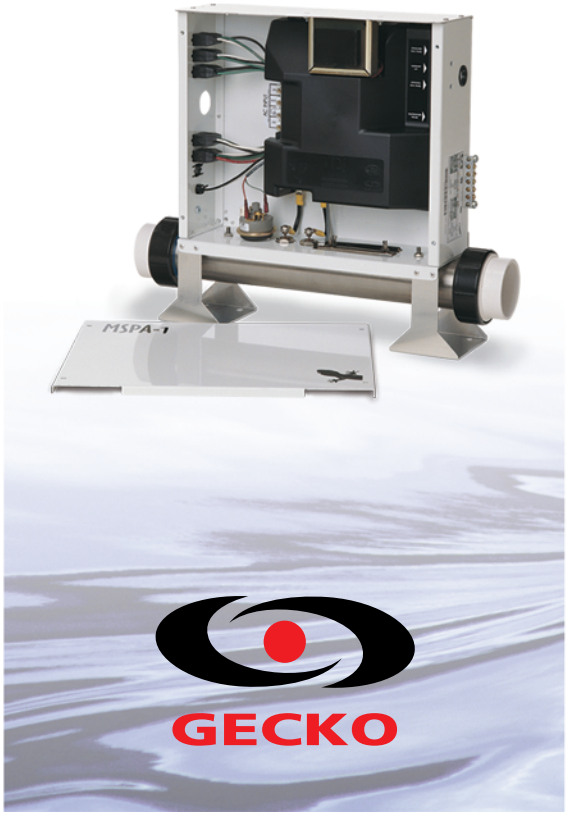
MSPA-1-AS

• Service Manual •

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



Contents

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.

Required Material

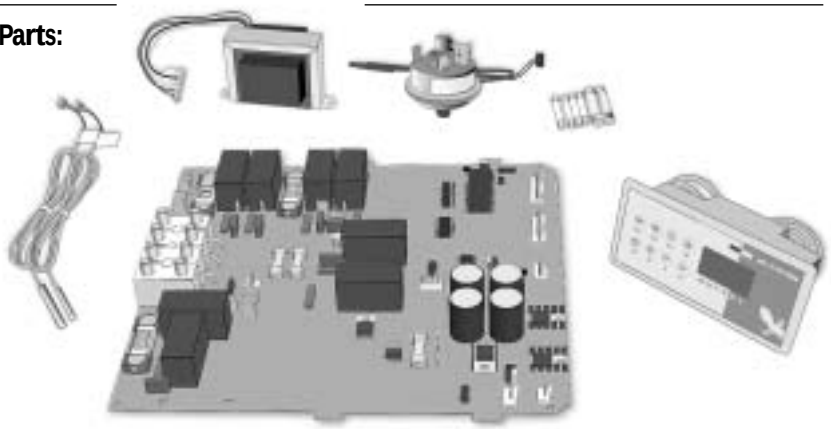
PRELIMINARY

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

Tools & Test Equipment:

Pliers
Phillips & flat screwdrivers
11/32" (M8) nut driver
1/4" (M6) open-end wrench
3/8" (M10) open-end wrench
Jumper cable
Multimeter
GFCI tester & digital thermometer (optional)

Pack Parts:



Temperature probe
High-limit sensor
MSPA-1-AS system board (or complete spa pack)
Transformer
Pressure switch
Fuses
Top side control

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

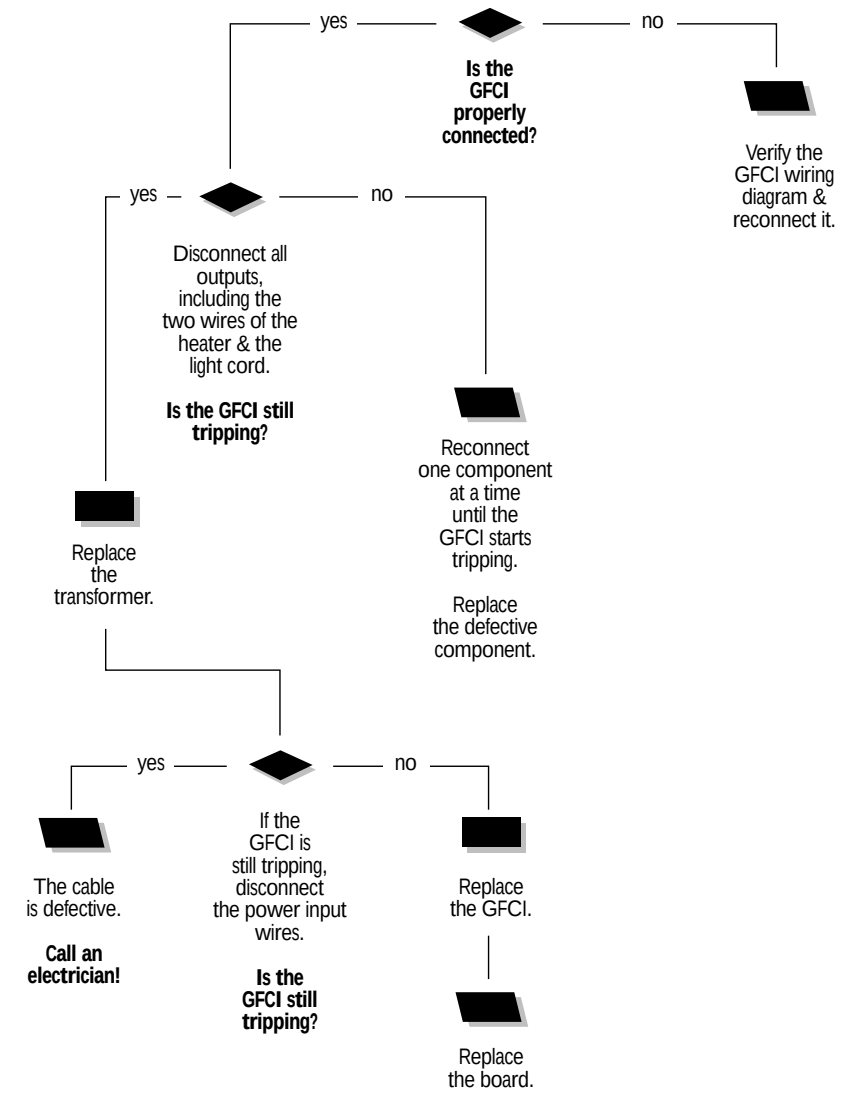
Gecko Electronics Inc. sells Professional Repair Kits that include everything needed for MSPA-1-AS Power Spa Pack servicing. For more information, go to the last page of this manual.

Notes:

GFCI Flow Chart

POWER & GROUND CHECK

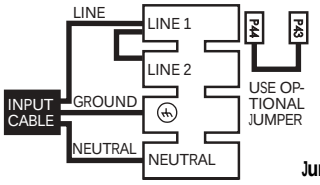
If the GFCI trips, follow the troubleshooting flow chart below to identify the source of the problem.



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

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

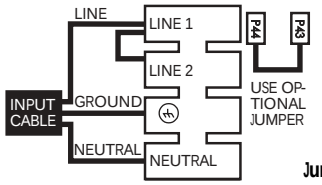
1 x 230 VAC (32 A) input supply wiring



Jumper JMP1 set in "HC" mode!

Note: For systems manufactured before 1999, if P43 & P44 are missing, use a #6 gage (4 mm dia.) cable and install it between Line 1 and Line 2.

1 x 230 VAC (16 A) input supply wiring



Jumper JMP1 set in "LC" mode!

Note: For systems manufactured before 1999, if P43 & P44 are missing, use a #6 gage (4 mm dia.) cable and install it between Line 1 and Line 2.

GFCI Trips! POWER & GROUND CHECK

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 miswiring are very common.

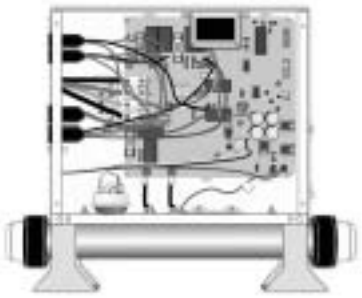
If the breaker is properly wired, GFCI trippings can occur when the total amount of current drawn by the spa exceeds the rating of the breaker. Such an occurrence, however, is very unlikely since each output of the spa pack is individually fused and fuses will blow before the GFCI trips.

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.

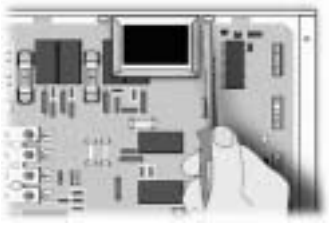
Several different models of GFCIs are available on the market. Note that our illustrations are generic.

1• Verify if the GFCI is properly connected.

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



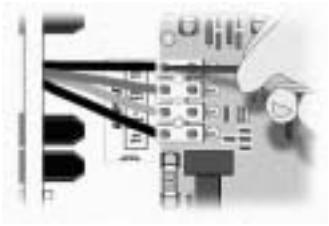
3• If the GFCI is properly connected but still tripping, disconnect all outputs, including the two wires of the heater & the light cord.



4• If the GFCI still trips, replace the transformer.

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

5• **If the GFCI still trips even after the transformer has been replaced:**



a- Disconnect the power input wires.

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

Call an electrician!

b- If the GFCI stops tripping, replace it.

