

## How to convert a spa control box from 240v to 120v

Hi, I bought one of your Balboa control boxes to upgrade my old air button controlled spa but i don't see how you make it run on 120 volts --the heater is a 5.5 kw. Did i get the wrong controller?

One of the nice things about the newer control boxes is that they offer many options and Balboa has many. Unless ordered special from Balboa most all of their control boxes come ready to run 240 volt hookups. If you want to use 120v you need to change a few things with your new control box.

On Balboa VS series there should be a short white wire taped to the back of the control box, this is to be your jumper that will connect the RED main terminal to the neutral main terminal SEE THE WIRE DIAGRAM ON THE INSIDE OF THE BOX. Then there is a row of small little switches - called DIP switches (usually down towards the bottom of the board just to the right side). Number 10 switch must be pushed UP, or ON, this puts the system into a lower AMP mode for the 120v hookup.

That's about it; if you have a pump cord you will just keep the colors matched up, Black cord wire to black main terminal. Be sure to use a GFCI cord for added safety. These have a small Test/Reset GFI built-in to the cord.

This is something that comes up a lot. When you purchase a Balboa VS 500, 501, or 510, they are pre wired from Balboa to run the pump(s) on 240v so if you have 120v pump(s) you need to change a few little things before you turn on your new controller. What happens is the pump either won't run or it cycles On and Off, On and Off, over and over. This is because you can't run a 240v pump on 120v. Most controllers that are convertible (120v or 240v) use 120v pumps -even in a 240v control box.

So back to what you need to change, PUMP 1 should be plugged into J23, next to that plug is a White wire -W1, the other end of that wire is most likely plugged into the WHITE AC patch just above your main wire hookup.

That end needs to be moved from the WHITE AC area, to the RED AC area just below the main wire terminal. Now that plug (J23) is wired for 240v. Most of the other functions work the same way. Plug J47 is for a circulation pump and its change over wire is W2 - right next to it. BLOWER or Pump2, use plug number J17/26 -and it has a change over wire next to it too.

## Balboa Continuous Filter Cycle

Balboa 2005 M7 control system. Problem is water is in continuous cycle with blower (dual pump system). Have made sure Filter cycle is set to FIL2 so it shouldn't cycle all time. Blower light is on and can't change this. Temperature of tub is 39C when it is set to 30C (it's hot here but water temp should drop in evening but doesn't much. Have tried putting into sleep mode but after awhile it defaults to ECON mode and water temp doesn't drop. Any opinion if there is a real fault on the control system or ideas what else it might be. Am getting a technician to check it out but would like to be prepared as to what he might say as I only want to change unit if absolutely necessary.

This sounds like you are having a problem with the spa circuit board. The technician should also verify that your incoming power has the proper voltage going to your spa.

## Sensors Out of Balance

**I have a Cal Spa 3 years old and I get the error message "sensors out of balance". I replaced the sensors and everything was fine for about 2 months. Now when I turn the tub on it shuts down and again I get the error code, "sensors out of balance." How do I fix this?**

If both the [spa high limit sensor](#) and the [spa temperature sensor](#) have been replaced then you can turn the breaker off on the spa try disconnecting both sensors and reconnecting and then turn the breaker back on and see if it will reset. If the sensors are not causing the problem then it may be the [spa circuit board](#). When spa sensors are Out of Balance, this means that the two temp sensors are sensing different temperatures, off by 2-3 degrees or more. Clean and reset both sensors and replug them into the board securely. If you still get the out of balance error, one or both sensors should be replaced.

## Cat 100 Control

**I have a Catalina spa with the Cat100 control. Last fall I replaced the heater just prior to the first snowfall, I could not get the tub to heat up past 52 degrees. It seemed like it was in sleep mode I tried contacting the reliable tech in our area. He said to press the light and the temp button at the same time and everything should be ok but same thing. Any ideas on how to get this thing working properly. Note: When I press the blower motor the heat light will come on for the duration of the cycle but will not continue to heat - the temp is around 68 now...**

I need to clarify that it is the [spa blower](#) button you are pressing and not the jet or pump button. Does the [spa pump](#) come on when you push the blower button as well as the blower? I am trying to determine if the [spa topside panel](#) is causing the problem, or if you have a bad [temperature sensor](#).

