” or “Cool” will adjust the set temperature.

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

### Jets

Press “Jets” to turn the pump on or off, and to shift between low and high speeds (if equipped). If left running, the pump will turn off after a preset length of time, which on some systems may be as long as 2 hours for low speed. Low speed may run automatically at times, during which it cannot be deactivated from the panel, but high speed may be operated. The ozone generator (if installed) will activate anytime low speed is running.

### Light

Press “Light” to operate the spa light. Turns off after 4 hours.

### Mode

Depending on system configuration, mode changing may not be available and will be locked in Standard Mode.

Mode is changed by pressing “Temp,” then “Light”.

**Standard Mode** maintains set temperature. 5t will be displayed momentarily when you switch into Standard Mode.

**Economy Mode** heats the spa to the set temperature only during filter cycles. 5c will display when water temp is not current, and will alternate with water temp when the pump is running.

**Sleep Mode** heats the spa to within 20°F/10°C of the set temperature only during filter cycles. 5l will display when water temp is not current, and will alternate with water temp when the pump is running.

### Preset Filter Cycles

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

Filter duration is programmable for 1, 2, 3, 4, 5, 6, 7, or 8 hours. The default filter time is 1 hour.

To program, press “Temp,” then “Jets.” Press “Temp” to adjust. Press “Jets” to exit programming.



# Balboa 500SZ-Series Operation Guide

## Initial Start-up

Your spa will enter Priming Mode (Pr) when it is energized. During Priming Mode, press “Jets” button(s) repeatedly and be sure all pumps are free of air. Priming Mode lasts for less than 5 minutes. Press “Warm” or “Cool” to exit. After Priming Mode, the spa will run in Standard Mode (see Mode section).

The pump responsible for heating and filtration (pump 1 low-speed on non-circ system, or the circ pump on circ systems) will be referred to simply as the pump.

In multi-button sequences, if the buttons are pressed too quickly in sequence, they may not register.



Button shapes and labels may vary.

## Temp Control (80°F - 104°F / 26.0°C - 40.0°C)

The last measured water temperature is constantly displayed. The water temperature displayed is current only when the pump has been running for at least 2 minutes.

To display the set temperature, press “Warm” or “Cool” once. To change the set temperature, press a temperature button again before the display stops flashing. After three seconds, the display will stop flashing and begin to display the current spa temperature.

## Jets 1

Press “Jets 1” to turn pump 1 on or off, and to shift between low and high speeds (if equipped). The low-speed will turn off after 4 hours. 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.

## Jets 2/Jets 3/Blower (If equipped)

Press the corresponding button once to turn the device on or off. The device will turn off after 15 minutes. Pump 2 may be two-speed on some systems.

## Light

Press “Light” to operate the spa light. Turns off after 4 hours.

## Mode

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

**Standard Mode** maintains set temperature. *Std* will be displayed momentarily when you switch into Standard Mode.

**Economy Mode** heats the spa to the set temperature only during filter cycles. *Ecn* will display when water temp is not current, and will alternate with water temp when the pump is running.

**Sleep Mode** heats the spa to within 20°F/10°C of the set temperature only during filter cycles. *Slp* will display when water temp is not current, and will alternate with water temp when the pump is running.

## Preset Filter Cycles

The first preset filter cycle begins 6 minutes after the spa is energized. The second preset filter cycle begins 12 hours later. Filter duration is programmable for 2, 4, 6, or 8 hours or for continuous filtration (indicated by *FLC*). The default filter time is 2 hours for non-circ systems and 4 hours for circ systems.

To program, press “Warm” or “Cool,” then “Jets 1.” Press “Warm” or “Cool” to adjust. Press “Jets 1” to exit programming.

**For non-circ systems**, low-speed pump 1 and the ozone generator (if installed) run during filtration.

**For circulation systems**, the circ pump and the ozone generator (if installed) run 24 hours. In hot environments, the circ pump may turn off for 30 minute periods, except during filter cycles. At the beginning of each filter cycle all other equipment will run briefly to purge the plumbing.



# ML700 Quick Reference Guide



## Initial Start-up

When your spa is first actuated, it will go into Priming mode (after displaying some configuration information). **Please see the M-7**

**Installation Instruction Manual for complete instructions of 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. You can exit Priming mode early by pressing “Warm” or “Cool”.

## Mode/Prog

This button is used to switch between standard, economy, and sleep modes. Press “Mode/Prog” to enter mode programming, press “Cool” to cycle through to desired mode (LCD flashes until confirmed), then press “Mode/Prog” to confirm selection.

**Standard mode** maintains the desired temperature. Note that the last measured spa temperature displayed is current only when the pump has been running for at least 1 minute. The “**STANDARD**” icon will display until the mode is changed.

**Economy mode** heats the spa to set temperature only during filter cycles. The “**ECONOMY**” icon will display until mode is changed. Pressing “Jets 1” while in Economy mode puts the spa in **Standard-In-Economy** mode, which operates the same as after 1 hour. Both the “**STANDARD**” and “**ECONOMY**” icons display in this mode. During this time, a press of the “Mode/Prog” button will revert to Economy Mode immediately.