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

Notes:

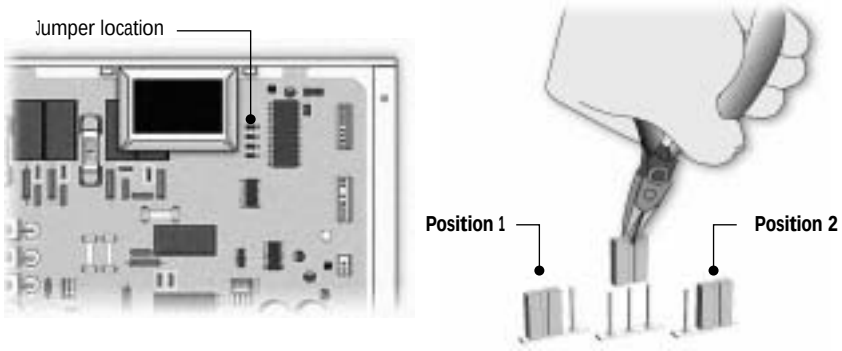
Jumper Setup

PROGRAMMING

It is possible to change some parameters of your MSPA-1-AS Spa Pack by positioning specific jumpers located on the board.

To access the jumpers, first remove the plastic cover inside your MSPA-1-AS Spa Pack power box referring to 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 using a pair of pliers and replace it in the desired position.

Jumper JMP1:	**Current limiting option**

Jumper JMP1 is used to limit the current drawn when the 2 pumps are used.

Position 1 (HC):	The heater may not be turned on at the same time as pump 2.
Position 2 (LC):	Pump 2 is disabled. Also, the heater may not be turned on if pump 1 is running at high speed or if the blower is on.

Jumper JMP2:	**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 JMP3:	**Pump 1**
Position 1:	Two-speed pump.
Position 2:	Single-speed pump.

Jumper JMP4:	**Pump 2**
Position 1:	Two-speed pump.
Position 2:	Single-speed pump.

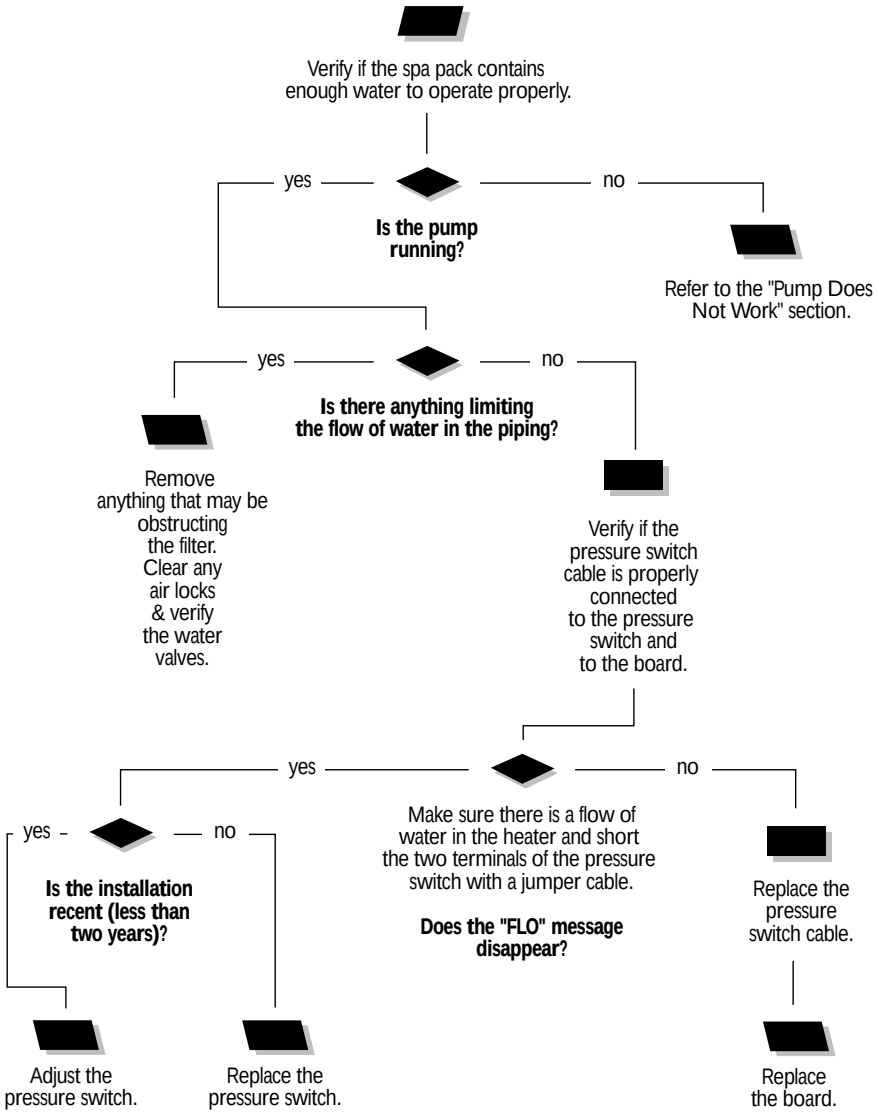
Notes:

"FLO" Flow Chart

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.

The heater barrel has to be installed on the pressure side of the pump and not on the suction side.



"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 (whether manually or automatically) activated.

Note: The heater barrel has to be installed on the pressure side of the pump and not on the suction side!

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.

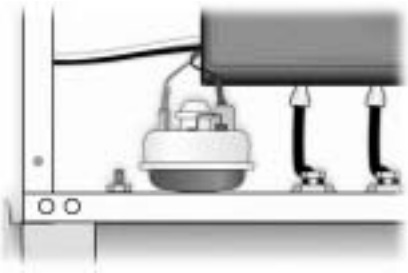
The spa pack must contain enough water to operate properly. The "FLO" message can appear if the spa filter is dirty or if something is limiting the flow of water in the piping.

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 to the pressure switch and to the board.

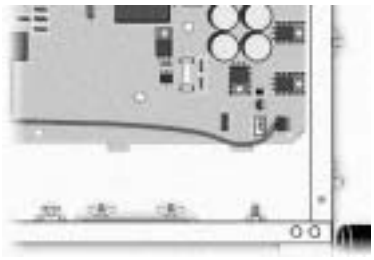
4• Make sure there is a flow of water in the heater and short the two terminals of the pressure switch with a jumper cable.

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.

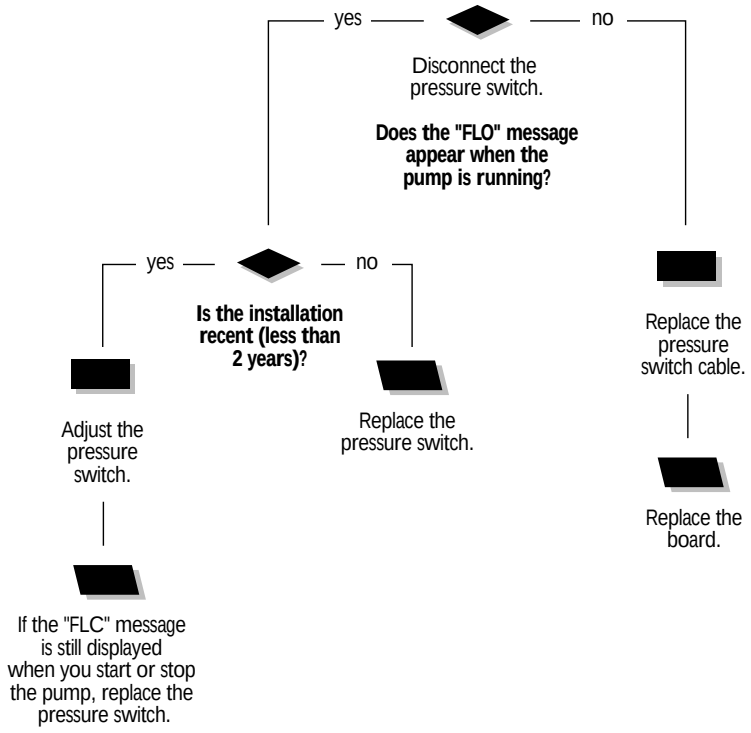
7• If the problem persists, replace the board referring to the "How to Replace the Board" section of this manual.

Notes:

"FLC" Flow Chart

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.

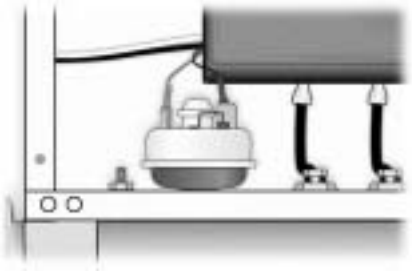


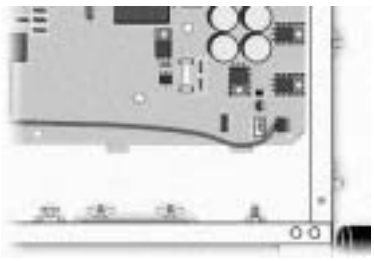
"FLC" Error Message

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.

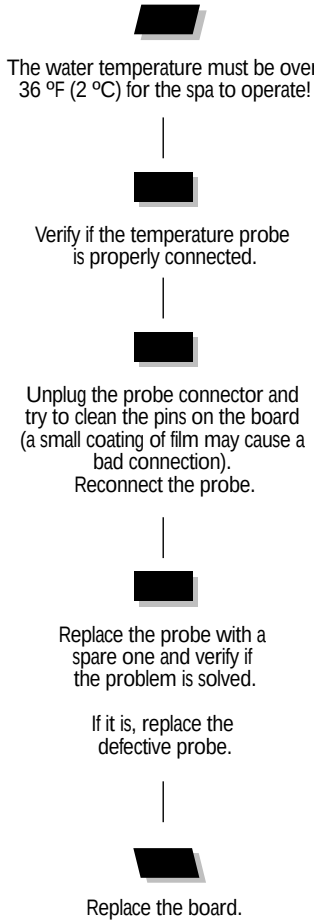
3• If the problem persists, replace the board referring to the "How to Replace the Board" section of this manual.

