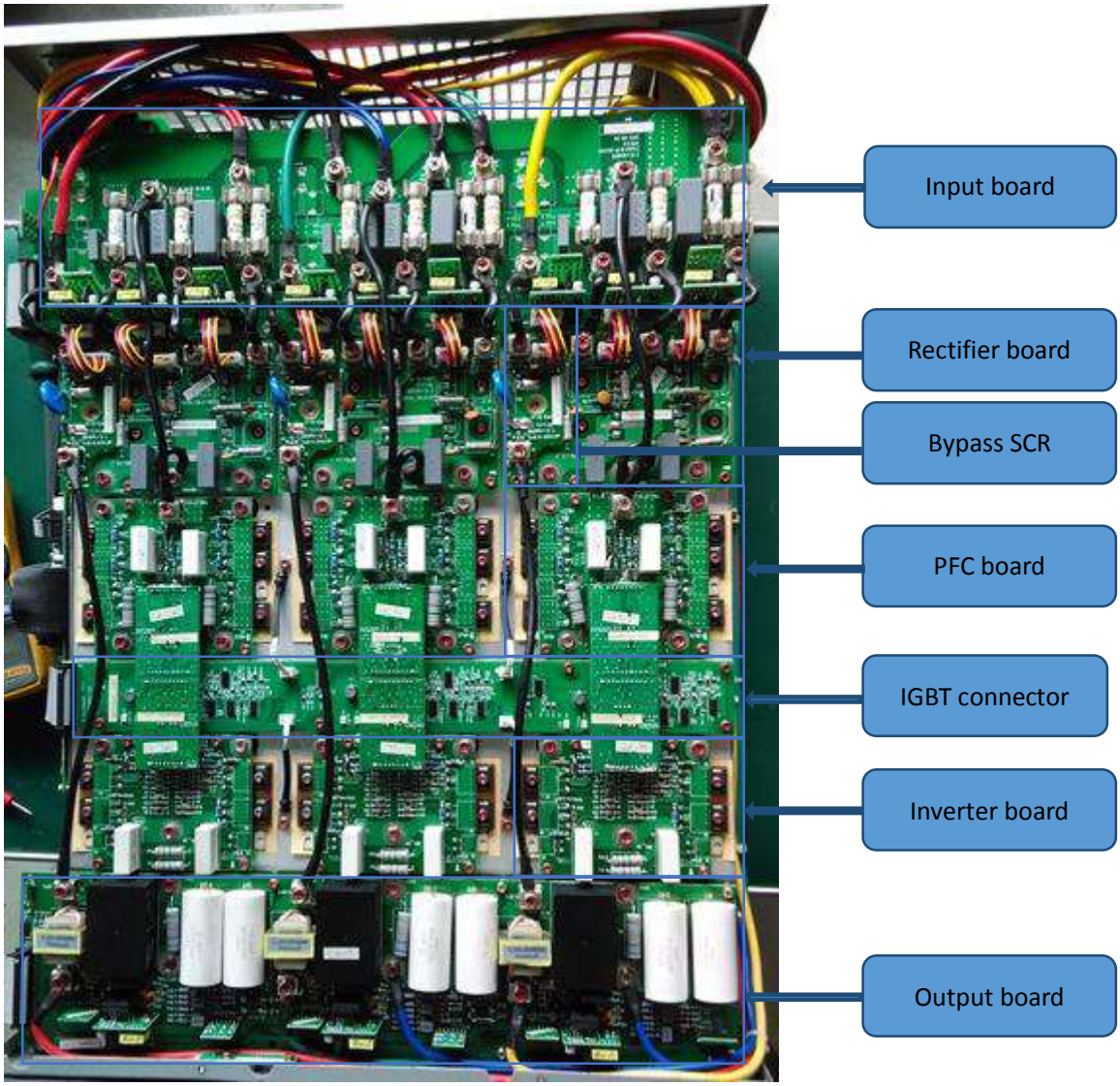
Power module repairing guide

1. **Hardware check：** open the module cover, have a cold check whether any PCB or components burned obviously. Then use the mutimeter to check whether any main components failure or not?



Because different power range, the PCb may can't share，the following PCB code for reference：

Rate power	10KVA	20KVA	30KVA
Input pcb	C. 42. 4166803	C. 42. 4166802	C. 42. 4166802
Rectifier pcb	C. 42. 4166302	C. 41. 4166300	C. 41. 4166300
Bypass pcb	C. 42. 4168200	C. 42. 4168200	C. 42. 4168200
PFC pcb	C. 42. 4166402	C. 42. 4166403	C. 42. 4166401
Inverter pcb	C. 42. 4166501	C. 42. 4166500	C. 42. 4166502
Output pcb	C. 42. 4166900	C. 42. 4166900	C. 42. 4166901
LC pcb	C. 42. 4167103	C. 42. 4167104	C. 42. 4167102
Power connector	J. 2S. 0065200	J. 2S. 0062900	J. 2S. 0062900

