MSPA-1-AX POWER SPA PACK
SERVICE MANUAL

• by Gecko Electronics Inc. •



Visual step-by-step guide to easily identify & correct technical problems!

GECKO

Contents

Preliminary
- Required Material 3

Power & Ground Check
- GFCI 5
- Electrical Wiring 6
- GFCI Trips! 7

Programming
- Jumper Setup (MSPA-1-AX) 9
- Low Level Programming (MSPA-1-AX2, MSPA-1-AX3) 10

Error Messages
- "FLO" 13
- "FLC" 17
- "Prr" 19
- "Prh" 21
- "HL" 23
- "FrE" 27
- "CLFL" 29

Troubleshooting
- Nothing Works! 31
- Spa Is Not Heating! 35
- Pump 1 Does Not Work! 39
- Pump 2 Does Not Work! (MSPA-1-AX2, MSPA-1-AX3) 42
- Blower Does Not Work! 45
- Spa Light Does Not Work! 49
- Ozonator Does Not Work! 51
- Circulation Pump Does Not Work! 53
- Keys Do Not Work! 55

How to
- Replace the Board 57
- Adjust the Pressure Switch 61

Miscellaneous
- Wiring Diagrams 63
- Professional Repair Kit 67

In order to be as helpful as possible, most sections of this manual were written in two distinct formats: problem-solving solutions are described using both troubleshooting flow charts and step-by-step procedures.

They should be used in conjunction, flow charts giving a global overview of specific problems while step-by-step procedures are more detailed.

Although this manual has been prepared with great care, some information may seem erroneous or unclear to you. In this case, please do not hesitate to contact us with your remarks or questions.

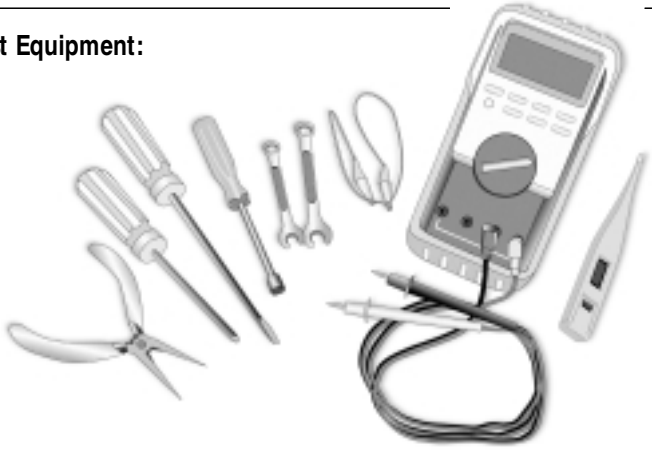
Important Safety Information

WARNING: Risk of electrical shock! All procedures described in this service manual must only be performed by qualified personnel, in accordance with the standards applicable in the country of installation and, whenever possible, with the equipment powered off. When connecting the equipment, always refer to the wiring diagram affixed to the inside of your spa pack's power box cover! This diagram always prevails over the wiring diagram at the end of this manual.

All information given subject to technical modifications without notice.

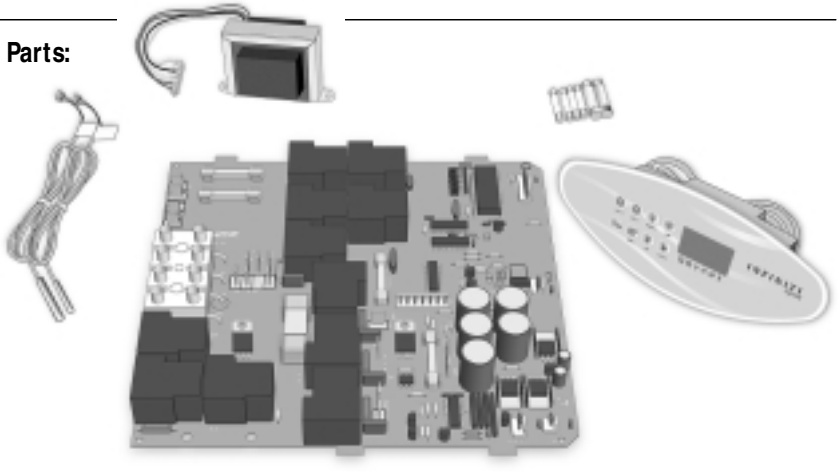
The following tools, test equipment and components are necessary to perform service calls on an MSPA-1-AX Power Spa Pack.

Tools & Test Equipment:



Pliers
Phillips & flat screwdrivers
11/32" nut driver
1/4" open-end wrench
3/8" open-end wrench
Jumper cable
Multimeter
GFCI tester & digital thermometer (optional)

Pack Parts:



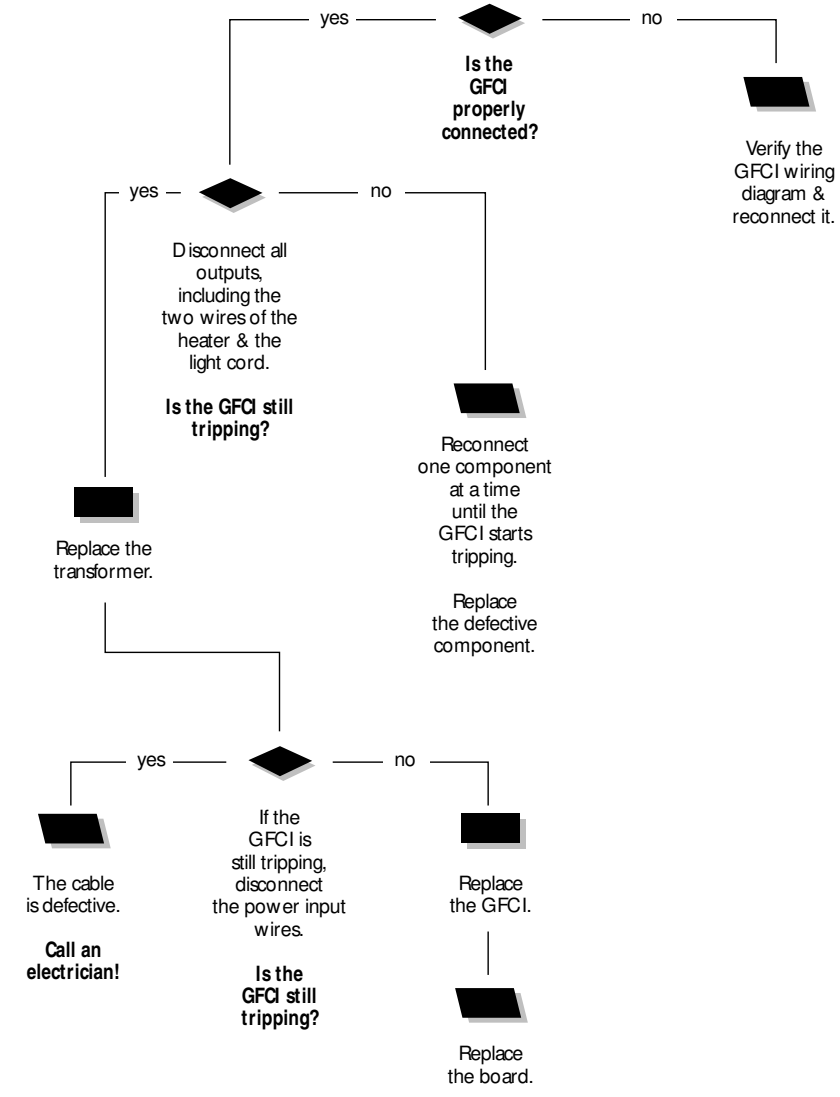
Temperature probe
Hi-limit sensor
MSPA-1-AX system board (or complete spa pack)
Transformer
Fuses
Top side control

Notes: The equipment delivered may slightly differ from the illustrations shown in this manual.

Gecko Electronics Inc. sells Professional Repair Kits that include everything needed for MSPA-1-AX Power Spa Pack servicing. Go to last page of this manual for further information.

Notes:

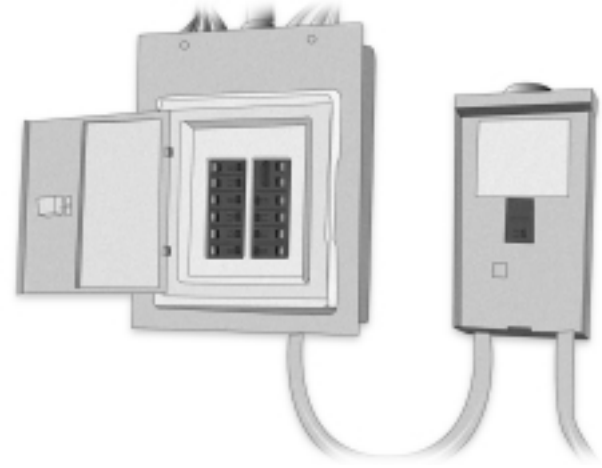
If the GFCI trips, follow the troubleshooting flow chart below to identify the source of the problem.



Electrical Wiring

Proper wiring of the electrical service box, GFCI and spa pack terminal block is essential.

- Make a visual inspection for signs of mis-wiring. Refer to the supplied wiring diagram. **Call an electrician if necessary.**

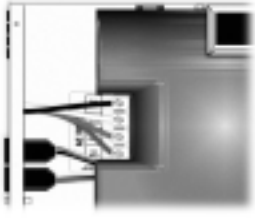




Electrical box



GFCI



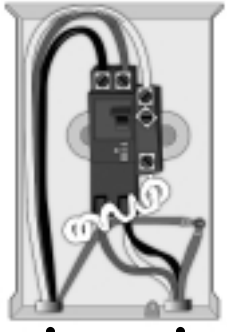
Spa pack terminal block

If the equipment is connected but nothing seems to work, the power supply must be defective. Perform the following:

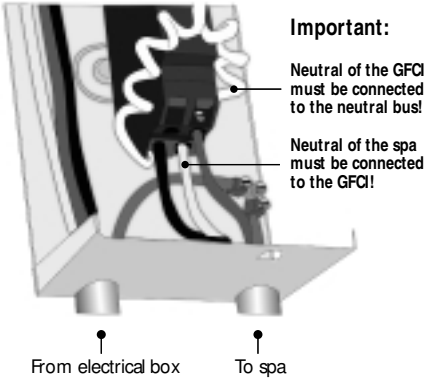
Note that in new installations, GFCI trippings due to mis-wiring are very common.

If the breaker is properly wired, GFCI trippings can occur when the total amount of current drawn by the spa exceeds the rating of the breaker. Such an occurrence, however, is very unlikely since each output of the spa pack is individually fused and fuses will blow before the GFCI trips. A current leak to the ground will also make the GFCI trip. If one of the components is faulty and there is a leak of more than 5 mA, the GFCI will trip to prevent electrocution.

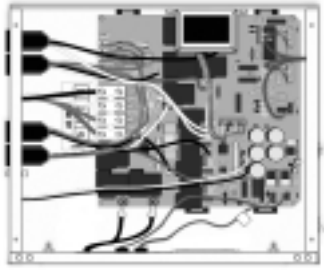
Several different models of GFCIs are available on the market. Note that our illustrations are generic.



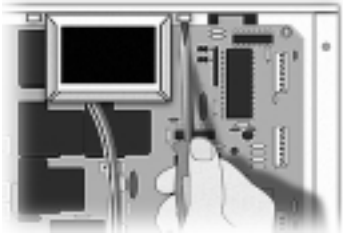
1• Verify if the GFCI is properly connected.



2• If it is not, verify the GFCI wiring diagram and reconnect it.



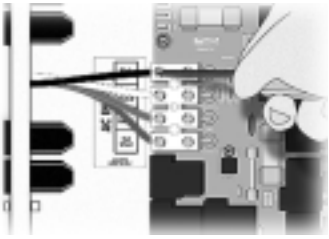
3• If the GFCI is properly connected but still tripping, disconnect all outputs, including the two wires of the heater & the light cord.



4• If it stops tripping, reconnect one component at a time until the GFCI starts tripping.

Replace the defective component.

If the GFCI still trips, perform the following:



1• Disconnect the power input wires.

If the GFCI still trips, the cable must be defective.

Call an electrician!