"Prr" Flow Chart

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 1999 onward, the "Prr" message is ignored for an hour to allow the water temperature to reach 36 ºF (2 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 1999 onward, the "Prr" message is ignored for an hour to allow the water temperature to reach 36 ºF (2 ºC).

The water temperature must be over 36 ºF (2 ºC) 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.

"Prh" Flow Chart

The "Prh" message indicates a problem with the high-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!

Verify if the high-limit sensor
(the sensor touching the heater barrel)
is properly connected.

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).

Reconnect the sensor.

Replace the sensor with a spare one
and verify if the problem is solved.

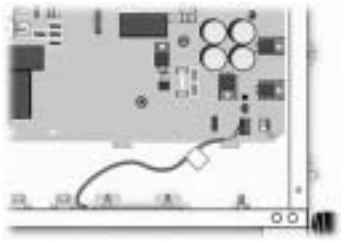
If it is, replace the defective sensor.

Replace the board.

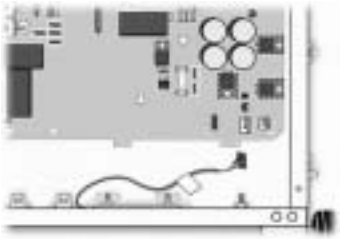
"Prh" Error Message

The "Prh" error message is displayed when a problem is detected with the high-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 high-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.

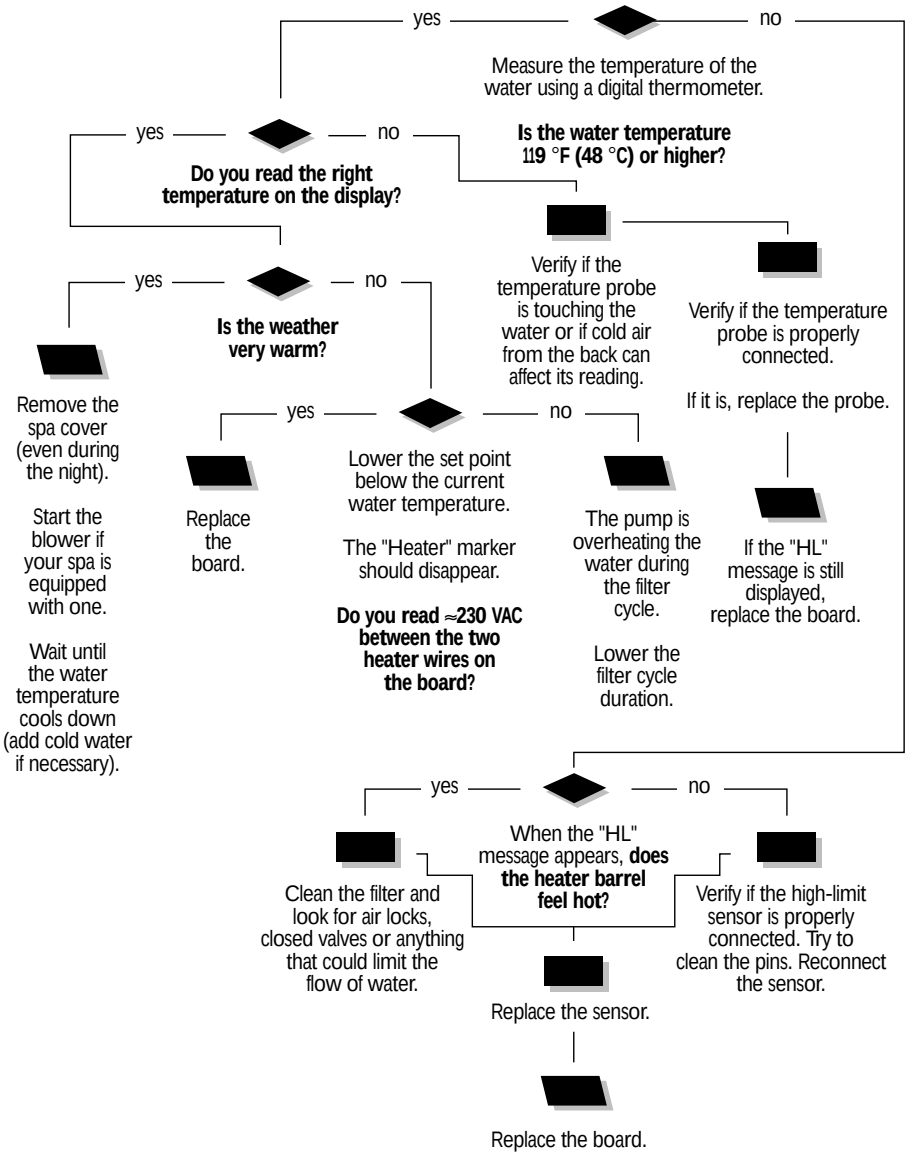
If the "Prh" message is still displayed, replace the high-limit sensor by a spare one and verify if the problem is solved.

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

"HL" Flow Chart

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

Note: Switch the GFCI off then on between each step to reset the system!



"HL" Error Message

The "HL" error message is displayed when a problem is detected with the high-limit sensor: the system has shut down the heater because the water temperature at the heater has reached 119 °F (48 °C).

Switch the GFCI off then on between each step to reset the system!

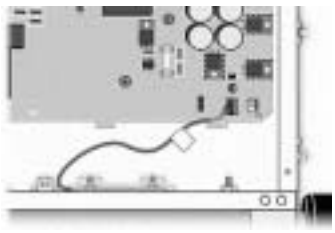
1• With the help of a digital thermometer, measure the temperature of the water.

2• **If the reading is below 119 °F (48 °C):**

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 high-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). Reconnect the sensor.

c- If the "HL" message is still displayed, replace the high-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 119 °F (48 °C) or higher:**

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

Go to page 24 if the top side control does not display the right temperature.

"HL" Error Message

If a digital thermometer reading of the water temperature is 119 °F (48 °C) or higher while the right temperature is displayed on the top side control, proceed as follows:

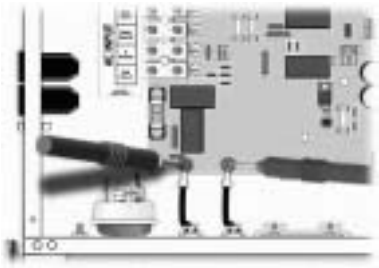
If the weather is very warm:

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 ≈230 VAC**, the water may be overheated by the pump during the filter cycle.

Lower the filter cycle duration referring to the User manual.

5• **If you do read ≈230 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 119 °F (48 °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.

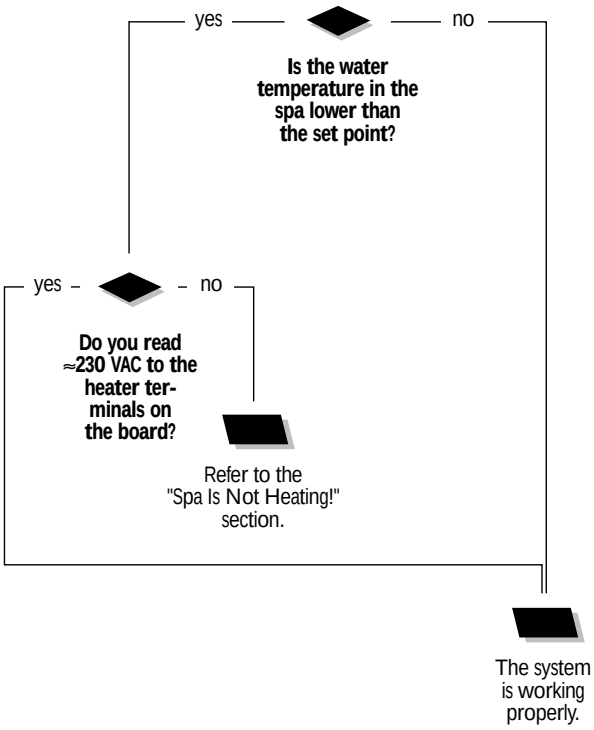
2• Verify if the temperature probe is properly connected to the board.

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.

"FrE" Flow Chart

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.

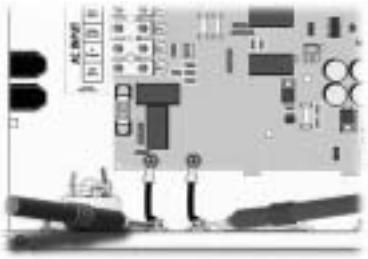


"FrE" Error Message

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.