**Presently the Low speed motor is recirculating the water all of the time. The water temp now is 85 degrees and has been for the last three days. When I press the jets pump button the heater light comes on. The blower works fine. When I turn off the jet pump the heater light goes off. The spa recirculating motor stays on, never shuts off. I have also tried putting the mode into economy and back by pressing the Light button and Temperature button together nothing changes**

Is the pump that is running constantly a circulation pump separate from the main jet pump? If so, it should be running all the time. My thinking is, when you are turning on the main jet pump it is pushing enough water through the system closing the flow switch allowing the heater to turn on. But when it is just the circulation pump running it is not pushing enough water through to close the flow switch which would not allow the spa heater to come on. You can try removing your spa filter and run only the circulation pump and see if the heat light will come on.

**Tried removing the filter, still the same problem, no heat increase. Water still luke warm. ☹️**

If you can locate the pressure switch, it may be an adjustable switch with a small notched dial that can be spun to raise or lower the pressure requirement. Typically, they have a range of 1-5 psi. Turn the pressure switch counter clockwise, to see if that helps. If you look closely there are very small printed numbers next to the dial. Other thoughts could be that the new heater is very much smaller than your old heater, in terms of kilowatt output, or flow requirements, and is having trouble keeping up, or operating on low speed water flow.

## **Relay Clicks but Jets Don't Come On**

**Have a 3 zone spa with 3 pumps connected to a Balboa M7 (53672-02 2M7P3) controller pack and digital pad. When I push the Jets 3 button (Zone 3) there is an audible click but nothing happens. Zones 1 & 2 work fine, the spa heats and circulates without issue.**

**To test the #3 pump/motor I swapped the Zone 2 & 3 plugs where they connect to the control pack. The #3 pump and motor work fine. When reversed Zone 2 clicks and nothing happens. Put back to normal the result is consistent. The pumps & motors seem to be fine, there are no obvious loose connections, and the 4 fuses inside the controller pack test good with a meter. For some reason power is not getting to the Jets 3 pump.**

**Does the click indicate anything specific? Relay? Control pad, controller pack, circuit board, or something else? What more can I do to chase down the root cause? Thank you!**

It sounds like you are doing all the correct testing. Since you are hearing the relays click when you push the [spa control panel](#) and the fuses have checked good then I think you may have a bad [circuit board](#). The topside panel is sending the signal to the board, that is the clicking noise you hear.

**Thank you for your response. Is there any other test I can do to confirm it before spending the \$\$\$ on a new board?**

If you are comfortable using a volt meter then you can turn on the pump and once you have heard the relay click, take a voltage reading coming off the board going to the pump. If you are not getting any power and the indicator is reading correctly on the top side panel, then your circuit board is bad.

## **Topside Control Adhesive**

**I am replacing my spa pack and was wondering if there is any special caulk I should use when installing the new topside control?**

Most will come with an adhesive gasket which is like two side tape. If yours does not have a gasket, then you can use regular silicone.

## Circuit Board Repair

I have a 10yr old Hot Springs "Hot Spot" with Gecko # SSPA-1-P121 Spa Pack. The spa stopped working. Topside control is new and lights up. My new 2-speed pump that I purchased from Hot Tub Works is ok. To test the circuit board, I unplugged the topside control cable from the board while powered up. The pump is supposed to run according to a Gecko tech. It did not. It appears that the circuit board is bad. I have a difficult time understanding why the circuit board can't be tested and repaired instead of replacing the complete spa pack that Gecko wants me to do. Can I send the circuit board to you or somebody you recommend for testing? Maybe a simple relay, transformer or even the computer chip can be replaced instead of replacing the complete unit.

There are companies that will repair spa circuit boards but we do not offer this service. I would recommend a new board, if you have it repaired you may have additional failures down the road such as capacitors, other relays, etc. If you wanted to though, you can find spa circuit board repair companies online.

## Jacuzzi J-335 Heat Sensor Test

We need to know how to replace the hi-limit/freeze sensor. If I unhook this my spa runs fine but the heat is not working. If I plug in this sensor my spa pump shuts down. The wire runs into a plastic pipe which goes into the insulation on right side of tub. How do I replace and where is sensor located?

I believe you are referring to the [spa temperature sensor](#). The wire for the sensor should be in a flex pipe. The flex pipe just butts up to the back of the temp sensor. You should be able to pull that flex pipe back, it may be held on only by the foam insulation and not glued to the sensor nut. Once you pull back the flex you should expose the back side of the sensor. There will be a nut holding the sensor to the wall of the spa. The front of the sensor will either be located in the filter bucket or in the footwell area on the side of the wall.