2• If the GFCI stops tripping, replace it.

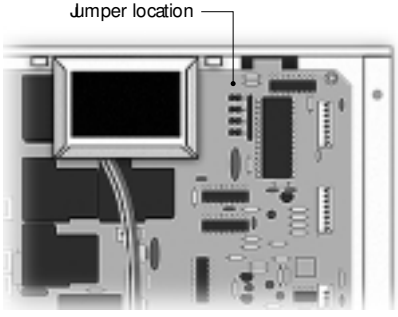
3• If the GFCI is still tripping, replace the board referring to the "How to Replace the Board" section of this manual.

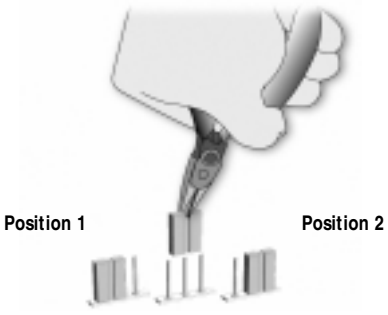
Jumper Setup (MSPA-1-AX)

On the MSPA-1-AX, it is possible to change some parameters of your spa pack by positioning specific jumpers located on the board.

To access the jumpers, remove the plastic cover in your MSPA-1-AX Spa Pack power box as explained in the "How to Replace the Board" section of this manual.

On your system, jumper functions may differ from the following. Check the supplied wiring diagram affixed to the inside of the power box metal cover for your spa pack's specific functions.





1• The jumpers are located on the upper right section of the board.

2• To change a setting, simply pull the jumper out and replace it in the desired position.

Jumper JMP1:	**Temperature display unit**
Position 1 (*):	Temperature will be displayed in degrees Fahrenheit (ºF).
Position 2:	Temperature will be displayed in degrees centigrade [Celsius] (ºC).

Jumper JMP2:	**Blower**
Position 1 (*):	Blower present.
Position 2 :	Blower absent.

* *Gecko factory default setting.*

Low Level Programming

On the MSPA-1-AX2 or AX3, it is possible to change some parameters of your spa pack directly from the top side control by means of the Low Level Programming function.



1• Turn the system down by pressing the **On/Off** key.



2• Press **Up** key for 5 seconds. The currently selected temperature unit is displayed:
F (*) = Degrees Fahrenheit
C = Degrees centigrade



3• Press the **Up** or **Down** key to change the displayed parameter. The setting will be saved automatically.

Blower, pump (**), ozonator (**) and input current mode (**)



1• Turn the system down by pressing the **On/Off** key.



2• Press the **Blower** key for 20 seconds. The "bLx" message is displayed, where "x" is the current blower configuration:
0 = Blower absent
1 = Single-speed blower
2 (*) = Dual-speed blower



3• Press the **Up** or **Down** key to change the displayed setting.



4• Press the **Blower** key to confirm the desired setting and go to the next low level programming parameter (**). The "P1x" message is displayed, where "x" is the current pump configuration:
1 = Single-speed pump 1 & single-speed pump 2
2 (*) = Dual-speed pump 1

5• Press the **Up** or **Down** key to change the displayed setting.

* *Gecko factory default setting.*
** *MSPA-1-AX3 only.*



6• Press the **Blower** key to confirm the desired setting and go to the next low level programming parameter (**). The "03x" message is displayed, where "x" is the current ozonator status:
1 (*) = 30-minute on/off
2 = always on

7• Press the **Up** or **Down** key to change the displayed setting.



8• Press the **Blower** key to confirm the desired setting and go to the next low level programming parameter (**). The "HC" or "LC" message is displayed, indicating the currently set input current mode:
"HC" = High current mode. No current restriction.
"LC" (*) = Low current mode. The heater will not start if pump 1 & pump 2 are running at high speed.

9• Press the **Up** or **Down** key to change the displayed setting.

10• Press the **Blower** key to confirm the desired setting and exit the low level programming mode.

* *Gecko factory default setting.*
** *MSPA-1-AX3 only.*

Keypad lockout



1• To lock the keypad, press the **Light** key for 5 seconds. The "LOC" message is displayed. It is then impossible to shut the system down, to modify the purge cycles nor to set the water temperature.

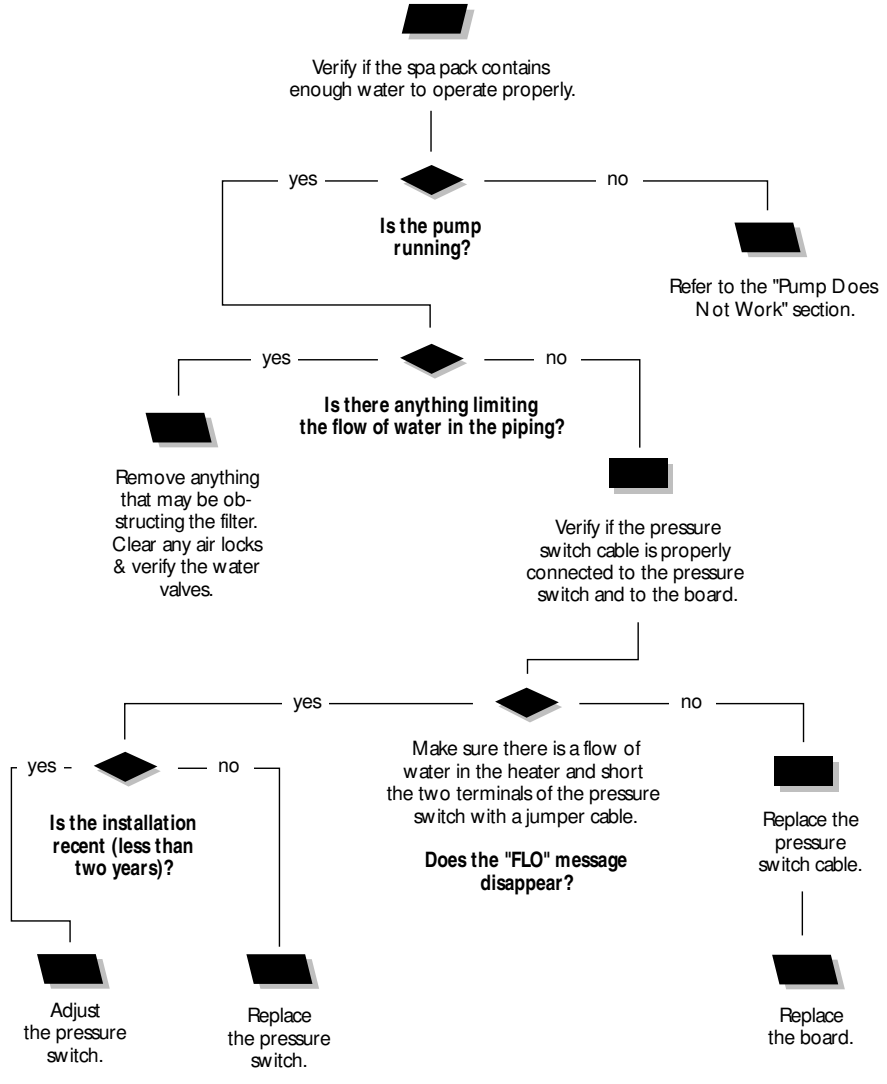


2• To unlock the keypad, press the **Light** key for 5 seconds. The "uLOC" message is displayed as a confirmation. The system returns to normal operating mode.

Notes:

The "FLO" message indicates a problem with the pressure switch. Pump is on but no water pressure is detected. Follow the troubleshooting flow chart below to identify the source of the problem.

Notes: For systems manufactured before 1998, you have to press a key after each step to reset the system.



"FLO" Error Message

The "FLO" error message is displayed when a problem is detected with the pressure switch. The system does not detect any pressure when the pump is (manually or automatically) activated.



For systems manufactured before 1998, the "FLO" message remains displayed until any key is pressed. Press a key after each step to reset the system.

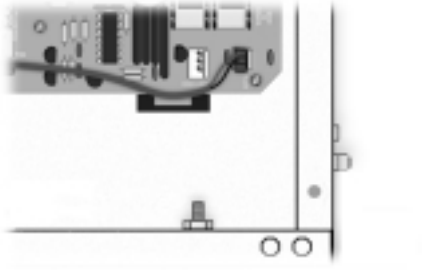
The spa pack must contain enough water to operate properly. The "FLO" message can appear if the spa filter is dirty or if something is limiting the flow of water in the piping.

For systems manufactured from 1998 onward, the heater is automatically turned off whenever the "FLO" message appears. For systems manufactured before 1998, the pump and the heater are turned off whenever the "FLO" message appears.

Power can remain on when the following steps are performed.

1• Verify if the pump (or circulation pump) is running. If the pump is not running properly, refer to the respective section of this manual.

2• Make sure to clean the filter and to look for air locks, closed valves or anything that could limit the flow of water in the piping.



3• Verify if the pressure switch cable is properly connected both to the pressure switch and to the board.

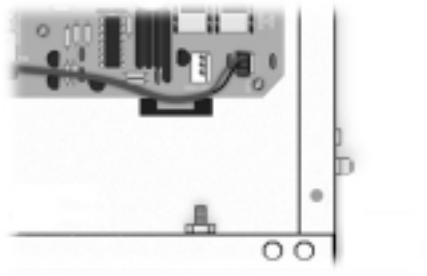
4• Make sure there is a flow of water in the heater and short the two terminals of the pressure switch with a jumper cable.

5• If the "FLO" message disappears:

a- If the installation is older than 2 years, replace the pressure switch and adjust it.

b- If the installation is recent, try to adjust the pressure switch. If this is not possible, replace the switch.

(Refer to the respective section of this manual).



6• If the "FLO" message does not disappear on the display, either the pressure switch cable or the board must be defective.

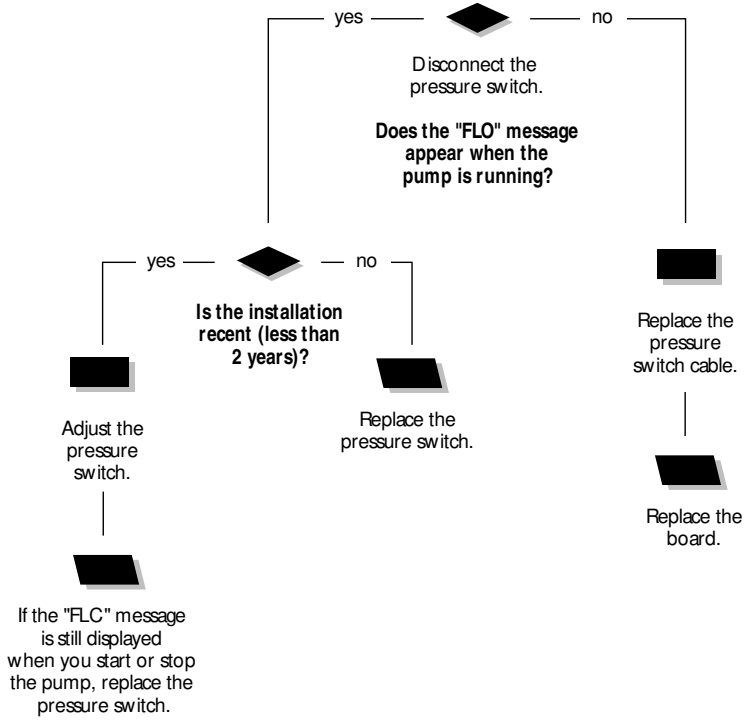
Remove the plastic cover and replace the cable.

7• If the problem persists, replace the board referring to the "How to Replace the Board" section of this manual.

Notes:

The "FLC" message indicates a problem with the pressure switch. Pump is off but water pressure is detected. Follow the troubleshooting flow chart below to identify the source of the problem.

Note: For systems manufactured before 1998, you have to press a key after each step to reset the system.



"FLC" Error Message

The "FLC" error message is displayed when a problem is detected with the pressure switch. The system detects pressure while the pump is not running.



For systems manufactured before 1998, the "FLC" message remains displayed until any key is pressed. Press a key after each step to reset the system.