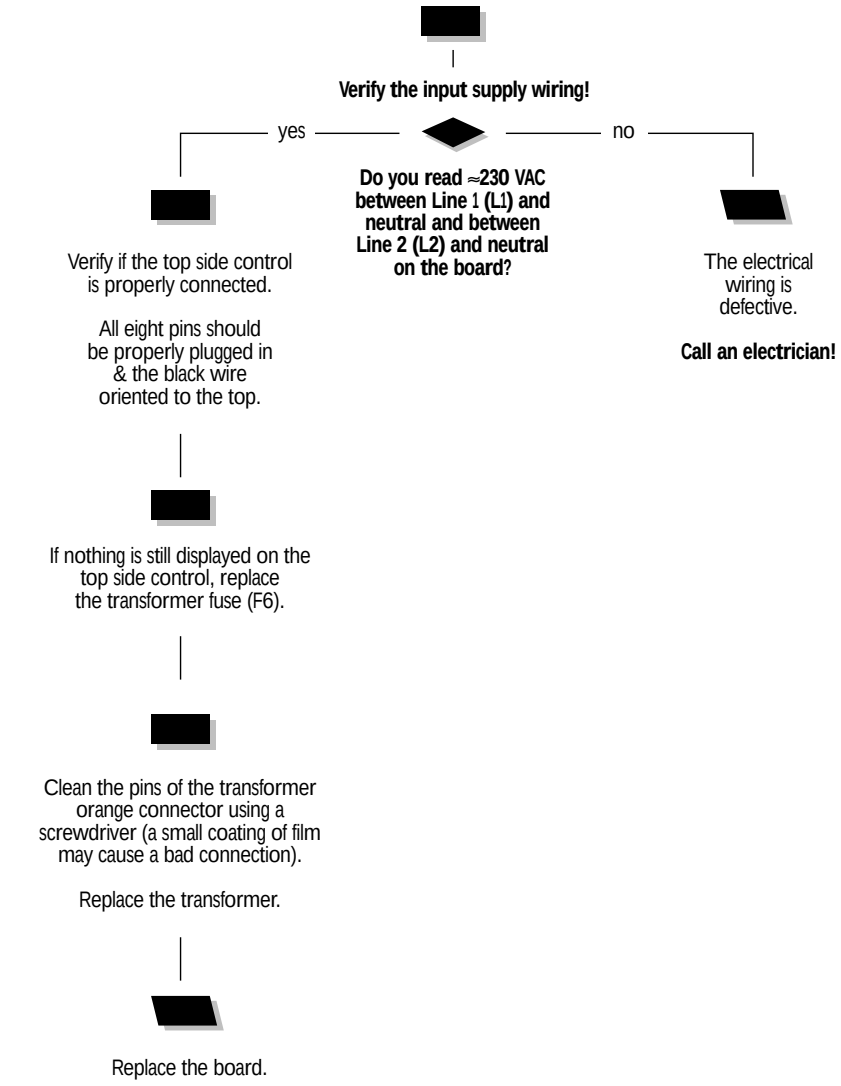
2• If the water temperature is lower than the desired temperature (or "set point"), remove the plastic cover and measure the voltage to the heater.

If you read ≈230 VAC, the freeze protection of the system is working properly.

If you do not read ≈230 VAC, refer to the "Spa Is Not Heating!" section of this manual.

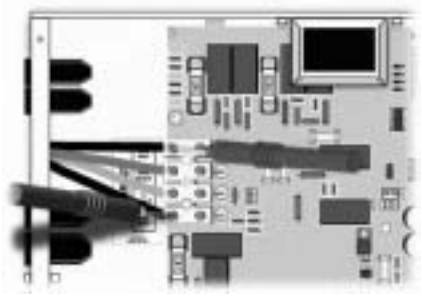
"Nothing Works!" Flow Chart

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



Nothing Works!

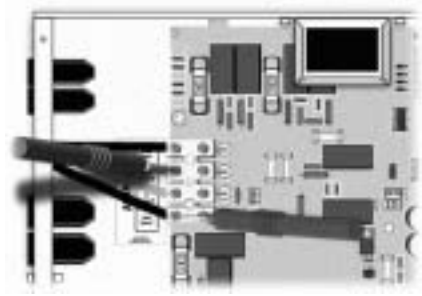
If the equipment is connected but nothing seems to work, the power supply must be defective. Refer to the "Power & Ground Check" section of this manual. If required, proceed as follows:



1• On the power supply terminal block, measure the voltage between Line 1 (L1) and neutral.

You should read ≈230 VAC.

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



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

You should read ≈230 VAC.

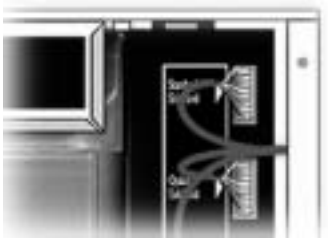
3• If you do not get good readings, the electrical wiring must be defective.

Call an electrician!

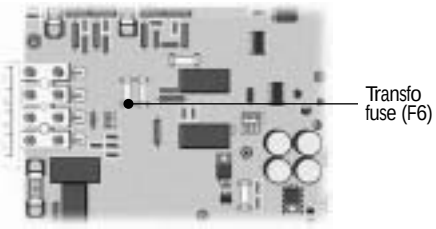
Nothing Works!

TROUBLESHOOTING

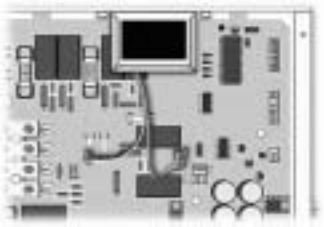
If voltage readings are correct but nothing seems to work, proceed as follows:



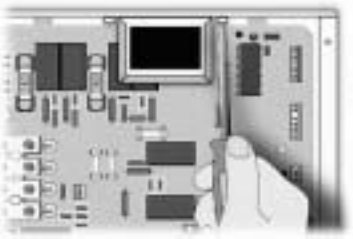
1• Verify if the top side control is properly connected to the board.



2• If the problem persists, replace the transformer fuse (F6).



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).



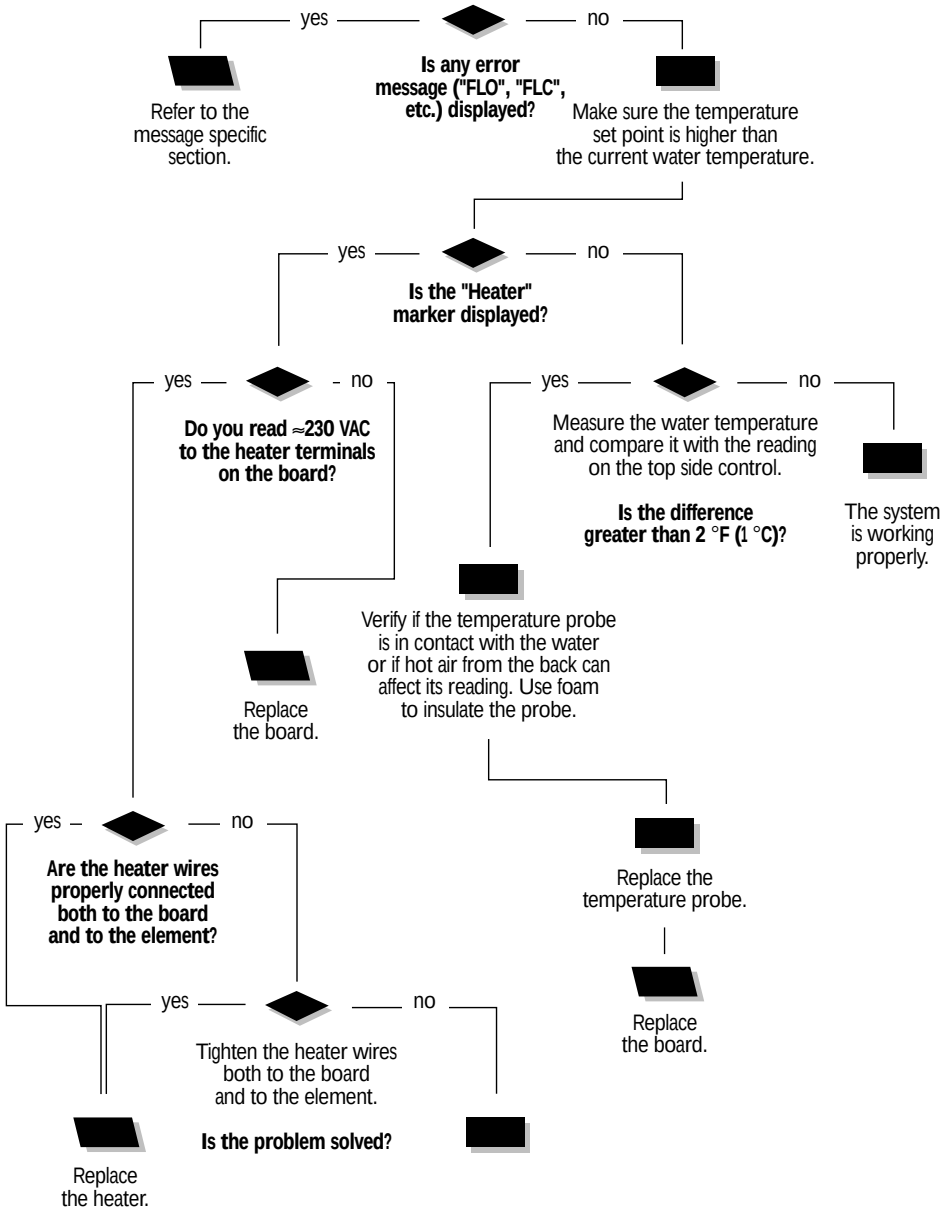
4• If the system still does not work, replace the transformer.

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.

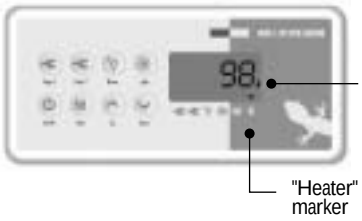


Spa Is Not Heating!

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

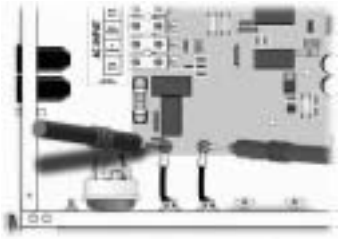
5• If so, use foam to insulate the back of the probe.

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.

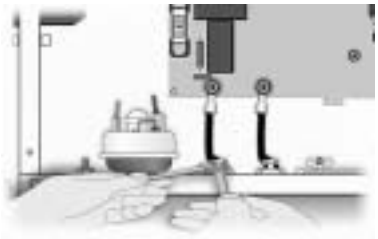
Spa Is Not Heating!