## Best Replacement Control Spa Pack

I have a 2004 Viking II spa. Last winter (Michigan) the controls started acting up. The heater seemed like it was on all the time. No matter what you set the temp to it was 110 deg. It got to the point I just drained the spa and it has been empty for the past year. Just before that I had to put a new bearing in the pump motor. I would like to do a complete control pack and also upgrade to a second circulation pump and a new ozonator. The spa has 2 floor water intakes besides the filter skimmer. I'd like to force more water through the filter skimmer and what would be the best control pack to fit my spa?

Having the spa heater on all the time and keeping the temperature at 110 degrees will definitely result in a higher electricity bill. That may be a result of a faulty temperature sensor. The spa heater will use more power than all the other component in the spa put together. Adding a circulation pump and

having it pull or flow through the filter would help keep the water looking clearer. You would need to clean your filter more often if you choose this route. You would need to "T" off before the suction side of pump and "T" back in before the heater. The following two Balboa systems would work for you.

The [Balboa VS510 spa pack](#) is used for twin pumps and a blower, or 3 pumps. The [Balboa VS501 spa pack](#) is used for 2 pumps or a pump and blower. Both systems can operate the above plus the circulation pump, ozone, stereo, aux panel, and a 5.5kW heater. If you choose one of these Balboa packs you would need to go with the Iron Might circulation pump. Feel free to email me with more help, particular to your set-up.

## **Circuit board or Control Panel**

**Our hot tub has quit running, and it is -5 degrees overnight. Repair man says it is either the circuit board or control panel. Board is getting power, but he did not check the panel (that I am aware of). We have placed two lights inside the unit to provide warmth, and the spa water is hot and sealed pretty tightly. How can you tell which should be ordered - the control panel or the circuit board?**

I am not sure what quit working on your spa. Did the pump quit working or spa heater? Is the spa completely dead? When you push a button on the top side control panel can you hear the relays on the circuit board click or does an indicator light or symbol come on? If so that usually means the spa panel is working and sending the signals to the circuit board. I really need to know exactly what quit working on the spa to help determine which part has failed.

**My spa is completely dead. It is getting electricity; the control panel does not light up or have anything showing on it. One person said they thought the problem is the circuit board. It is a leisure bay spa, not sure of the year but we have lived in this house five years and it was here when we bought the house. I changed out all the fuses, still won't come on and it won't even let me drain it through the drain outlet.**

If comfortable with using a meter, you can check the power coming to the control panel, and see if the board is delivering any power at all. If the board is sending no power to the pump, it's likely the board that is your problem. Also check the connections and cable from board to panel, to make sure it's not damaged in any visible way.

## **Sundance Control Panel Replacement**

**We have an older Sundance spa, the control panel let go last nite now the temp is down because somebody played with it. We cannot find a serial #, but I think it's an 800 series but not sure the panels look the same. My question is, will the panels work if not exactly the same as mine don't want to spend \$500 and not have it work.**

The control panels may be different. Sundance used one style 800 panel from 1991-1993. Then used another from 1993-1999. It will also depend if your spa has one pump or two, and if it has a small remote panel. The 1991-1993 panels are not interchangeable to the 1993-1999 panel. The serial number

of the spa should be located in the equipment area of the spa on either a UL or ETL sticker, it will also show the manufacture date. They went to a completely different style panel from 2000-to present. Find the date, and we can find the board! If you can't find anything, send some pictures.

## **Circuit Board Problem?**

**I have a Leisure Bay spa that will not come on at all, not even the control panel. One guy said it was probably the circuit board because there is electricity going to everything but when you turn the breaker on nothing happens. Long before this issue came up we replaced one of the pumps (there are two pumps) and the ozone part. Everything was working well then it went off one day and never came back on. When I have tried to drain it, the water will not come out of the drain hose when I open the valve to it.**

You can turn off the power and remove the large system fuse from the fuse holder and test for continuity, you should not test while it is still in the fuse holder. Also, check any other fuses on the circuit board the same way. If you are getting the proper voltage to the spa and all fuses test good, then it is more than likely the circuit board. I am not sure why the spa is not draining out the drain hole. When you remove the cap and turn knob counter clockwise water should come out. Might be clogged with something, or plugged inside the spa.

## **Cal Spa Topside Control Panel**

**My Cal Spa V-300 topside control panel cycles from 83 to 103 and the low pump speed is always running like it is in the filter cycle. None of the buttons on the control panel work. Should I replace the TS control panel or is it very involved?**

It sounds like it may be the circuit board or temperature sensor causing it. Check both of these closely, looking for any kind of damage and checking all of the wired connections, to be sure everything is nice and tight. Also look for any kind of insect or rodent damage. Replacing the control panel is not too involved, but I think I'd start with the temp sensor, after checking all connections.