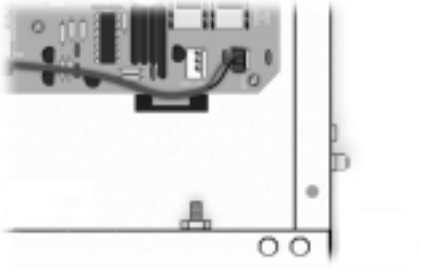
Power can remain on when the following steps are performed.

1• Disconnect the pressure switch.

If the "FLO" message appears when the pump is started, adjust the pressure switch in the case of a recent installation.

If this is not possible, replace the switch.

(Refer to the respective section of this manual).



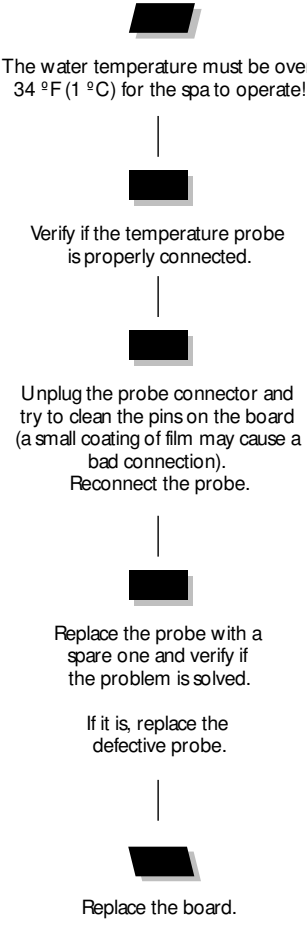
2• If the "FLO" message does not appear, remove the plastic cover and replace the pressure switch cable.

3• If the problem persists, replace the board referring to the "How to Replace the Board" section of this manual.

The "Prr" message indicates a problem with the temperature regulation probe. Follow the troubleshooting flow chart below to identify the source of the problem.

Notes: For systems manufactured from 1998 onward, the "Prr" message is ignored for an hour to allow the water temperature to reach 34 ºF (1 ºC).

Press a key after each step to reset the system!



"Prr" Error Message

The "Prr" error message is displayed when a problem is detected with the temperature regulation probe: the system is constantly verifying if the sensed temperature remains within normal range.

Note: For systems manufactured from 1998 onward, the "Prr" message is ignored for an hour to allow the water temperature to reach 34 ºF (1 ºC).



The water temperature must be over 34 ºF (1ºC) for you to perform the following steps.

Press a key after each step to reset the system.

Power can remain on when the following steps are performed.



1• Remove the plastic cover and verify if the temperature probe (the probe located in the spa) is properly connected to the board.



2• Unplug the probe connector and try to clean the pins on the board using a screwdriver (a small coating of film may cause a bad connection).

3• Reconnect the probe.

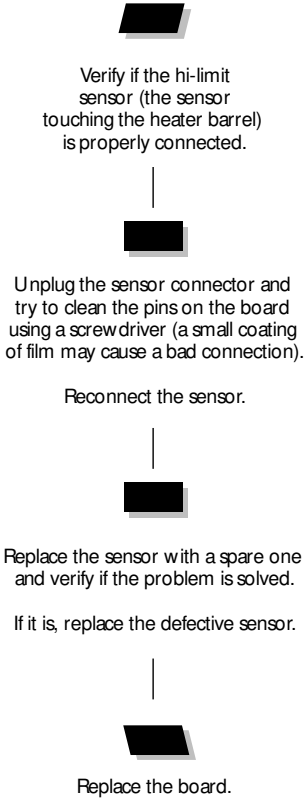
If the "Prr" message is still displayed, replace the probe by a spare one and place its head directly in the spa water.

If the problem is solved, replace the defective probe.

4• If the problem persists, replace the board referring to the "How to Replace the Board" section of this manual.

The "Prh" message indicates a problem with the hi-limit sensor. Follow the troubleshooting flow chart below to identify the source of the problem.

Note: Press a key after each step to reset the system!

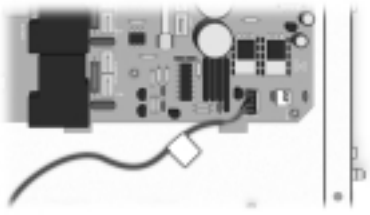


"Prh" Error Message

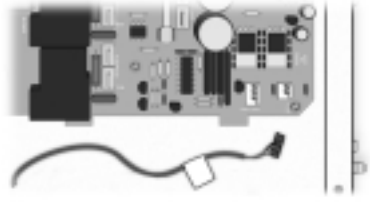
The "Prh" error message is displayed when a problem is detected with the hi-limit sensor: the system is constantly verifying if the sensed temperature remains within normal range.



Press a key after each step to reset the system.



1• Remove the plastic cover and verify if the hi-limit sensor (the sensor touching the heater barrel) is properly connected to the board.



2• Unplug the sensor connector and try to clean the pins on the board using a screwdriver (a small coating of film may cause a bad connection).

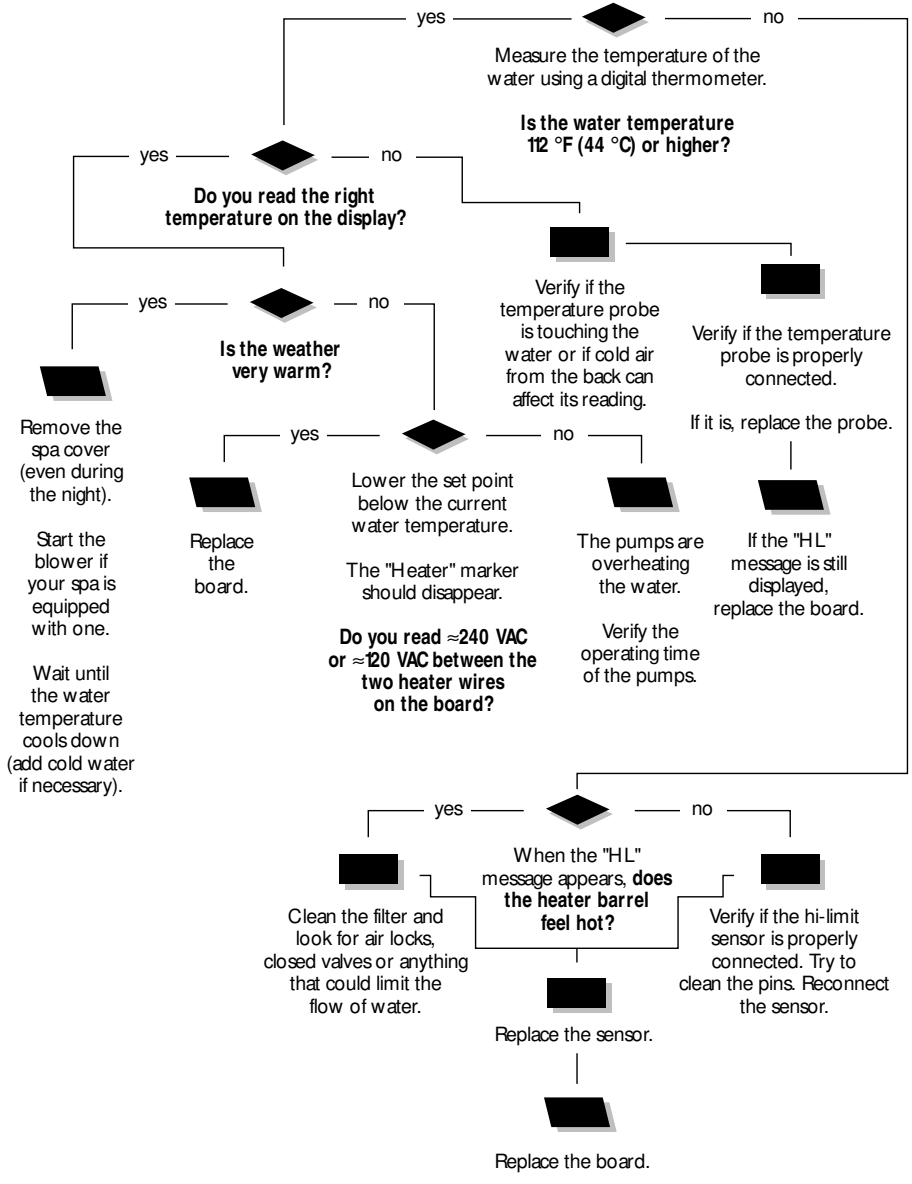
3• Reconnect the sensor.

If the "Prh" message is still displayed, replace the hi-limit sensor by a spare one and verify if the problem is solved.

4• If the problem persists, replace the board referring to the "How to Replace the Board" section of this manual.

The "HL" message indicates a problem with the hi-limit sensor. Follow the troubleshooting flow chart below to identify the source of the problem.

Note: Press a key after each step to reset the system!



"HL" Error Message

The "HL" error message is displayed when a problem is detected with the hi-limit sensor.

Fixed message: *The system has shut down because the temperature at the heater has reached 119 °F (48 °C).*

Blinking message: *For spa packs manufactured from 2000 onward, the system has shut down because the water temperature in the spa has reached 112 °F (44 °C). Only the "Smart Winter Mode" function remains active.*



Press a key after each step to reset the system. Power can remain on when the following steps are performed.

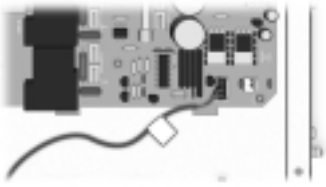
1• With the help of a digital thermometer, measure the temperature of the water.

2• **If the reading is below 112 °F (44 °C); the "HL" message should be fixed (non-blinking):**

a- Verify if the heater barrel feels hot.

If it does, make sure to clean the filter and to look for air locks, closed valves or anything that could limit the flow of water in the piping.

b- If it does not, verify if the hi-limit sensor is properly connected to the board.



Unplug the sensor connector and try to clean the pins on the board using a screwdriver (a small coating of film may cause a bad connection). Then reconnect the sensor.

c- If the "HL" message is still displayed, replace the hi-limit sensor.

d- If the problem persists, replace the board referring to the "How to Replace the Board" section of this manual.

3• **If the reading is 112 °F (44 °C) or higher; the "HL" message should be blinking:**

Go to next page if the right temperature is displayed on the top side control.

Go to page 26 if the top side control does not display the right temperature.

If a digital thermometer reading of the water temperature is 112 °F (44 °C) or higher while the right temperature is displayed on the top side control, proceed as follows:

If the weather is very warm:

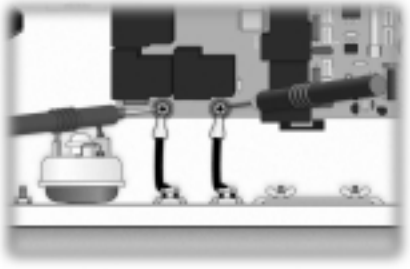
1• Remove the spa cover (even during the night). Start the blower if your spa is equipped with one. Wait until the water temperature cools down (add cold water if necessary).

If the weather is not a factor:



2• Lower the set point below the current water temperature referring to the User manual.

The "Heater" marker should disappear.



3• Remove the plastic cover. Using a multimeter, measure the voltage between the two heater wires on the board.

4• **If you do not read ≈240 VAC or ≈120 VAC**, the water may be overheated by the pumps.



Verify if the pumps are not running for too long.

5• **If you do read ≈240 VAC or ≈120 VAC**, replace the board referring to the "How to Replace the Board" section of this manual.

"HL" Error Message

If a digital thermometer reading of the water temperature is 112 °F (44 °C) or higher while the right temperature is ***not*** *displayed on the top side control, perform the following:*

1• Verify if the temperature probe is in contact with the water or if cold air coming from the back can affect its reading.

   If necessary, use foam to insulate the back of the probe if cold air is the cause of the problem.