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



1• Remove the plastic cover and measure the voltage to the heater terminals (P31 & P32) on the board.

If you do not read ≈230 VAC, replace the board.



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

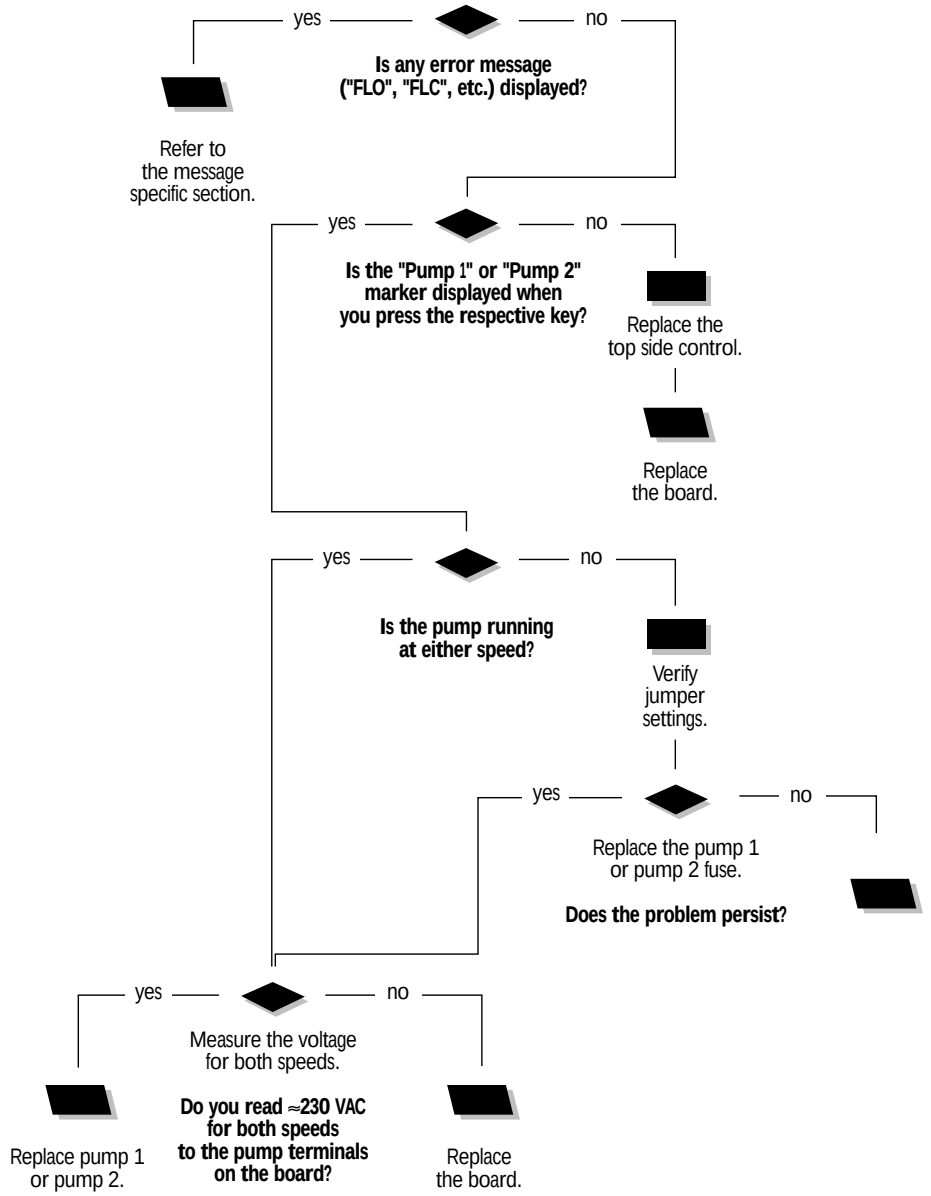
If necessary, tighten the two wires both to the heating element and to the board.

3• If the problem still persists, replace the heater referring to the "How to Replace the Heater" section of this manual.

Notes:

Pump Flow Chart

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

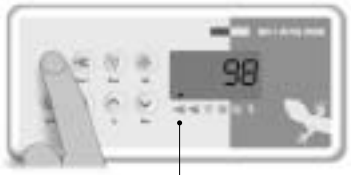


Pump 1 Does Not Work!

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!



"Pump 1" marker

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• Verify if the "Pump 1" marker is displayed when you press the respective key.

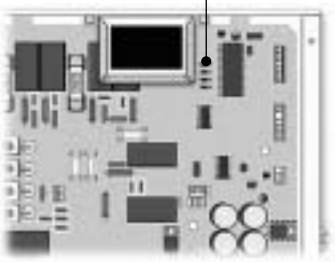
3• If the "Pump 1" marker is not displayed, use a spare top side control to see if the first is defective.

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.

4• If the "Pump 1" marker is displayed when you press the respective key, verify if pump 1 is running (at either speed).

Jumper location

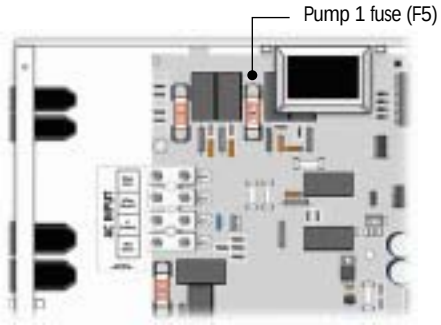


Verify jumper JMP3 position:
Position 1: two-speed pump
Position 2: single-speed pump

Modify the jumper position if necessary, referring to the respective section of this manual.

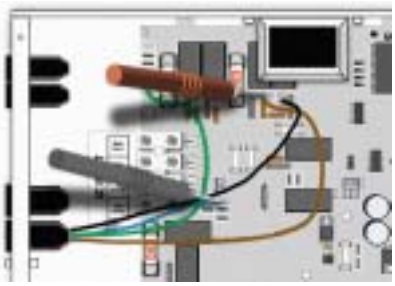
Pump 1 Does Not Work!

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



1• Replace the pump 1 fuse (F5).

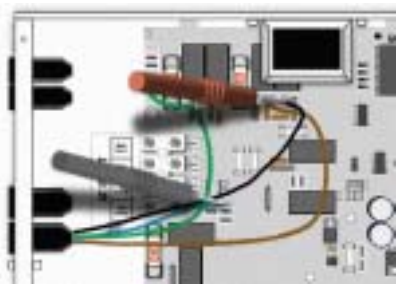
2• If replacing the fuse is not effective or pump 1 only runs at one speed, measure the voltage for both speeds on the board as explained below:



Turn pump 1 to high speed and measure the voltage between the pump terminals (P15 & P22 on the board).

You should read ≈230 VAC.

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



3• Turn pump 1 to low speed and measure the voltage between the pump terminals (P19 & P22 on the board).

You should read ≈230 VAC.

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

5• 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!

"Pump 2" marker

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

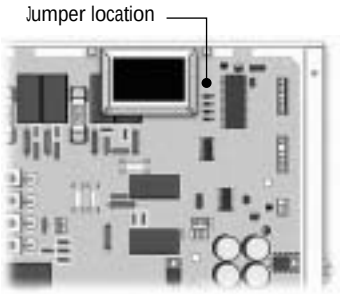
2• Verify if the "Pump 2" marker is displayed when you press the respective key.

3• If the "Pump 2" marker is not displayed, 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.

4• If the "Pump 2" marker is displayed when you press the respective key, verify if pump 2 is running (at either speed).



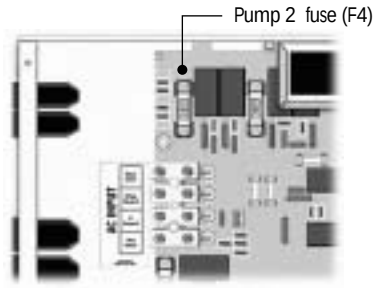
Verify jumper JMP4 position:

Position 1:	two-speed pump
Position 2:	single-speed pump

Modify the jumper position if necessary, referring to the respective section of this manual.

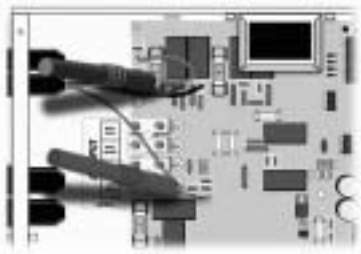
Pump 2 Does Not Work!

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



1• Replace the pump 2 fuse (F4).

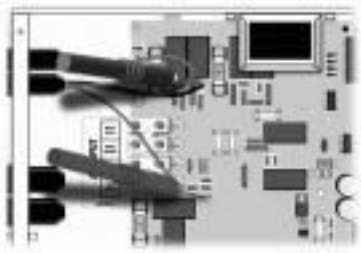
2• If replacing the fuse is not effective or pump 2 only runs at one speed, measure the voltage for both speeds on the board as explained below:



Turn pump 2 to high speed and measure the voltage between the pump terminals (P13 & P24 on the board).

You should read ≈230 VAC.

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



3• Turn pump 2 to low speed and measure the voltage between the pump terminals (P14 & P24 on the board).

You should read ≈230 VAC.