## **Balboa 2000 Panel Burned**

**When I try to turn the spa on, the electrical switch trips so I can't turn it open. I opened the Balboa 2000 panel and see that one terminal on the heating element is burned down, and also a part of the circuit board is affected. Any suggestions on how to fix this? Should I replace the heating element first? Can you suggest the part? My spa is Weslo brand.**

Yes it looks burnt at the heater terminal of the element too. I would definitely start with the element

and the copper terminal standoff strip. The circuit board may also have a burnt trace and may need to be replaced as well.

## Testing a Caldera Topside Control Panel

**I have a 2000 Caldera 9715, The topside control panel won't come on at all, no lights or digits. I have power to the circuit board. The topside has a burned chip that you can see from the back of it so it definitely needs a topside control. Is there a voltage test for the topside control so it doesn't ruin a new one if installed? Not sure if MY circuit board may be out as well!**

Not usually a way to test a topside control panel, but there may be a fuse on the circuit board to protect the topside panel, which may be shot, or need replacement. Usually the only way to test a topside panel is to plug a new one in and see if it works. Spa techs have universal test panels that they can use.

## No power to Hot Tub, GFCI tripping

**My hot tub has given me flawless performance for about 4 years, however today, there was no indications on the display and the water was only slightly warm. Testing the power, the GFCI was tripped, and trips instantly when reset. I then noticed water accumulated around one terminal of the heater - not much, but certainly noticeable, where the other terminal was dry. Could this be causing the spa GFI trip problem? The controller is a Balboa 460 Mach 3, and looks like a Balboa heater as well. Can this leak be serviced, or do I need to purchase a new element, or whole heater unit?**

The first thing you want to eliminate when you have a GFCI tripping issue is the spa heater, it's the usual suspect. You can try to tighten up the terminal bolt, (power turned off), and if the leak continues, replace the entire heater assembly, element and tube. Don't try to repair it with some sort of sooper goop, it won't work, and it could create a dangerous situation.

## Circuit Board Fire

**We have an Infinity Spa, about 5 years old. Went to get in it a couple days ago, there's no power. Check the breaker, it's tripped. This has never happened. Open up the panel, I can immediately smell that something has burnt. Looks like a small fire started at the power connection point, it looks the worst where the black wire connects. It's melted the plastic at the connection point and blackened the surrounding circuitry. I realize this thing is a goner and have located a replacement board. However, before I install a replacement, I'm keen to figure out what caused this? Don't want to put a new \$350 board in there only to have a repeat performance. The tub has worked fine for 5 years. I did replace a pump about 3 months ago, but was very careful to make sure the replacement unit has EXACTLY the same specs as the one it replaced.**

This is usually a good indication of a loose wire connection. When you install new circuit board make sure all connections are tight. Insect infestations can also cause such problems, in rare cases. Lightning

strikes or other power surges also a possibility.

## **2000 Sundance Palermo FL1 Error**

**Hello. I have been noticing my hot tub control panel has been throwing out some crazy characters lately. A breaker reset fixed the problem, until the other day i got the FL1 error. I drained the tub and refilled, left the filter out and still get FL1. The "two speed" motor will only work on high speed. I hear a click when it tries to cycle on low but i get no motor. It's a 2hp waterway pump with one capacitor. Can i safely say the motor and cap are good?**

Yes, it sounds like motor is good but you may have an issue with the circuit board. I don't have a wiring diagram for this circuit board but there should be one on the controller door. Sundance will usually use 220V motors but confirm that on label on the motor. You need to locate low speed relay and test at the wires going out for voltage when low speed should be on.

**I fixed this problem myself! After testing the circuit board with a multimeter, I found there was no power at the low speed terminals. I got the number off of the low speed relay, and ordered that relay from Digi-key.com. De-soldered the old one out and soldered the new one in and boom - it's up and running again!**

## **Cal Spas Control Panel Problem**

**Hi, I'm having a problem with a 2003 Cal Spas topside control panel. The buttons don't work on the panel, the display does seem to work and the spa stays at temperature and cycles thru the filter modes. When I cycle power to the spa the buttons will work for a couple of pushes then stop working. When this happens the motor running icons on the display will freeze in one state (they usually change to look like a running motor). Is there any way to make sure the problem is on the topside panel and not the main board before I buy a replacement?**

Really the only way to test a topside panel is to plug a new one in. Since the pump is coming on for filter cycles and not when you push the button I am leaning towards the topside as the issue. A ten-year lifespan on a well-used topside panel is not uncommon. If you need help finding your exact replacement, please contact us.