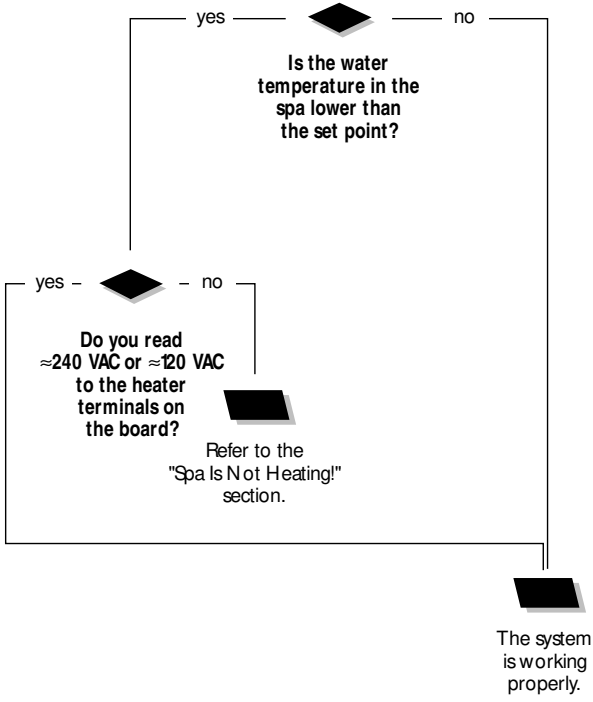


2• Verify if the temperature probe is properly connected to the board.

   If it is, replace the probe.

3• If the "HL" message is still displayed, replace the board referring to the "How to Replace the Board" section of this manual.

The "FrE" message indicates that the system detected the possibility for water to freeze in the piping. Follow the troubleshooting flow chart below to identify the source of the problem.



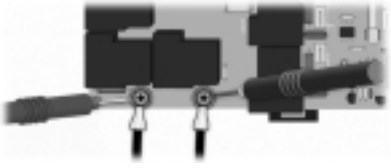
"FrE" Error Message

The "FrE" error message is related to the freeze protection of the system. (The system automatically enters the anti-freeze protection mode)



Power can remain on when performing the following steps.

1• With the help of a digital thermometer, measure the temperature of the water.



2• If the water temperature is lower than the desired temperature (or "set point"), remove the plastic cover and measure the voltage to the heater.

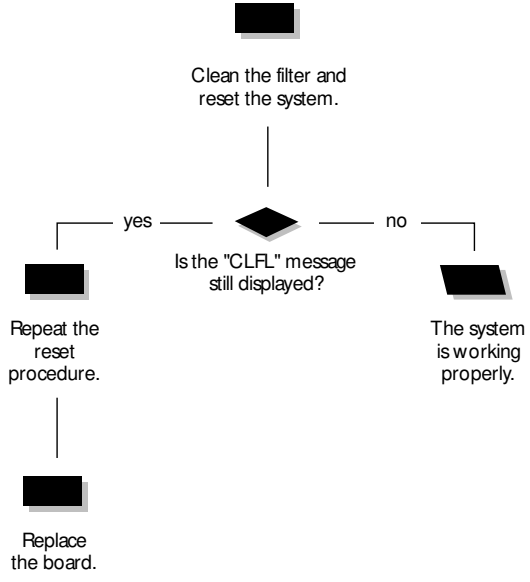
If you read ≈240 VAC or ≈120 VAC, the freeze protection of the system is working properly.

If you do not read ≈240 VAC or ≈120 VAC, refer to the "Spa Is Not Heating!" section of this manual.

The "CLFL" message indicates that the spa filter needs to be cleaned. Follow the troubleshooting flow chart below.

Notes: This function only applies to systems manufactured from 1998 onward.

The system counts the number of days of operation of the spa and displays the "CLFL" message after 14 days.



"CLFL" Error Message

The "CLFL" message is displayed when the system detects that the spa filter needs to be cleaned (after 14 days of operation).

Note: This function only applies to systems manufactured from 1998 onward.



To cancel the "CLFL" message and reset the counter:

1• Clean the filter.

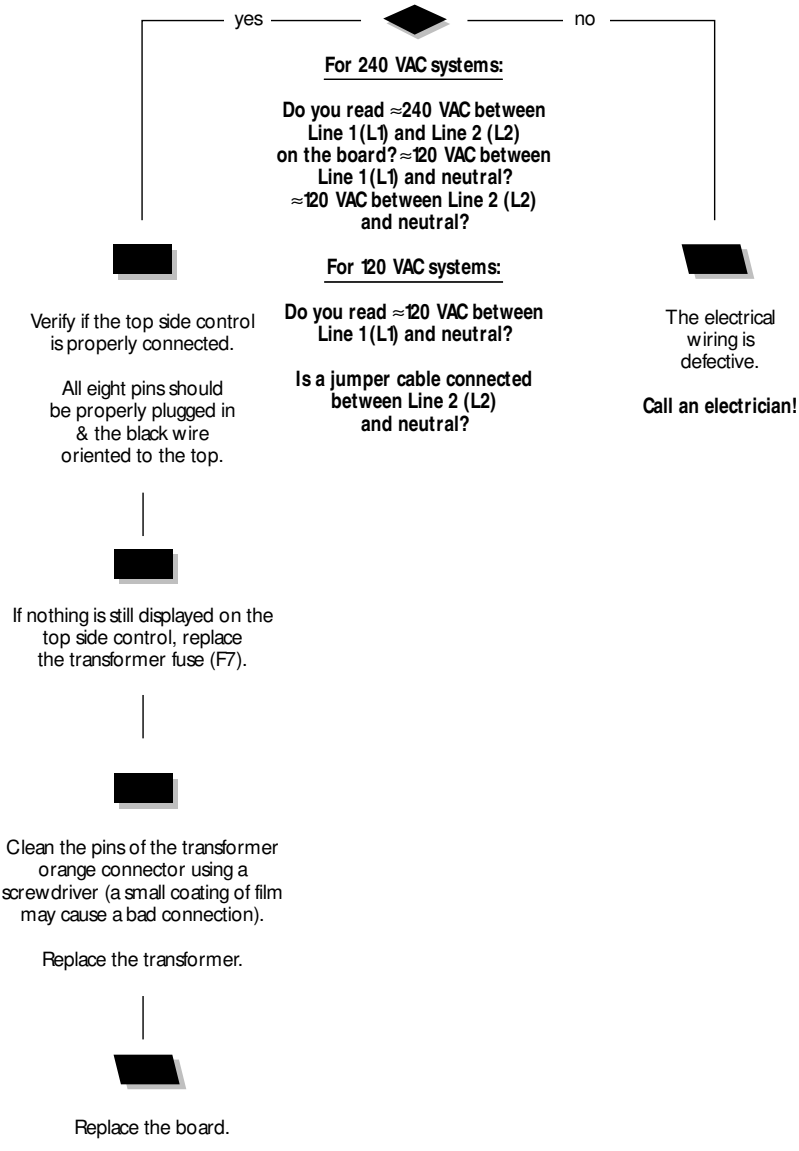


2• Shut the system down by pressing the **On/Off** key.



3• Press the **Filter** key for 5 seconds. The display shows the "rSFL" message to confirm that the counter has been successfully reset.

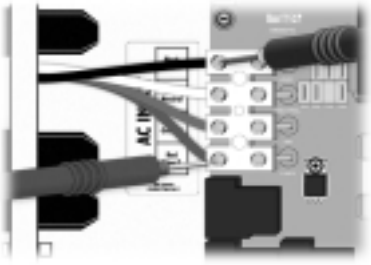
If nothing seems to work, follow the troubleshooting flow chart below to identify the source of the problem.



Nothing Works!

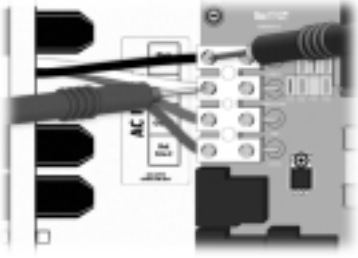
If the equipment is connected but nothing seems to work, the power supply must be defective. Refer to the "Power & Ground Check" section of this manual. If required, proceed as follows:

For 240 VAC systems:



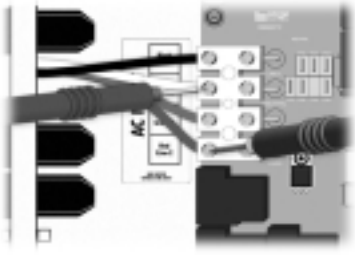
1• On the power supply terminal block, measure the voltage between Line 1 (L1) and Line 2 (L2). If necessary, refer to the supplied wiring diagram!

You should read ≈240 VAC.



2• Measure the voltage between Line 1 (L1) and neutral.

You should read ≈120 VAC.



3• Measure the voltage between Line 2 (L2) and neutral.

You should read ≈120 VAC.

4• If you do not get good readings, the electrical wiring must be defective.

Call an electrician!

For 120 VAC:

1• Measure the voltage between Line 1 (L1) and neutral.

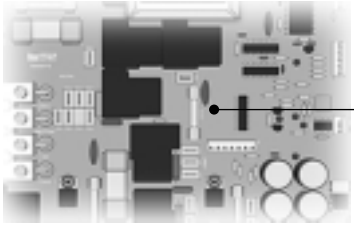
You should read ≈120 VAC.

2• Verify if Line 2 (L2) and neutral are connected by a jumper cable.

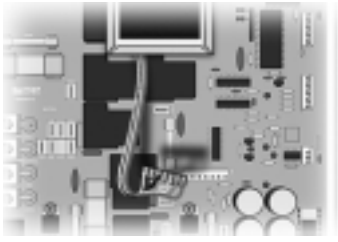
If voltage readings are correct but nothing seems to work, proceed as follows:



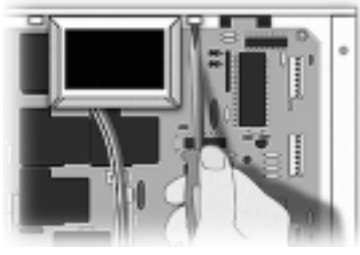
1• Verify if the top side control is properly connected to the board.



2• If the problem persists, replace the transformer fuse (F7).



3• If the problem still persists, clean the pins of the transformer orange connector using a screwdriver (a small coating of film may cause a bad connection).



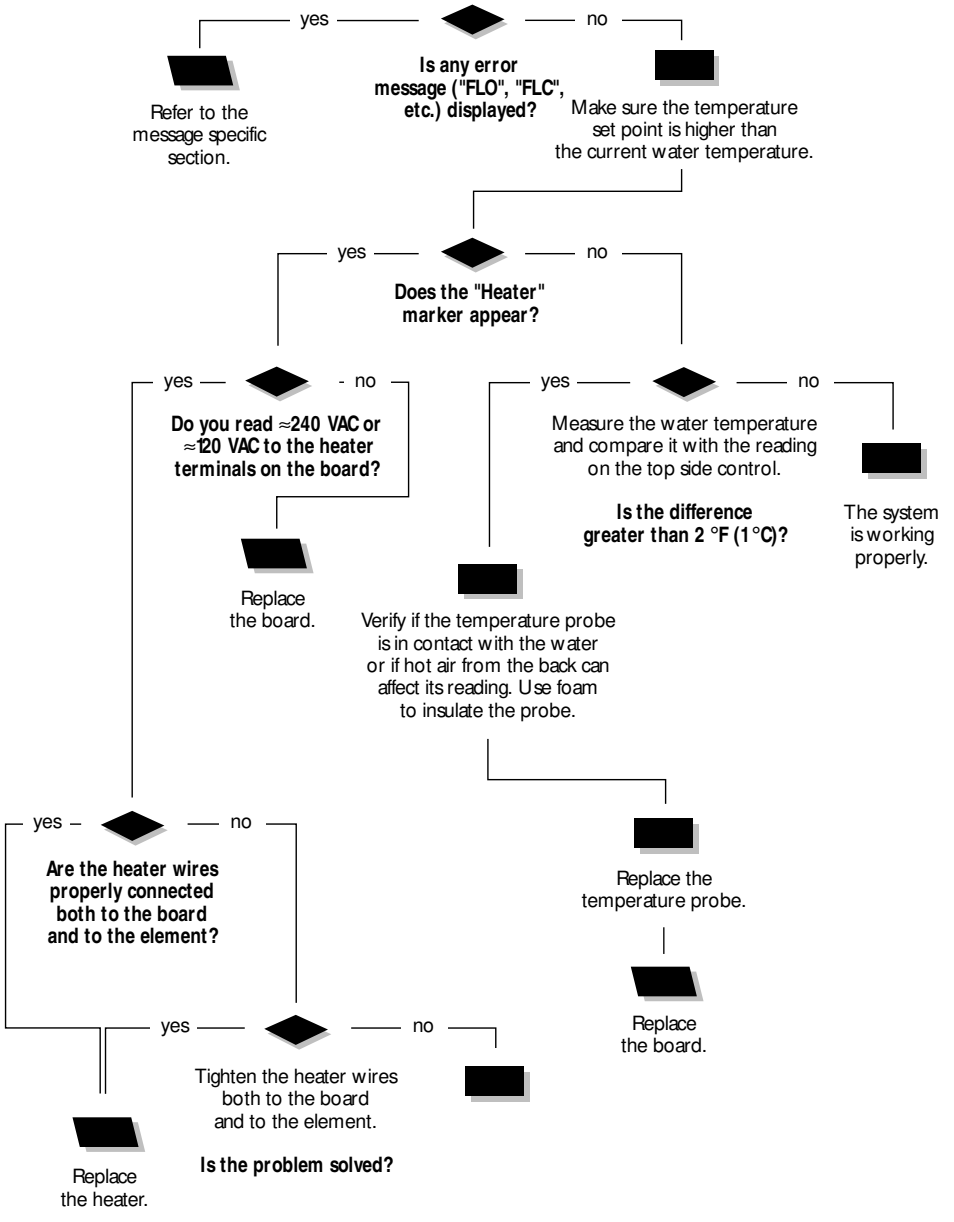
4• If the system still does not work, replace the transformer.