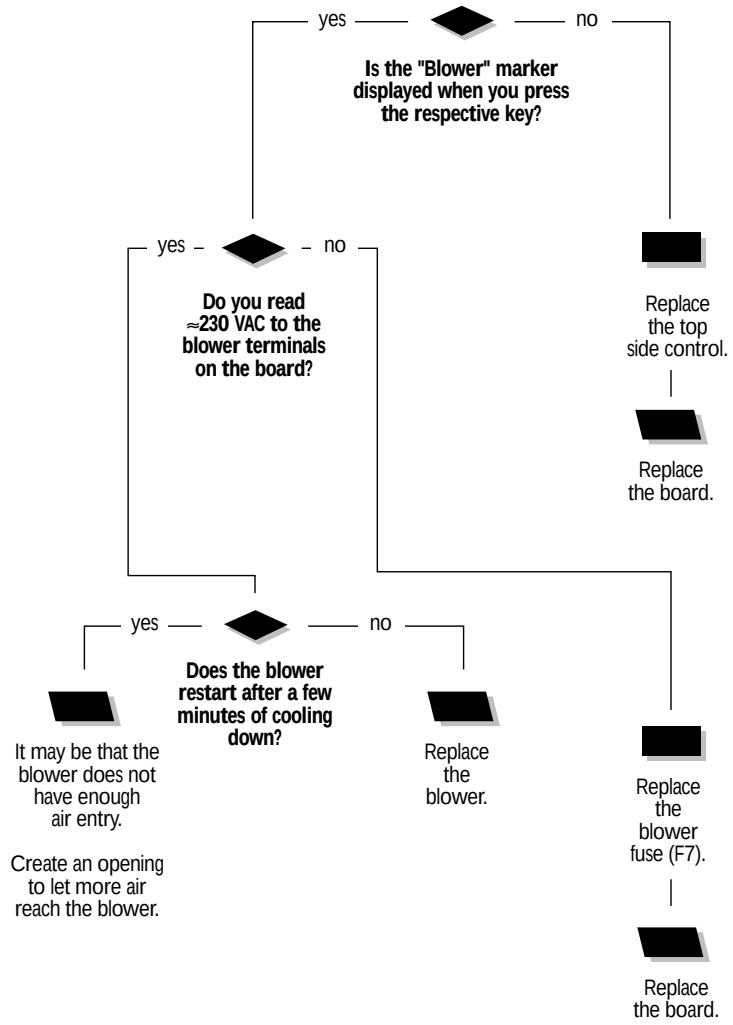
4• If the voltage reading is correct, replace pump 2.

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

Notes:

Blower Flow Chart

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

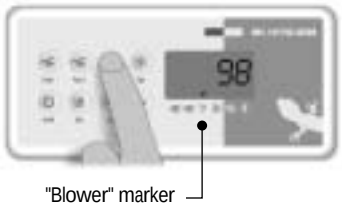


Blower Does Not Work!

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 is displayed when you press the respective key.

2• If the "Blower" marker is not displayed, 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.

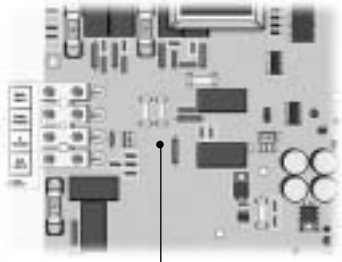
Blower Does Not Work!

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

1• If the "Blower" marker is displayed when the blower is running, measure the voltage between the blower terminals (P17 & P23 on the board).

You should read ≈230 VAC.

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



2• If the voltage reading is not correct, replace the blower fuse (F7).

3• If the voltage reading is still 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.

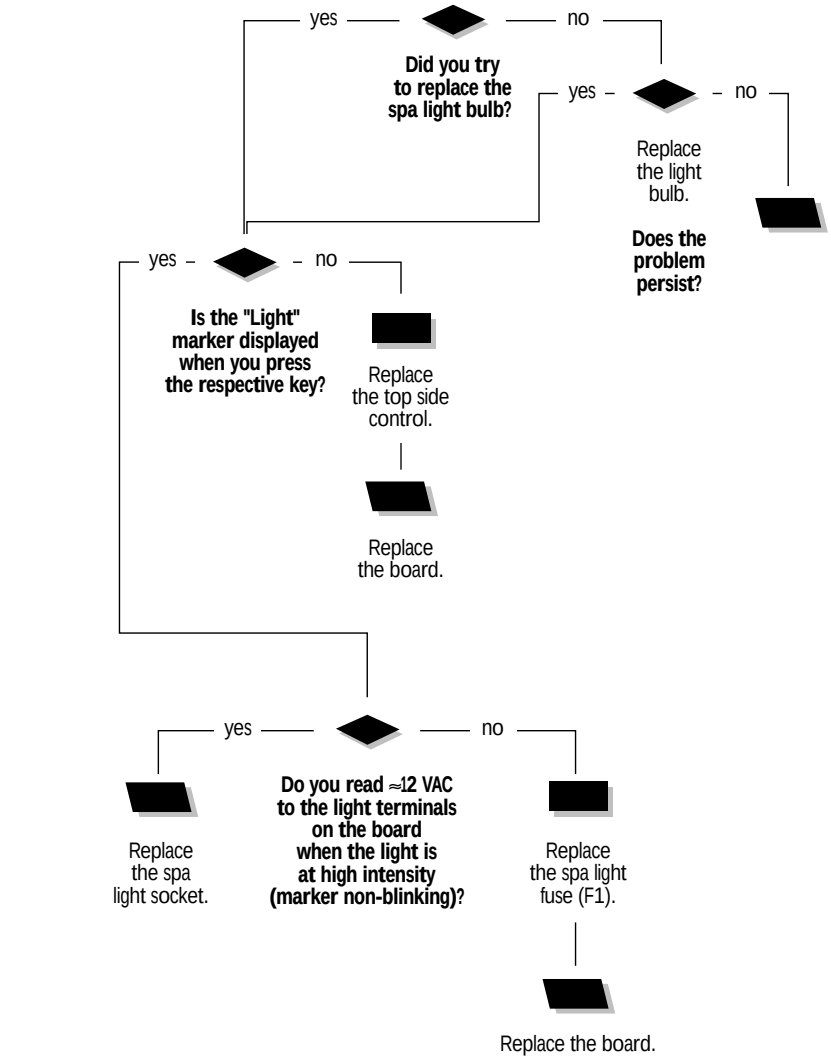
5• If the blower does restart after cooling down, it may be that the blower does not draw enough air.

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.

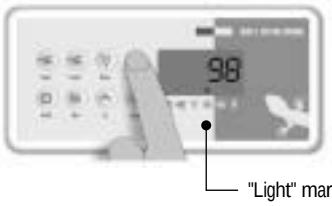


Spa Light Does Not Work!

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

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 is displayed when you press the respective key.

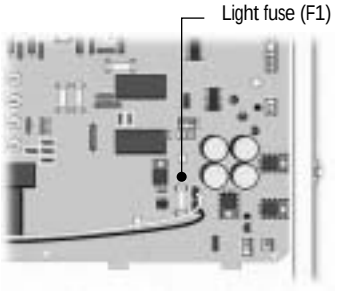
3• If the "Light" marker does not appear, use a spare top side control to verify if the first is defective.

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.

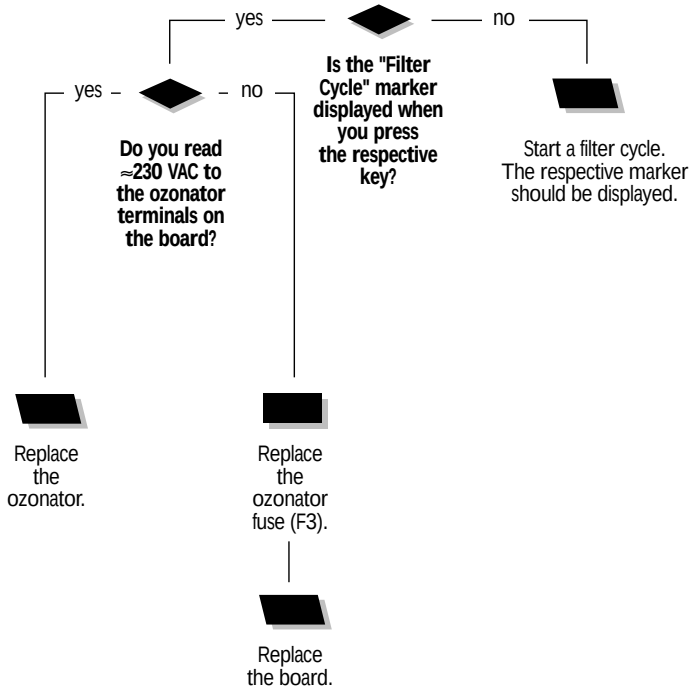


5• If the voltage reading is not correct, replace the light fuse (F1) on the board.

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

Ozonator Flow Chart

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



Ozonator Does Not Work!

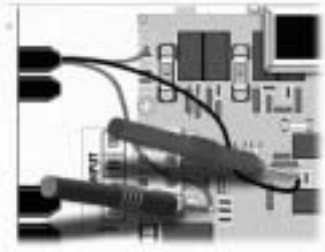
If the ozonator does not work, proceed as follows:

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• Verify if the "Filter Cycle" marker is displayed when you press the respective key.

If not, start a filter cycle referring to the User manual.

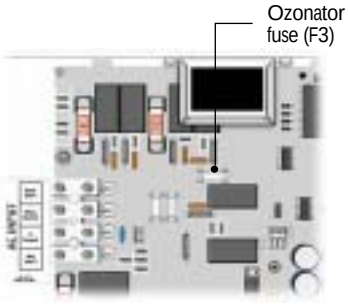


2• Measure the voltage between the ozonator terminals (P12 & P21 on the board).

You should read ≈230 VAC.

