



VEBKO ONLINE HELP

Checking the Parts,in Switching Module Errors Part3

Category	tester
Section	Troubleshooting
Language	English
Generated	2026-10-18

In the switching module, when switch number two is connected, we get an Overcurrent error of board two. According to our previous explanations, we need to proceed step by step to find the problem. In the first step, we replace the command module with the command of the incomplete side to see whether the command is causing the problem or not. Before doing this, we need to turn the device off. Then we replace the modules. Since we have already connected switch number two, it does not really matter if we connect the command of the incomplete side because we cannot activate switch number one. Then we turn the device on and connect to it. You can see that even by replacing the commands, the error still persists. We turn the device off again and open the Main Switching of the complete side.

As mentioned before, we open all screws of the modules and then Main and completely detach the Main from the module. Then we test the IGBTs. To do this, we set the multimeter at diode test mode and test the IGBTs one by one, as explained before. Bases two and three must show the value of 0/4 in one side in the diode test and it must be Overloaded in the other side. Most probably the IGBTs are damaged because all of the four IGBTs are damaged in the test and to make sure of this, we need to remove the IGBTs from the circuit and repeat the test. To remove these IGBTs, we detach the Incomplete Main Switching so that the switching module is easily put on the desk.

These IGBTs must be tested one by one. On these IGBTs, there is a holder that is tightened on the body of the heat sink by five screws. Before melting the tin of the bases of the IGBT, we need to open these screws and detach the heat sink a little and put these insulations that are located between the IGBT and the heat sink on the body of the heat sink. Then, by adding the extra tin on the bases of the IGBT and holding the soldering iron at this point, remove the IGBT from the module. Then we test it and we can see that this IGBT is short-circuited. Then we test the next IGBT on the board and this one is short-circuited as well. So we remove it and test it again which does not change the result and it is still short-circuited.

Usually, in over voltages that are applied, it is possible that all of the IGBTs get damaged, and here only the IGBT number four is healthy and the rest are damaged. Then we assembled the healthy IGBTs on the board. When we removed the IGBTs from the circuit, inside the pads got filled with tin. Using a desoldering suction, we remove the tin inside them so that we can easily install the parts. By holding the soldering iron on the pad, its tin melts down and then we can easily remove it using the desoldering suction. Then, after removing the tin, we install the healthy IGBT until the last part like this and then we fix it by adding some tin. Following the same procedure, we remove the tin from the pad of the next IGBT and install the part in its place.

After replacing the damaged IGBTs, as you can see, we emptied the pads, installed the IGBTs and then filled the bases with tin. In the end, we fix the holder that is placed over the IGBTs. After fixing the holder, we need to take a IGBTs connection test (drain base) with the body of the heat sink which is the same as the ohm test where none of them has body connection. Finally, we put the incomplete Main Switching and along with its command module and the complete Main Switching in their places. Then we connect the connection flats and electricity cable of every part. By turning the device on and

activating switch number two and clearing the error, the series lamp turns on for a moment and then turns off which means that there is no problem. After that, we check the output voltage of the side that had an issue. Then we take a test between the eight-pin external phoenix and the eight-pin internal phoenix which should give 23 to 24 volts as the result. So the problem with this module was that three of the IGBTs on the switching module were burned out and by replacing them, the problem was solved and the output voltage is correct.

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