5• If the problem is not solved yet, replace the board referring to the "How to Replace the Board" section of this manual.

Notes:

"Spa Is Not Heating!" Flow Chart

If the system does not seem to be heating the water, follow the troubleshooting flow chart below to identify the source of the problem.



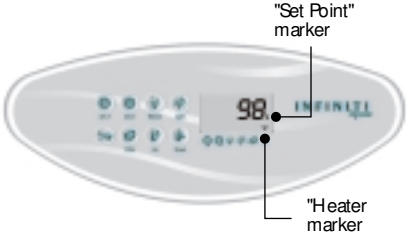
Spa Is Not Heating!

If the system does not seem to be heating the water, proceed as follows:

1• Verify if an error message is displayed on the top side control. If so, refer to the message specific section of this manual.



2• If not, verify if you can call for heat by increasing the temperature set point (refer to the User manual).



3• Verify if the "Heater" marker appears on the top side control.

The "Heater" marker is displayed (fixed) when the heater is on. It flashes when there is a call for heat but the heater has not started yet.

If the "Heater" marker does not appear:

4• With the help of a digital thermometer, measure the temperature of the water and compare it with the reading on the top side control.

If the two values differ by more than 2 °F (1 °C), verify if the temperature probe is in contact with the water or if hot air coming from the back can affect its reading.

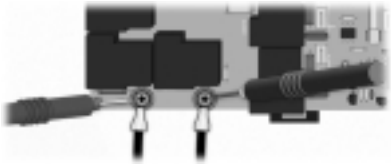


5• If so, use foam to insulate the back of the probe.

6• If not, replace the temperature probe by a spare one.

7• If the problem still persists, replace the board referring to the "How to Replace the Board" section of this manual.

If the "Heater" marker appears but the spa is still not heating, proceed as follows:



3• Measure the voltage to the heater terminals on the board.

Note: If necessary, refer to the supplied wiring diagram!

If you do not read ≈240 VAC or ≈120 VAC, replace the board.

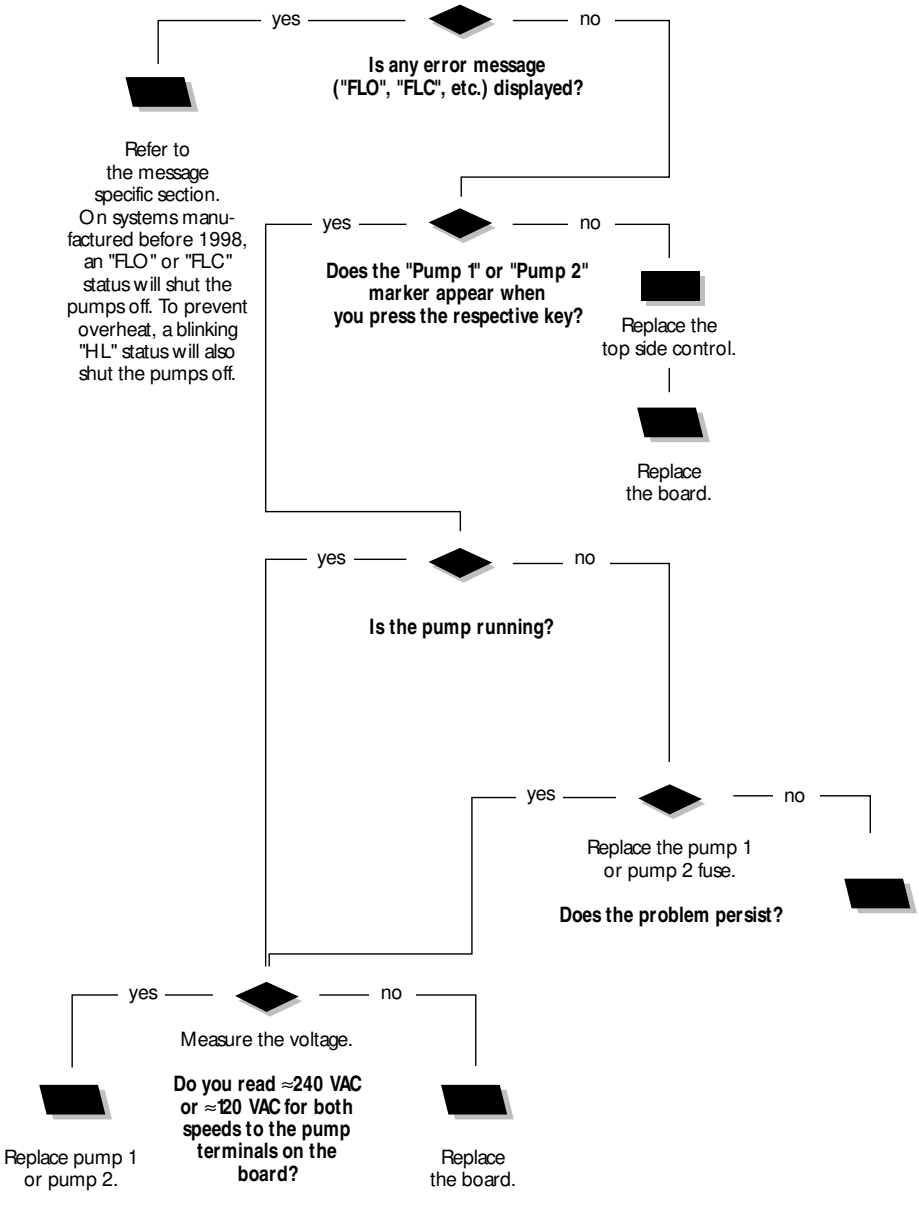
4• If the voltage reading is correct, verify if the two heater wires are properly connected both to the board and to the element.

If necessary, tighten the connections.

5• If the problem persists, replace the heater.

Notes:

If pump 1 or pump 2 does not work, follow the troubleshooting flow chart below to identify the source of the problem.



Pump 1 Does Not Work!

If pump 1 does not work, proceed as follows:

To increase the lifetime of the relay, a circuit called "snubber" is used on the pump relay. With this type of circuit, if no pump is connected to an output and the relays are open, the multimeter will still read voltage of around 60 V. This is normal.

It is important to measure voltage when the pump is powered on!





1• Verify if an error message is displayed on the top side control. If so, refer to the message specific section of this manual. On systems manufactured before 1998, an "FLO" or "FLC" status will shut the pumps off. To prevent overheat, a blinking "HL" status will also shut the pumps off.

2• Verify if the "Pump 1" marker appears when you press the respective key.

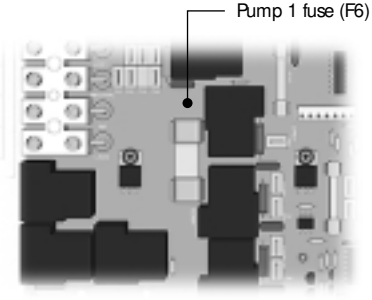
3• If the "Pump 1" marker does not appear, use a spare top side control to see if the first is defective.

In the latter case, replace the defective top side control.

If the original top side control is not defective, replace the board referring to the "How to Replace the Board" section of this manual.

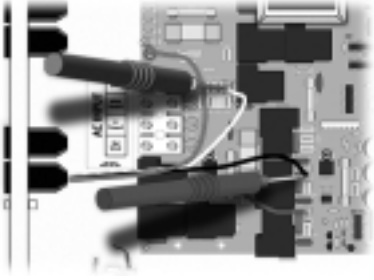
Pump 1 Does Not Work!

If pump 1 does not work but the "Pump 1" marker appears, proceed as follows:



1• Replace the pump 1 fuse (F6).

2• If replacing the fuse is not effective, measure the voltage on the board as explained below:



Start pump 1 and measure the voltage between the white and black wire terminals on the board (P16 & P24 for a 240 VAC pump, P16 & P20 for a 120 VAC pump).

You should read ≈240 VAC or ≈120 VAC respectively.

Note : If necessary, refer to the supplied wiring diagram!

3• If the voltage reading is correct, replace pump 1.

4• If the voltage reading is not correct, replace the board referring to the respective section of this manual.

Pump 2 Does Not Work!

If pump 2 does not work, proceed as follows:

To increase the lifetime of the relay, a circuit called "snubber" is used on the pump relay. With this type of circuit, if no pump is connected to an output and the relays are open, the multimeter will still read voltage of around 60 V. This is normal.

It is important to measure voltage when the pump is powered on!





1• Verify if an error message is displayed on the top side control. If so, refer to the message specific section of this manual. To prevent overheat, a blinking "HL" status will shut pump 2 off.

2• Verify if the "Pump 2" marker appears when you press the respective key.

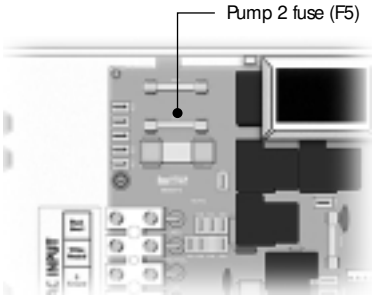
3• If the "Pump 2" marker does not appear, use a spare top side control to see if the first is defective.

In the latter case, replace the defective top side control.

If the original top side control is not defective, replace the board referring to the "How to Replace the Board" section of this manual.

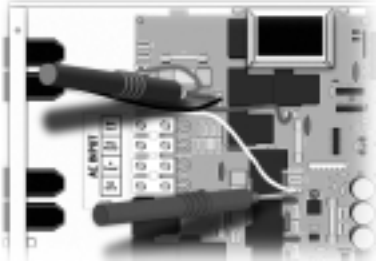
Pump 2 Does Not Work!

If pump 2 does not work but the "Pump 2" marker appears, proceed as follows:



1• Replace the pump 2 fuse (F5).

2• If replacing the fuse is not effective, measure the voltage on the board as explained below:



Start pump 2 and measure the voltage between the white and black wire terminals on the board (P15 & P22 for a 240 VAC pump, P15 & P18 for a 120 VAC pump).

You should read ≈240 VAC or ≈120 VAC respectively.