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

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

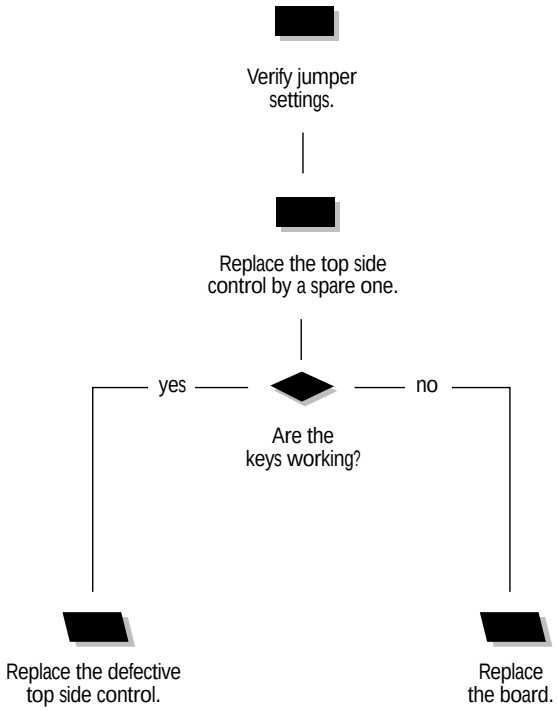


4• If the voltage reading is not correct, replace the ozonator fuse (F3) on the board.

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

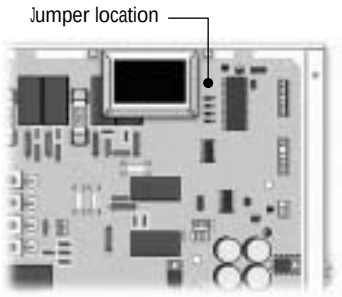
Keys Flow Chart

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 if the jumpers are properly set 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.

Replace the Board

HOW TO

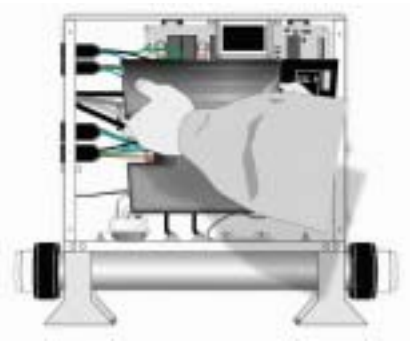
To replace the board, proceed as follows:

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).

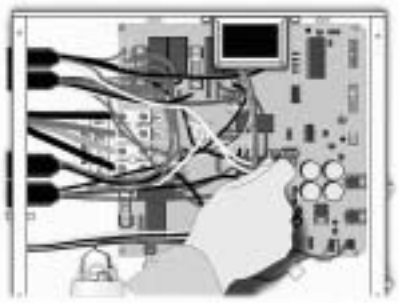
2• Disconnect the top side control(s) and the temperature probe (connectors located in the upper right corner of the board).

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

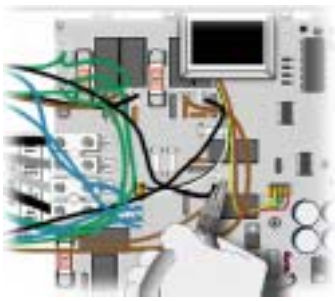


4• Gently remove the plastic cover by releasing its upper part first.

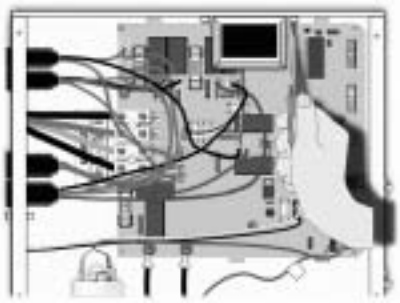
Replace the Board



5• Disconnect the transformer.

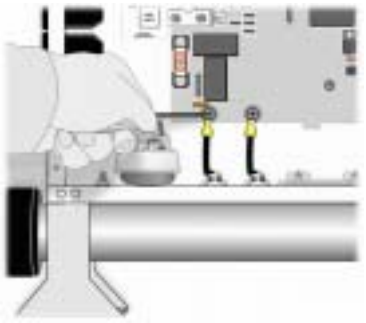


7• Disconnect all outputs (pumps, spa light, ozonator) using a pair of pliers. Make sure not to damage the connectors!

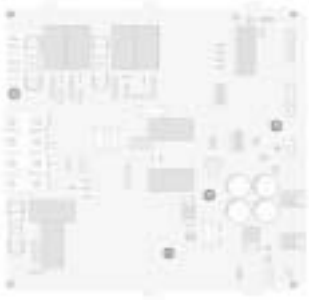


6• Using a nut driver, remove the transformer.

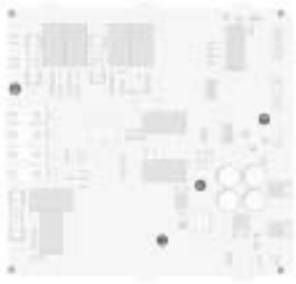
8• Disconnect the high-limit sensor and the pressure switch.



9• Disconnect the heater by loosening the two screws P32 & P33 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 1999, loosen the 6 screws.*

HOW TO Replace the Board

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 high-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.

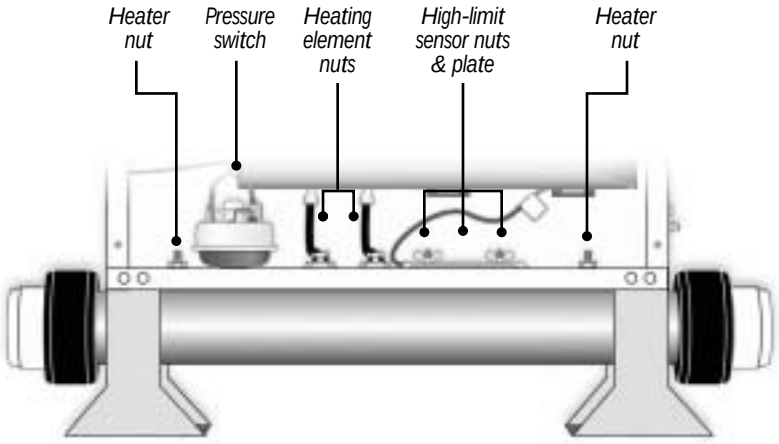
23• Reconnect the power input wires, close the cover, power the equipment on and proceed with a general test of your spa pack.

Replace the Heater

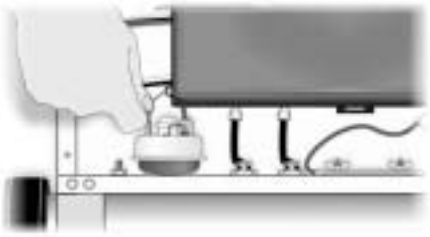
HOW TO

To replace the heater, proceed as follows:

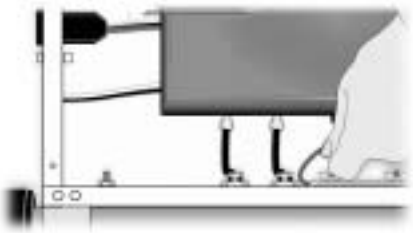
Before you replace the board, make sure the equipment is powered off!



Note: Before proceeding, make sure all power input wires are disconnected and spa valves are closed!

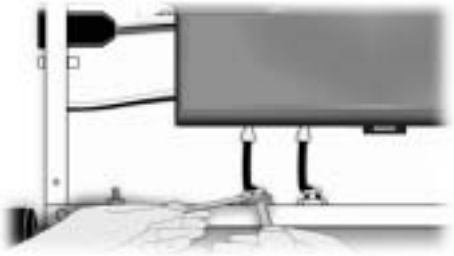


1• Disconnect the two wires at the top of the pressure switch, then unscrew and remove the switch.

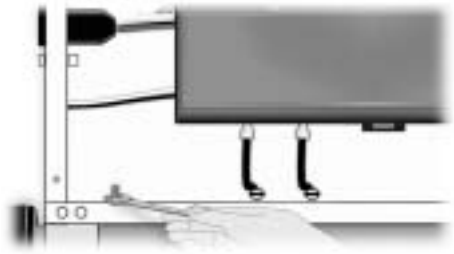


2• Loosen the two wing nuts that hold the plate of the high-limit sensor and remove the sensor.

HOW TO Replace the Heater



3• With the help of an open-end wrench, disconnect the heater wires (remove only the two upper nuts). Do not touch the large nuts!



4• Loosen the two heater nuts and release the heater from under the spa.

5• Slide the new heater into place and fix it to the power box using the two nuts.

The two heater-fixing nuts must be properly tightened because they also serve as a current collector in case of heater failure.

6• Reinstall the high-limit sensor and the plate.

Tighten the two wing nuts just enough to hold the sensor plate in place.

7• Gently reconnect the heater wires with an open-end wrench, while holding the lower nuts with another wrench to avoid damaging the contact pins.

8• Verify if the heater is properly connected to the board.

9• Reinstall the pressure switch and reconnect the wires (in no particular order).

Adjust the Pressure Switch

HOW TO

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.