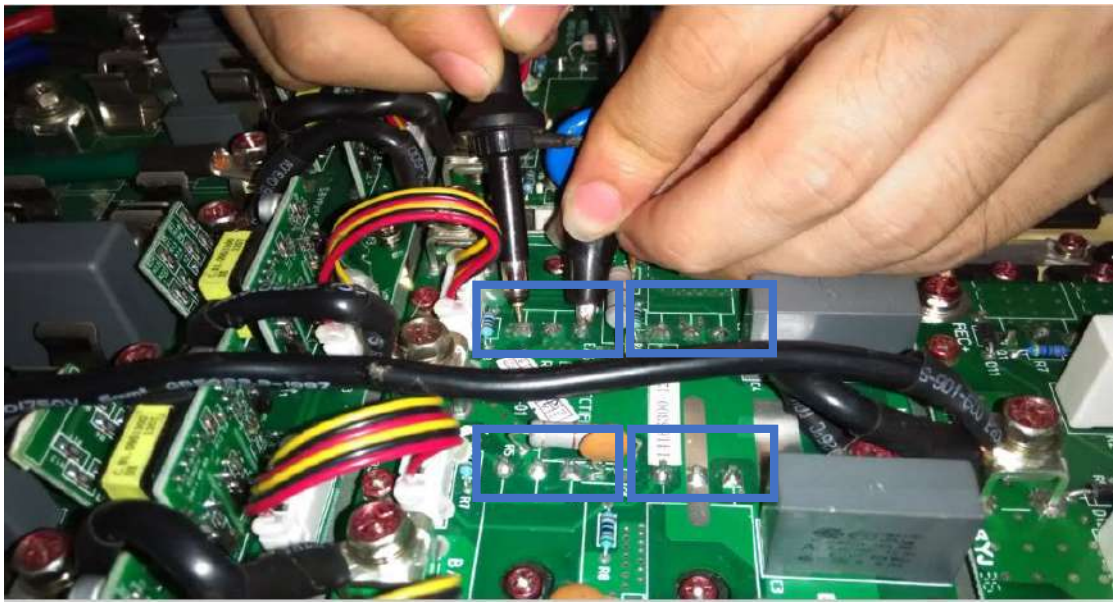
	J. 2S. 0065100	J. 2S. 0063000	J. 2S. 0061900

2. **Driver wave testing：** sometimes we can't use the multimeter to check whether all the PCB are good or not, we need to use the DSP board which sign "PWM ON" with the testing program, usually we name it the "testing DSP board"

1）Use the "testing DSP board" to replace the main control DSP board.

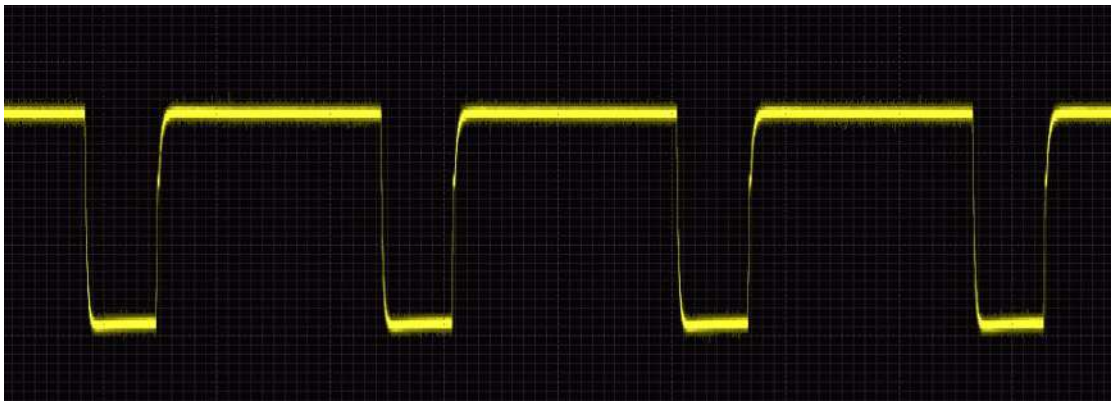
2）Remove all the fuse in the module，then connect the 4 AC input cable to the input board's terminal depend on the phase sequence. But the AC input breaker shall be off. As followings.

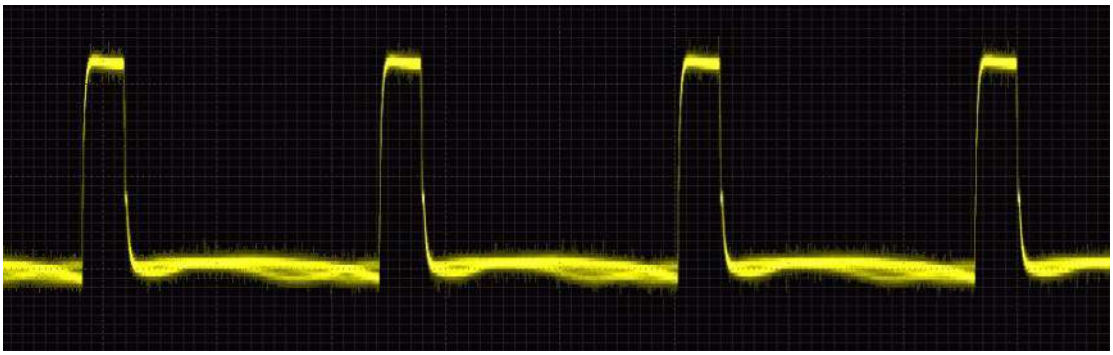
3）put on the AC input breaker, use the oscilloscope to test the rectifier board's SCR driver waveform. And the power module have "R","S","T" three phase, each phase have a rectifier board, and each rectifier board have 4pcs SCRs. Use the oscilloscope probe to test the waveform between "G" and "K", as followings：