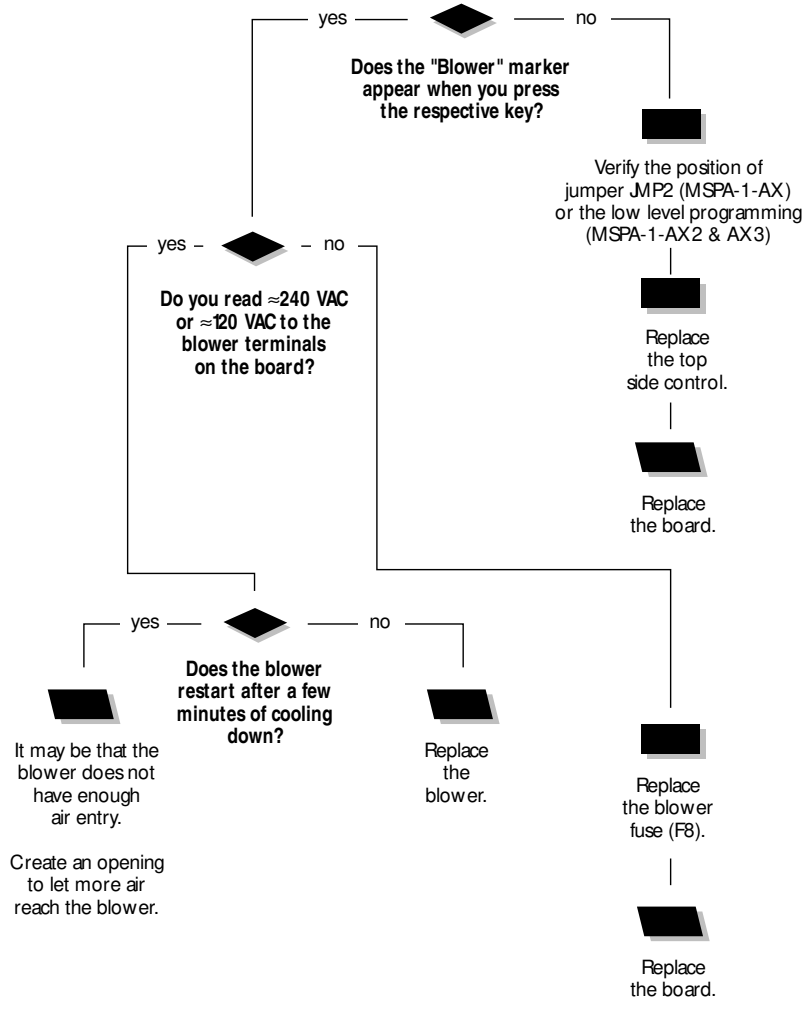
Note: If necessary, refer to the supplied wiring diagram!

3• If the voltage reading is correct, replace pump 2.

4• If the voltage reading is not correct, replace the board referring to the respective section of this manual.

Notes:

If the blower does not work, follow the troubleshooting flow chart below to identify the source of the problem.

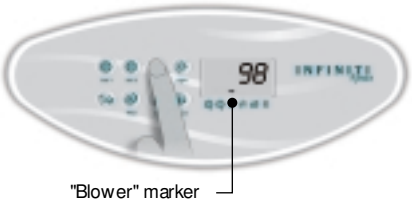


Blower Does Not Work!

If the blower does not work, proceed as follows:

To increase the lifetime of the relay, a circuit called "snubber" is used on the blower relay. With this type of circuit, if no blower is connected to an output and the relays are open, the multimeter will still read voltage of around 60 V. This is normal.

It is important to measure voltage when the blower is powered on!



1• Verify if the "Blower" marker appears when you press the respective key.



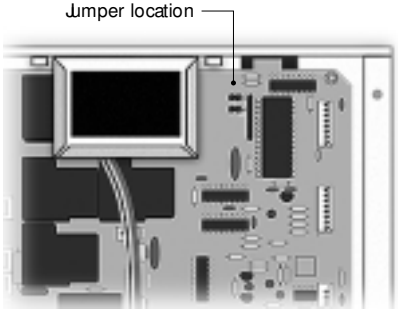
2• If the "Blower" marker does not appear, use a spare top side control to see if the first is defective.

In the latter case, replace the defective top side control.

If the original top side control is not defective, replace the board referring to the "How to Replace the Board" section of this manual.

3• If the "Blower" marker appears when you press the respective key, verify if the blower is running.

MSPA-1-AX :
Verify if the blower is properly configured with jumper JMP2.

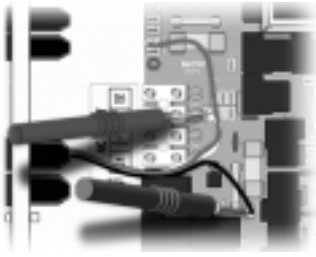


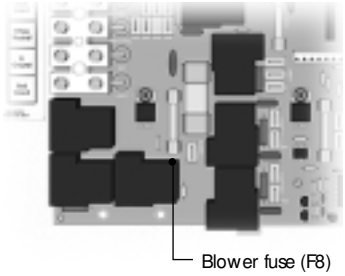
MSPA-AX2 & AX3 :
Verify if the blower is properly configured in the low level programming.

Refer to the respective section of this manual.

4• If the problem persists, replace the board.

If the blower does not work but the "Blower" marker appears, proceed as follows:





1• If the "Blower" marker appears when the blower is running, measure the voltage between the white and black wire terminals on the board (P25 & P29 for a 240 VAC blower, P21 & P29 for a 120 VAC blower).

You should read ≈240 VAC or ≈120 VAC respectively.

Note: If necessary, refer to the supplied wiring diagram!

2• If the voltage reading is not correct, replace the blower fuse (F8).

3• If the voltage reading still is not correct, replace the board.

4• If the voltage reading is satisfactory, verify if you can restart the blower a few minutes after it was shut down.

If the blower does not restart after cooling down, replace it.

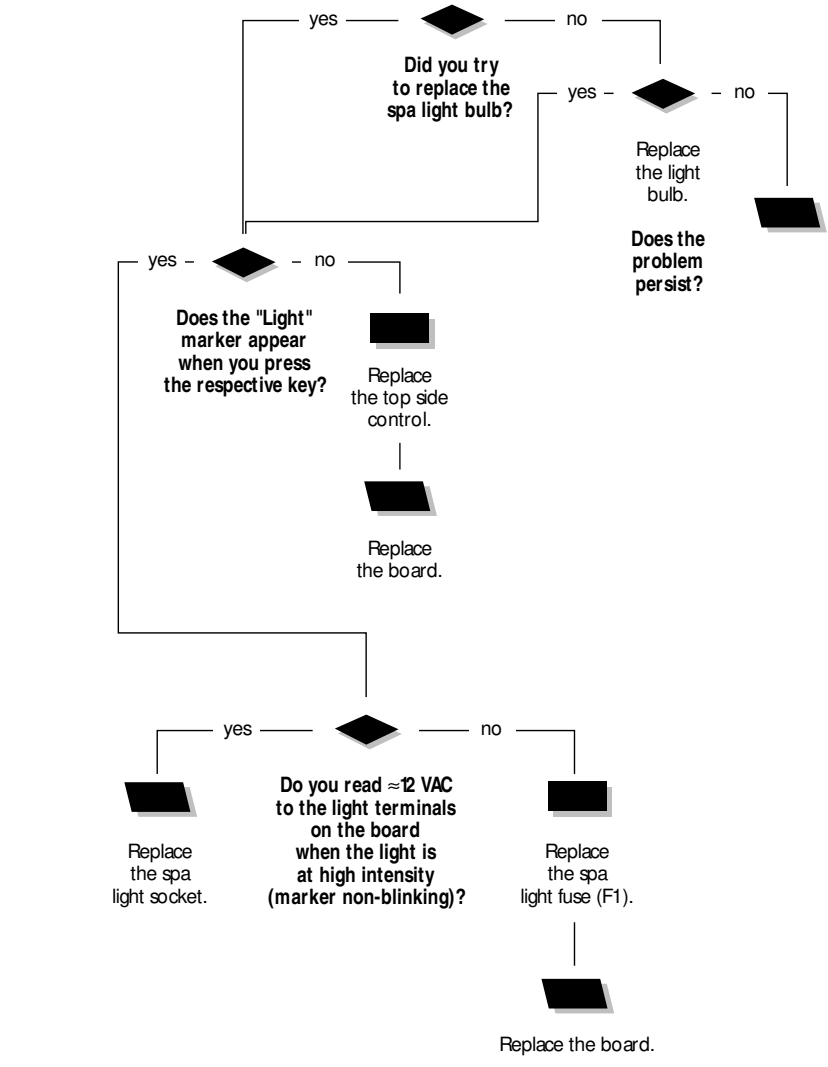
5• If the blower does restart after cooling down, it may be that the blower does not draw enough air.

6• If so, create a bigger opening to let more air reach the blower.

Notes:

Spa Light Flow Chart

If the spa light does not work, follow the troubleshooting flow chart below to identify the source of the problem.



Spa Light Does Not Work!

If the spa light does not work, proceed as follows:

For systems manufactured before 2000, the "Light" key will activate the fiber-optic box instead of the regular 12 V spa light when an EXM-5 module is plugged to the AUX connector.

It is important to measure voltage when the spa light is powered on!

1• Verify the spa light bulb and replace it if necessary.



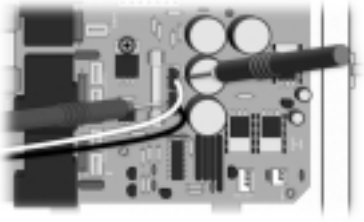
2• If the spa light still does not work, verify if the "Light" marker appears when you press the respective key.



3• If the "Light" marker does not appear, use a spare top side control to verify if the first is defective.

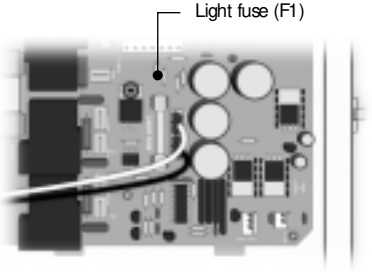
In the latter case, replace the defective top side control.

If the original top side control is not defective, replace the board referring to the "How to Replace the Board" section of this manual.



4• If the "Light" marker does appear but the spa light still does not work, make sure the light is set at high intensity (marker non-blinking), remove the plastic cover and measure the voltage between the light terminals (P9 & P10 on the board).

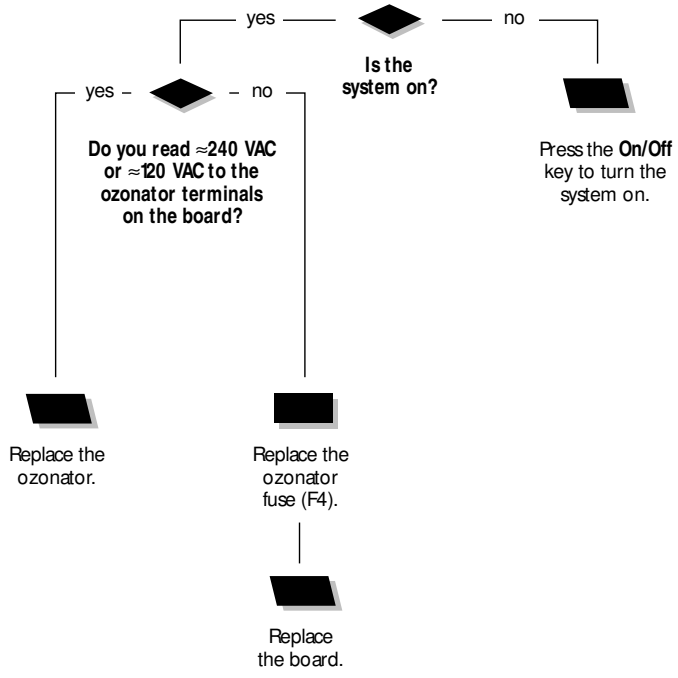
If you read ≈12 VAC, replace the spa light socket.



5• If the voltage reading is not correct, replace the light fuse (F1) on the board.

6• If the problem persists, replace the board referring to the respective section of this manual.

If the ozonator does not work, follow the troubleshooting flow chart below to identify the source of the problem.

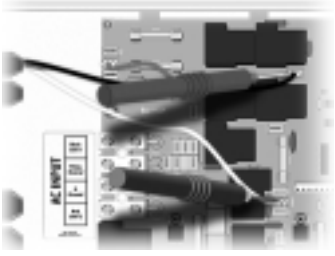


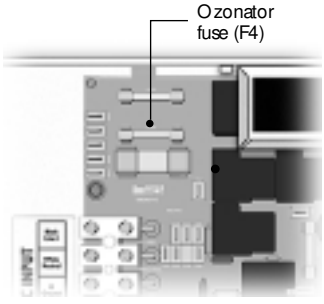
Ozonator Does Not Work!

If the ozonator does not work, proceed as follows:

To increase the lifetime of the relay, a circuit called "snubber" is used on the ozonator relay. With this type of circuit, if no ozonator is connected to an output and the relays are open, the multimeter will still read voltage of around 60 V. This is normal.

It is important to measure voltage when the ozonator is powered on!