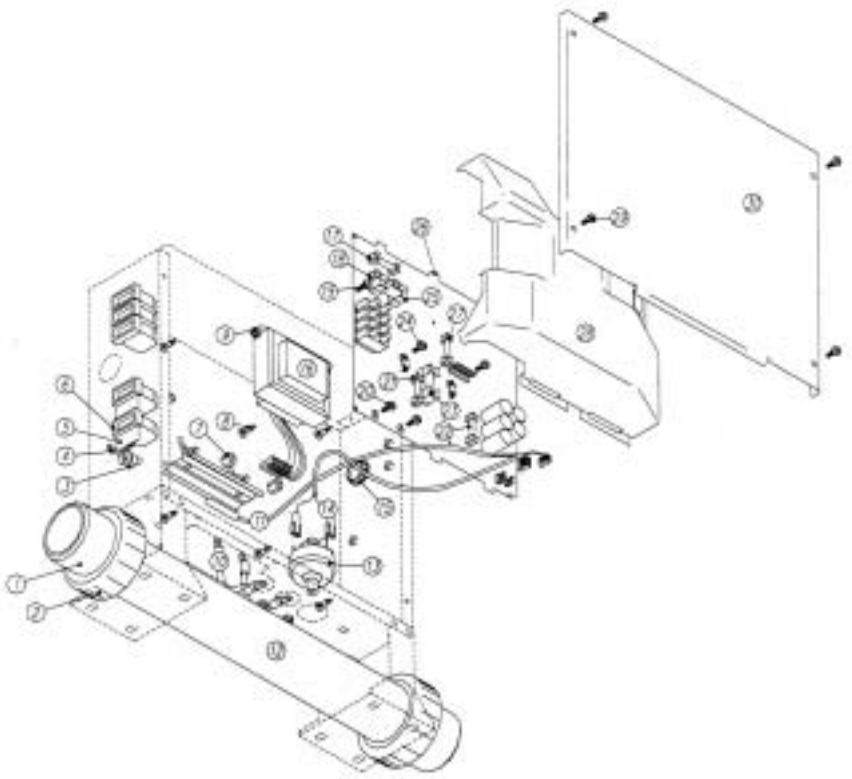
Notes:

We recommend that field service technicians keep the items marked with an asterisk (*) in stock.

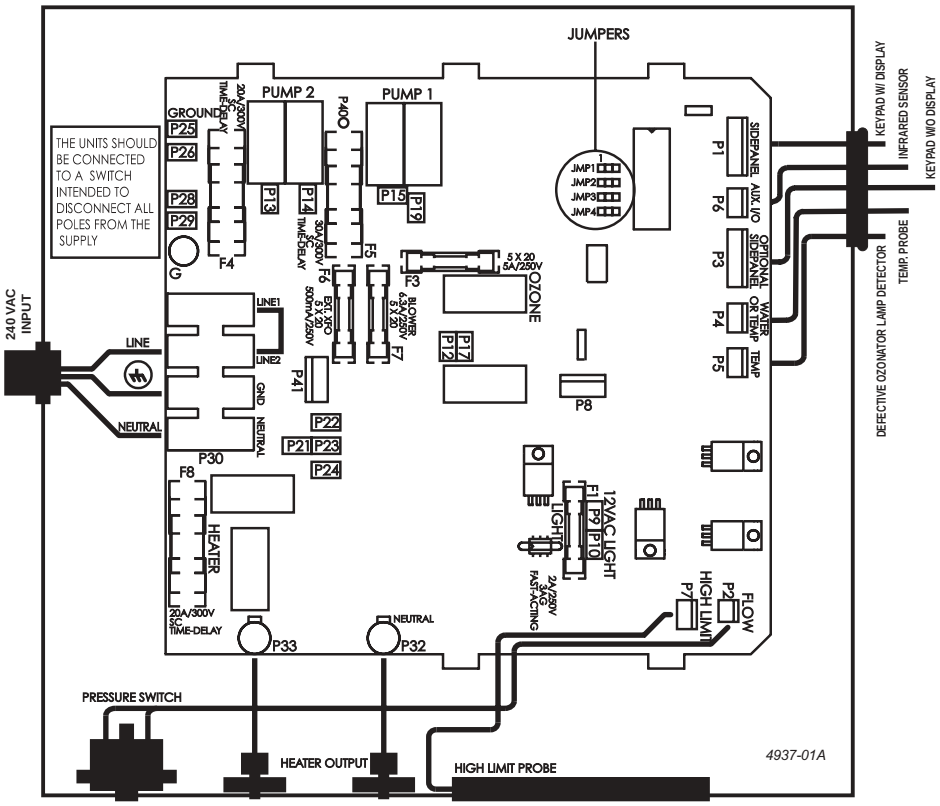
Ref.	Part Number	Description	Retail U.S.	CDN	
1	530AB0061	Tail piece for 2" heater	5.39	7.33	
1	530AB0042-P5	Gasket for 2" tail piece (package of 5)	8.00	10.88	
2	530AB0055	Nut for 2" heater	4.90	6.67	*
3	250AA0027-P25	Strain relief for light cord (package of 25")	3.50	4.76	
3	250AA0074-P25	Strain relief for external heater's high limit sensor (pack. of 25)	3.50	4.76	
4	EWGX178	Light cord (option LS)	7.57	10.3	*
5	140AA0125-P10	Blank plate for output connector hole (package of 10)	10.89	14.82	
6	EWGX200	J&J mini-connector for pump 1	7.26	9.88	
6	EWGX199	J&J mini-connector for pump 2, single-speed	6.68	9.09	
6	EWGX200	J&J mini-connector for pump 2, two-speed	7.26	9.88	
6	EWGX204	J&J mini-connector for ozonator	5.92	8.06	
6	EWGX203	J&J mini-connector for blower	5.92	8.06	
6	EWGX205	J&J mini-connector for circulation pump	5.92	8.06	
6	EWGX211	AMP connector for pump 1	7.26	9.88	
6	EWGX212	AMP connector for pump 2, single-speed	6.68	9.09	
6	EWGX213	AMP connector for pump 2, two-speed	7.26	9.88	
6	EWGX206	AMP connector for ozonator	6.68	9.09	
6	EWGX208	AMP connector for blower	6.68	9.09	
6	EWGX207	AMP connector for circulation pump	6.68	9.09	
6	EWGX209	AMP connector for light	5.34	7.27	
6	EWGX188	AMP connector for external vertical heater	8.33	11.33	
7	282FB0104-P10	Metal standoffs for triac (package of 10)	22.76	30.97	
8	282HA0051-P25	Plastic standoffs for board (package of 25)	17.04	23.18	*
9	282CA0092-P25	Nuts for transformer (package of 25)	7.57	10.30	
10	EWGX123-P5	Heater cable for in-line heater (package of 5)	10.47	14.24	
11	EWGX122	High-limit sensor for in-line heater	13.99	19.03	*
11	EWGX183	High-limit sensor for external vertical heater	15.59	21.21	*
12	530AA0012	In-line 5.5 kW heater	143.17	194.79	
12	530AB0087	5.5 kW 240 V element for in-line heater	88.20	119.99	*
13	510AD0064	Pressure switch	28.42	38.67	*
14	EWGX124-P5	Pressure switch cable for in-line heater (package 5)	11.80	16.06	*
15	250AB0036-P25	Grommet for cable opening (package of 25)	5.45	7.42	
16	ACGX020	120 V transformer	45.57	62.00	*
16	ACGX050	240 V transformer (option T2)	59.96	81.58	*
17	430AC0054-P10	Fuses for circulation pump (package of 10)	10.69	14.55	*
18	430AC0054-P10	Fuses for ozonator (package of 10)	10.69	14.55	*
19	282AD0038-P25	Ground screws (package of 25)	9.86	13.42	
20	282AD0072-P25	Screws for heater cable (package of 25)	8.80	11.97	
21	430AC0069-P10	Fuses for blower (package of 10)	17.82	24.24	*
22	430AC0117-P10	Fuses for light (package of 10)	11.14	15.15	*
23	430AE0027-P10	Fuses for pump 1 (package of 10)	56.57	76.97	*
24	282AB0128-P25	Screws for triac (package of 25)	7.68	10.45	
25	430AE0027-P10	Fuses for pump 2 (package of 10)	56.57	76.97	*
26	EQGX155	Main board for: MSPA-2-P122-02-LS-H5.5-JJM	225.00	306.12	*
26		MSPA-2-P122-01-LS-H5.5-JJM	225.00	306.12	*
26		MSPA-2-P122-01-LA-H5.5-JJM	225.00	306.12	*
26		MSPA-2-P122-01-LS-JJM	225.00	306.12	*
26		MSPA-2-P121-01-LS-JJM	225.00	306.12	*
26		MSPA-2-P122-02-LS-JJM	225.00	306.12	*

We recommend that field service technicians keep the items marked with an asterisk (*) in stock.

Ref.:	Part Number	Description	Retail U.S.	CDN	
26	EQGX196	Main board for:			
		MSPA-1-P122-B2-01-CP2-LS-HV-JM-NF-AX	288.97	393.15	*
26	EQGX157	Main board for:			
		MSPA-1-P122-P222-B1-01-LS-H5.5-JM	302.51	411.58	*
26		MSPA-1-P122-P222-B1-01-LS-H5.5-AMP	302.51	411.58	*
26	EQGX151	Main board for:			
		MSPA-1-P112-P212-B1-01-LS-CP1-HV-JM	311.06	423.21	*
27	430AC0092-P10	Fuses for transformer (package of 10)	11.14	15.15	
28	ACGX037	Plastic cover for MSPA-2	22.94	31.21	
29	282AB0128-P25	Screws for cover (package of 25)	7.68	10.45	
30	MQGX152	Metal cover	36.97	50.30	
	EWGX125	10-foot temperature probe	19.20	26.12	*
	EWGX245A	25-foot temperature probe	23.87	32.48	*



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



Pump 1	
Voltage	240 V
Green / Ground	P29
Black / Low Speed	P19
Brown / High Speed	P15
Blue / Neutral	P22

Blower	
Voltage	240 V
Green / Ground	P28
Brown / Line	P17
Blue / Neutral	P23

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

Pump 2	
Voltage	240 V
Green / Ground	P26
Brown / Line	P13
Blue / Neutral	P24

Ozonator	
Voltage	240 V
Green / Ground	P25
Brown / Line	P12
Blue / Neutral	P21

Heater	
Line 1	P33
Neutral	P32
Green / Ground	Ground

Jumper Settings

See respective section

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- Light cables
- Grommets
- Connectors
- Fuse kits
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