**Sleep Mode** heats the spa to within 20°/11°C of the set temperature only during filter cycles. The “**SLEEP**” icon will display until mode is changed.

## Time

When time hasn’t been programmed, the “**TIME**” icon flashes. (*Time settings on EL1000 and some EL2000 systems are not preserved in the event of power loss; time will have to be reprogrammed upon each power up*)

### Setting the Time

Once the spa has been properly connected the first time (every power up on the EL1000 and some EL2000 systems), notice the “TIME” icon appearing on the screen.

Press		then		Mode/Prog
Select the hour by pressing		Or		(Each press changes the time by 1 minute)
Press		to enter		
Select minutes by pressing		Or		(Each press changes the time by 1 minute)
Press		to exit the time setting procedure and enter the optional filter cycle programming. (Exits programming on some EL1000 and some EL2000 systems).		
Press		to exit programming.		

## Standby Mode

Pressing “Warm” or “Cool” then “Jets 2” will turn off all spa functions temporarily. this is helpful when changing a filter. Pressing any button resets the spa. On some systems the “Jets 1” button will control the pump in Standby Mode (“Drain Mode”). In this case, press any other button to exit.

## Locking the Panel

Press “Time” “Jets 1” then “Warm” within 3 seconds. When locked, the PL “**PL** ●” light will light. All buttons are frozen except the “Time” button. To unlock the panel, press “Time” “Jets 1” then “Cool”.

## Locking the Set Temperature

Press “Warm” or “Cool” then “Time”, “Jets 1”, and “Warm” within 3 seconds to activate the lock. The TL “**TL** ●” light will light when the set temperature is locked.

To unlock the set temperature, press “Warm” or “Cool” then “Time”, “Jets 1” and “Cool”.

## Additional Features

Refer to your User Guide for additional details and features that are available with your ML700 panel and EL/GL/ Series system.

# EL/GL Series-Mach 3

## ML900 Quick Reference Guide



### Initial Start-up

When your spa is first actuated, it will go into Priming mode (after displaying some configuration information). **Please 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. You can exit Priming mode early by pressing "Warm" or "Cool."

### Mode/Prog

This button is used to switch between standard, economy, and sleep modes. Press "Mode/Prog" to enter mode programming, press "Cool" to cycle through to desired mode (LCD flashes until confirmed), then press "Mode/Prog" to confirm selection.

**Standard mode** maintains the desired temperature. Note that the last measured spa temperature displayed is current only when the pump has been running for at least 1 minute. The "**STANDARD**" icon will display until the mode is changed.

**Economy mode** heats the spa to set temperature only during filter cycles. The "**ECONOMY**" icon will display until mode is changed. Pressing "Jets 1" while in Economy mode puts the spa in **Standard-In-Economy mode**, which operates the same as Standard Mode, then reverts to Economy Mode automatically after 1 hour. Both the "**STANDARD**" and "**ECONOMY**" icons display in this mode. During this time, a press of the "Mode/Prog" button will revert to Economy Mode immediately.










**Sleep mode** heats the spa to within 20°F (11°C) of the set temperature only during filter cycles. The "**SLEEP**" icon will display until mode is changed.

### Time

When time hasn't been programmed, the "**TIME**" icon flashes. (*Time settings on EL1000 and some EL2000 systems are not preserved in the event of power loss; time will have to be reprogrammed upon each power up.*)

#### Setting the Time

Once the spa has been properly connected the first time (every power up on the EL1000 and some EL2000 systems), notice the "**TIME**" icon appearing on the screen.

Press 	then		
Select the hour by pressing  Or  (Each press changes the time by 1 minute)			
Press 	to enter.		
Select minutes by pressing  Or  (Each press changes the time by 1 minute)			
Press 	to exit the time setting procedure and enter the optional filter cycle programming. (Exits programming on some EL1000 and some EL2000 systems.)		
Press 	to exit programming.		

### Standby Mode

Pressing "Warm" or "Cool" then "Jets 2" will turn off all spa functions temporarily. This is helpful when changing a filter. Pressing any button resets the spa. On some systems the "Jets 1" button will control the pump in Standby Mode ("Drain Mode"). In this case, press any other button to exit.

### Locking the Panel

Press "Time" "Jets 1" then "Warm" within 3 seconds. When locked, the PL "PL ●" light will light. All buttons are frozen except the "Time" button. To unlock the panel, press "Time" "Jets 1" then "Cool."

### Locking the Set Temperature

Press "Warm" or "Cool" then "Time," "Jets 1," and "Warm" within 3 seconds to activate the lock. The TL "TL ●" light will light when the set temperature is locked.

To unlock the set temperature, press "Warm" or "Cool" then "Time," "Jets 1" and "Cool."

### Additional Features

Refer to your User Guide for additional details and features that are available with your ML900 panel and EL/GL Series system.



P/N: 00508-80\_B 06/14/2006



balboa-instruments.com