1• Measure the voltage between the white and black wire terminals on the board (P16 & P23 for a 240 VAC ozonator, P11 & P19 for a 120 VAC ozonator).

You should read ≈240 VAC or ≈120 VAC respectively.

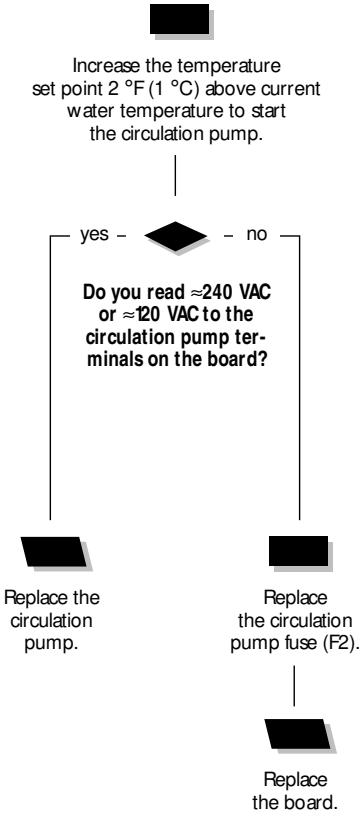
Note: If necessary, refer to the supplied wiring diagram!

2• If the voltage reading is correct, replace the ozonator.

3• If the voltage reading is not correct, replace the ozonator fuse (F4).

4• If the problem persists, replace the board referring to the respective section of this manual.

If the circulation pump does not work, follow the troubleshooting flow chart below to identify the source of the problem.



Circulation Pump Does Not Work!

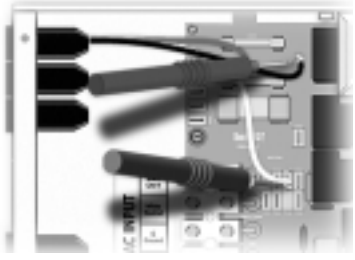
If the circulation pump does not work, proceed as follows:

To increase the lifetime of the relay, a circuit called "snubber" is used on the circulation pump relay. With this type of circuit, if no circulation pump is connected to an output and the relays are open, the multimeter will still read voltage of around 60 V. This is normal.

It is important to measure voltage when the circulation pump is powered on!



1• Start the circulation pump by increasing the water temperature set point at least 2 °F (1 °C) above the current water temperature.

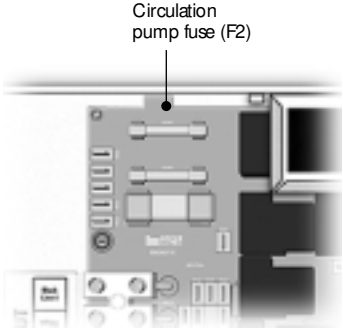


2• Measure the voltage between the white and black wire terminals on the board (P14 & P26 for a 240 VAC circulation pump, P14 & P17 for a 120 VAC circulation pump).

You should read ≈240 VAC or ≈120 VAC respectively.

Note: If necessary, refer to the supplied wiring diagram!

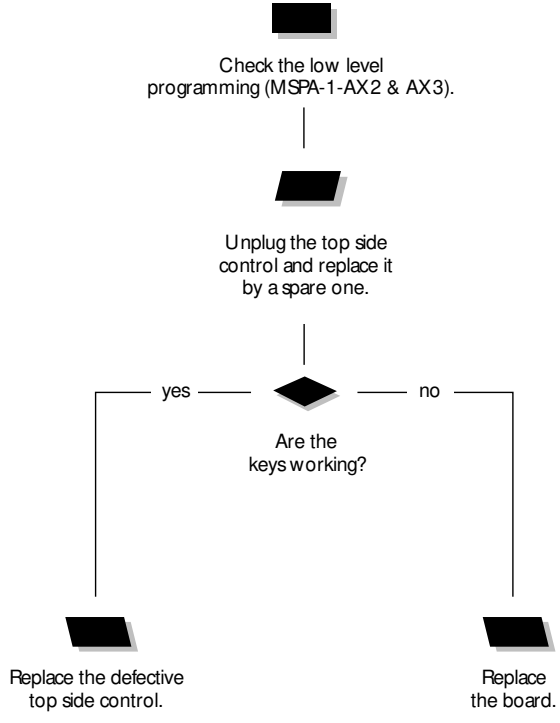
3• If the voltage reading is correct, replace the circulation pump.



4• If the voltage reading is not correct, replace the circulation pump fuse (F2).

5• If the voltage reading is still not correct, replace the board referring to the respective section of this manual.

If one of the keys does not work, follow the troubleshooting flow chart below to identify the source of the problem.



Keys Do Not Work!

If one of the keys on the top side control does not work, proceed as follows:

1• Verify the blower configuration in the low level programming (MSPA-1-AX2 & AX3) referring to the respective section of this manual.



2• Replace the top side control by a spare one.

3• Verify if all keys respond.

4• If they do, replace the defective top side control.

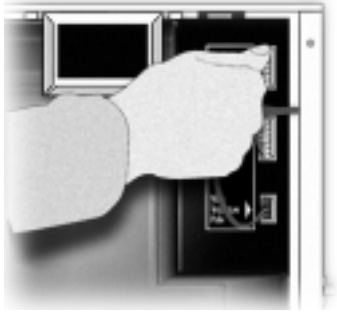
5• If they do not, replace the board referring to the "How to Replace the Board" section of this manual.

To replace the board, proceed as follows:

Before you replace the board, make sure the equipment is powered off!



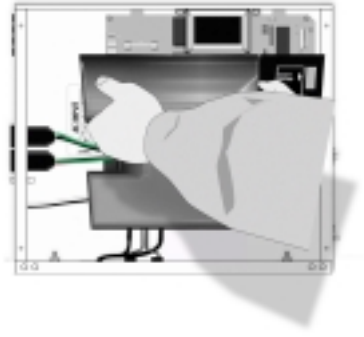
1• Remove your spa pack's power box cover and disconnect the power input wires (located to the left of the board).



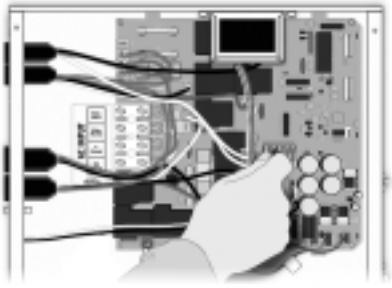
2• Disconnect the top side control(s) and the temperature probe (connectors located in the upper right corner of the board).



3• Insert the end of a flat screwdriver into the slots at the top of the plastic cover.



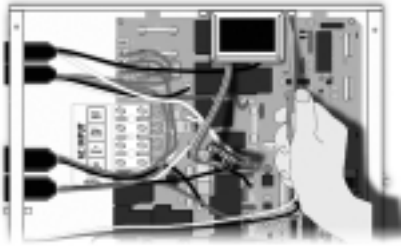
4• Gently remove the plastic cover by releasing its upper part first.



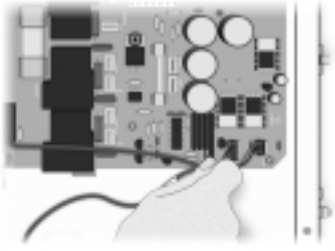
5• Disconnect the transformer.



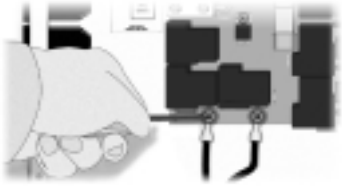
7• Disconnect all outputs (pumps, spa light, ozonator) using a pair of pliers. Make sure not to damage the connectors!



6• Using a nut driver, remove the transformer.



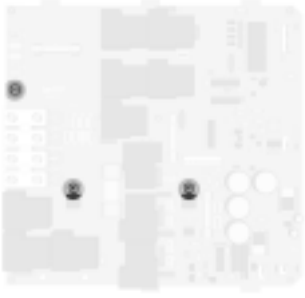
8• Disconnect the hi-limit sensor and the pressure switch.



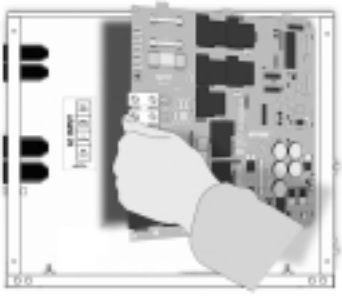
9• Disconnect the heater by loosening the two screws P27 & P28 at the bottom of the board.



11• The board is held in place by means of six plastic standoffs (*). Release these gently using a pair of pliers.



10• Loosen the two triac screws while holding them with a pair of pliers to prevent damage, then remove the ground screw.

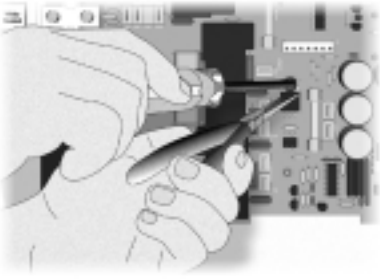


12• Gently remove the board by releasing its left part first.

* *On models manufactured before 1998, loosen the 6 screws.*

13• Verify if the plastic standoffs are damaged. If they are, replace them.

14• Align the new board with the plastic standoffs and snap it into place.



15• Reinstall the two triac screws while holding them with a pair of pliers to prevent damage.

Do not overtighten!

16• Reinstall the ground screw on the board.

17• Reconnect all outputs (pumps, spa light, ozonator) using a pair of pliers. Make sure not to damage the connectors! Refer to the wiring diagram affixed to the inside of your spa pack's power box cover. **This diagram always prevails over the wiring diagram at the end of this manual!**

18• Reconnect the heater.

19• Reconnect the hi-limit sensor and the pressure switch.

20• Reconnect the transformer.

21• Verify all connections, then reinstall the plastic cover placing its lower part first.

22• Reconnect the top side control(s) and the temperature probe.

23• Reconnect the power input wires, close the cover, power the equipment on and proceed with a general test of your spa pack.

To adjust the pressure switch, proceed as follows:



For systems manufactured from 1998 onward:

1• Turn the pump to low speed.

2• Using a flat screwdriver, increase the pressure switch setting to 4 P.S.I. or until the "FLO" error message appears on the top side control.

3• Start decreasing the setting of the pressure switch by turning the adjusting screw counter-clockwise very slowly until the "FLO" message disappears. Then, decrease by another 1/4 of a turn.

4• Run the pump at high speed for 30 seconds. You should **not** see an "FLO" message.

5• Turn the pump off and wait 30 seconds. You should **not** see an "FLC" message.

6• Run the pump at low speed for 30 seconds. You should **not** see an "FLO" message.

7• If you see an "FLO" or an "FLC" message, repeat the procedure above.

If you are not able to adjust the pressure switch, replace it.



For systems manufactured before 1998:

These systems are programmed with software that automatically shuts the pump off whenever an "FLO" message appears.

In this case, you have to press a key (any key) to reset the system.

The procedure for adjusting the pressure switch is the same, except that you have to decrease the setting half a turn at a time.

1• Decrease the setting by 1/2 turn.

2• Press any key and wait 5 seconds.

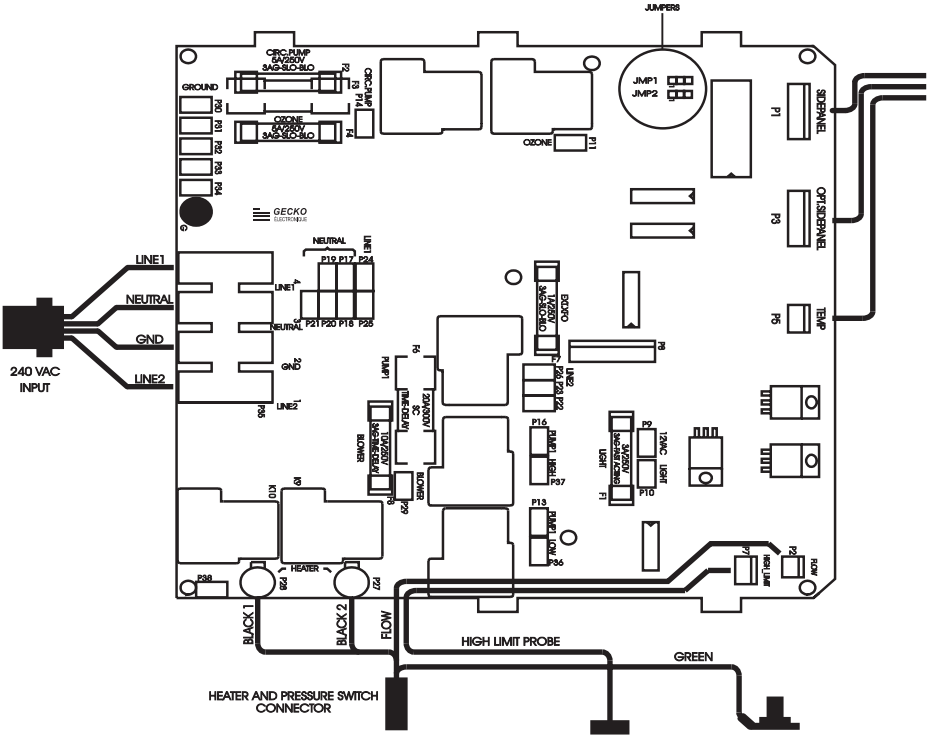
If the setting is too high, an "FLO" message is displayed and the pump is shut off.

3• Repeat the procedure above until the "FLO" message does not reappear.

Notes:

Always refer to the wiring diagram affixed to the inside of your spa pack's power box cover as main reference!

Year: 1997; model: LSB; pack: MSPA-1-AX.



Pump 1		
Voltage	120 V	240 V
Green / Ground	P34	P34
Red / Low Speed	P13	P13
Black / High Speed	P16	P16
White / Neutral-Com	P20	P24

Blower		
Voltage	120 V	240 V
Green / Ground	P33	P33
Black / High Speed	P29	P29
White / Neutral-Com	P21	P25

Circulation Pump		
Voltage	120 V	240 V
Green / Ground	P30	P30
Black / Line	P14	P14
White / Neutral-Com	P17	P26

Ozonator		
Voltage	120 V	240 V
Green / Ground	P31	P31
Black / Line	P11	P11
White / Neutral-Com	P19	P23

Light Connector	
White / 0 VAC	P9
Black / 12 VAC	P10

Heater & Pressure Switch	
Black 1	P28
Black 2	P27
Green / Ground	Ground
(Green & Red)	Pressure switch connector P2

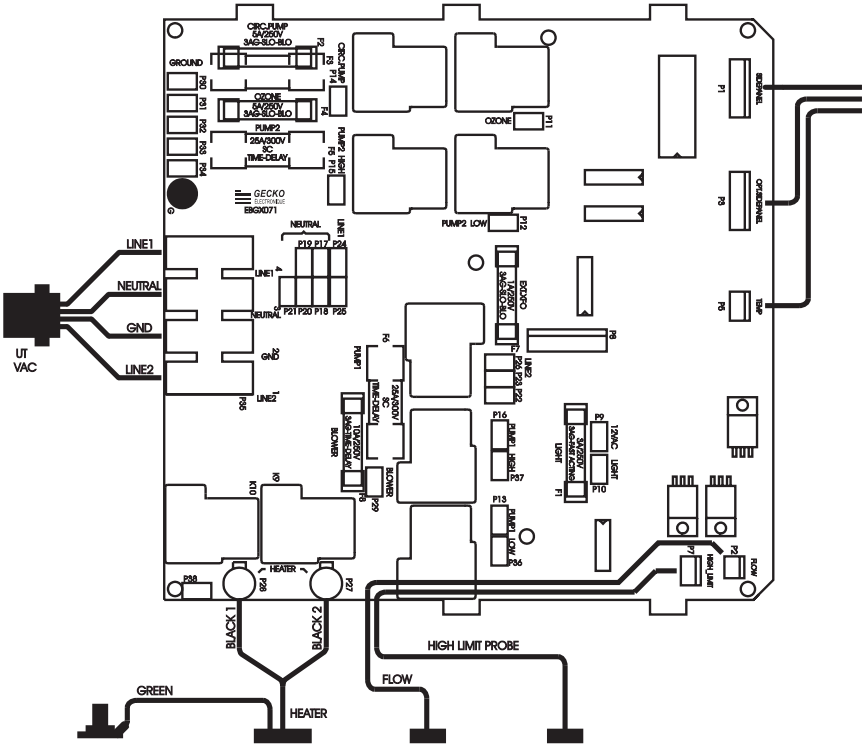
Jumper Setup

Refer to Jumper section

Wiring Diagram (1998)

Always refer to the wiring diagram affixed to the inside of your spa pack's power box cover as main reference!

Year: 1998; model: LS2B (also 1997 LS2B U.S.); pack: MSPA-1-AX2 (3-pin jet pump receptacles).



Pump 1		
Voltage	120 V	240 V
Green / Ground	P34	P34
Black / High Speed	P16	P16
White / Neutral-Com	P20	P24

Blower		
Voltage	120 V	240 V
Green / Ground	P33	P33
Black / Line	P29	P29
White / Neutral-Com	P21	P25

Circulation Pump		
Voltage	120 V	240 V
Green / Ground	P30	P30
Black / Line	P14	P14
White / Neutral-Com	P17	P26

Pump 2		
Voltage	120 V	240 V
Green / Ground	P32	P32
Black / High Speed	P15	P15
White / Neutral-Com	P18	P22

Ozonator		
Voltage	120 V	240 V
Green / Ground	P31	P31
Black / Line	P11	P11
White / Neutral-Com	P19	P23

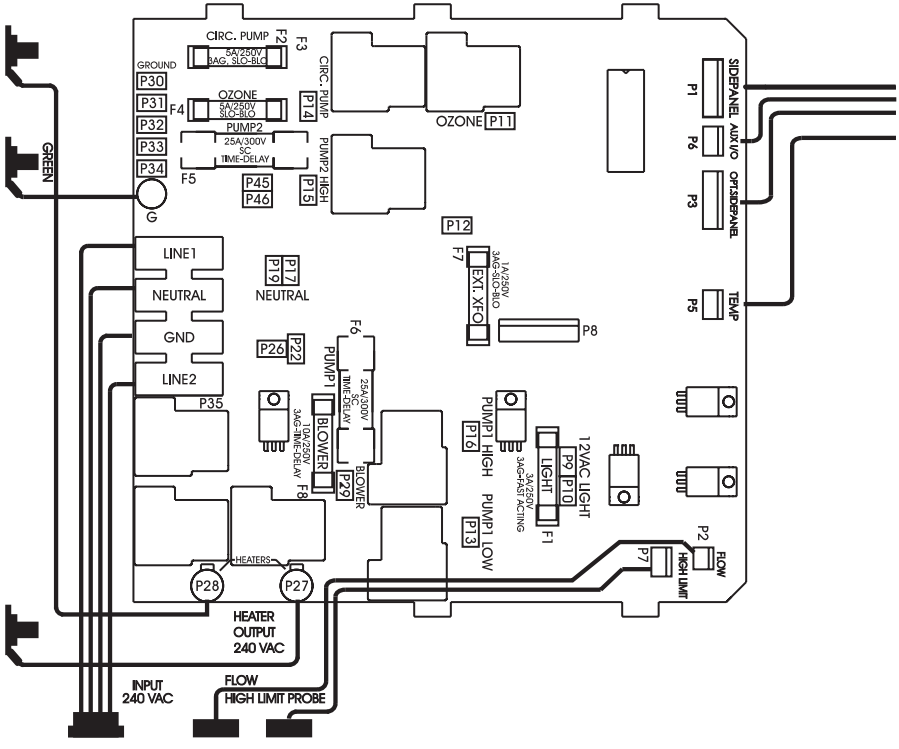
Light Connector	
White / 0 VAC	P9
Black / 12 VAC	P10

Jumper Setup

Refer to Jumper section

Always refer to the wiring diagram affixed to the inside of your spa pack's power box cover as main reference!

Year: 1999; model: LS2B (early model year production); pack: MSPA-1-AX2 (4-pin jet pump receptacles).



Pump 1	
Voltage	240 V
Green / Ground	P34
Black / High Speed	P16
White / Com	P24

Blower	
Voltage	240 V
Green / Ground	P33
Black / Line	P29
White / Com	P25

Circulation Pump	
Voltage	240 V
Green / Ground	P30
Black / Line	P14
White / Com	P26

Pump 2	
Voltage	240 V
Green / Ground	P32
Black / High Speed	P15
White / Com	P22

Ozone	
Voltage	120 V
Green / Ground	P31
Black / Line	P11
White / Neutral	P19

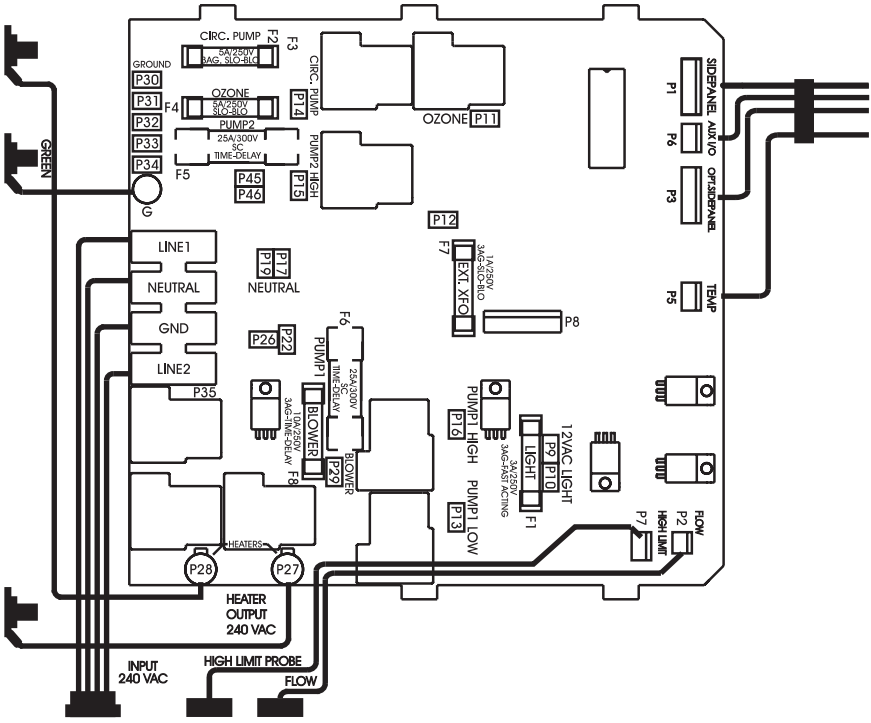
Light Connector	
White / 0 VAC	P9
Black / 12 VAC	P10

Jumper Setup
Refer to Jumper section

Wiring Diagram (1999/2000)

Always refer to the wiring diagram affixed to the inside of your spa pack's power box cover as main reference!

Year: 1999/2000; model: LSB/LS2B/3000B; pack: MSPA-1-AX3.



Pump 1	
Voltage	240 V
Green / Ground	P34
Black / Low Speed	P13
Red/ High Speed	P16
White / Com	P45

Blower	
Voltage	240 V
Green / Ground	P33
Black / Line	P29
White / Com	P46

Circulation Pump		
Voltage	120 V	240 V
Green / Ground	P30	P30
Black / Line	P14	P14
White / Neutral-Com	P17	P26

Pump 2	
Voltage	240 V
Green / Ground	P32
Black / Unused	P12
Red/ High Speed	P15
White / Com	P22

Ozone	
Voltage	120 V
Green / Ground	P31
Black / Line	P11
White / Neutral	P19

Light Connector	
White / Light	P10
Black / 12 VAC	P9

Jumper Setup

Refer to Jumper section

Professional Repair Kit

All you need in a single case!



Gecko's professional repair kit contains all you need to properly service and repair Gecko's line of power spa packs.

- Top side controls
- Temperature probes
- Pressure switch cables
- Pressure switches
- Heaters
- Heater cables
- Transformer
- Ground lugs
- Plastic standoffs
- Light cables
- Grommets
- Connectors
- Fuse kits
- Screws
- Etc.





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MSPA-1-AX SERVICE MANUAL



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Jumper Setup

•

Understanding
& Correcting
Error Messages

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System Malfunctions

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Part Replacement
Procedure

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