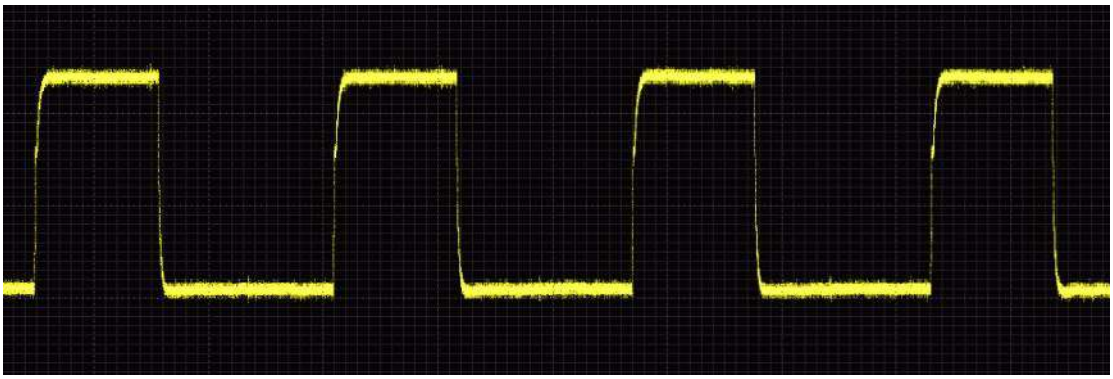
SCR normal driver waveform as followings:

4）Test the PFC board and inverter IGB driver waveform。Each module have “R”,”S”,”T” three phases，and each phase have one PFC board and inverter board, and each PFC board or inverter board have 4pcs IGBT. Use the oscilloscope probe to test the waveform between IGBT’s “G” and “E”, and the IGBT normal driver waveform as followings(the peak to peak voltage is about 23V)：





Inverter board normal driver wave as followings:(and the peak to peak voltage is about 23v)



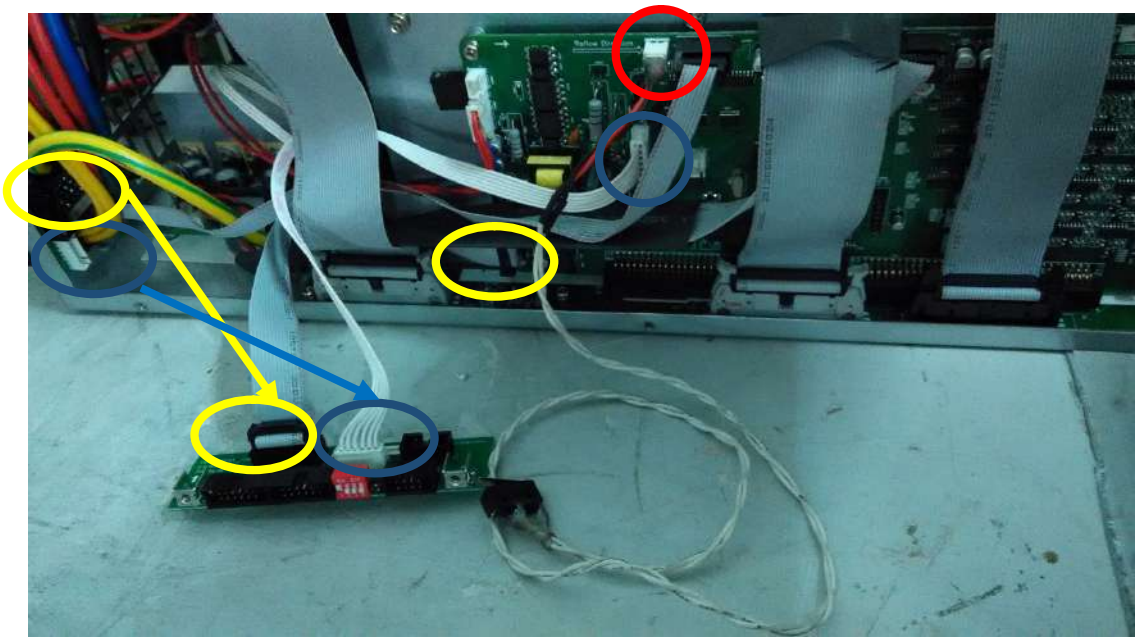
If the waveform abnormal, need to replace the abnormal pcb with a new one. Also replace the IGBT driver pcb at the same time. If the problem still can't be solved, also replace the IGBT connector. Caution: you must switch off the AC input breaker and discharge the voltage then you can go ahead to replace the PCBs.

3. Module testing：

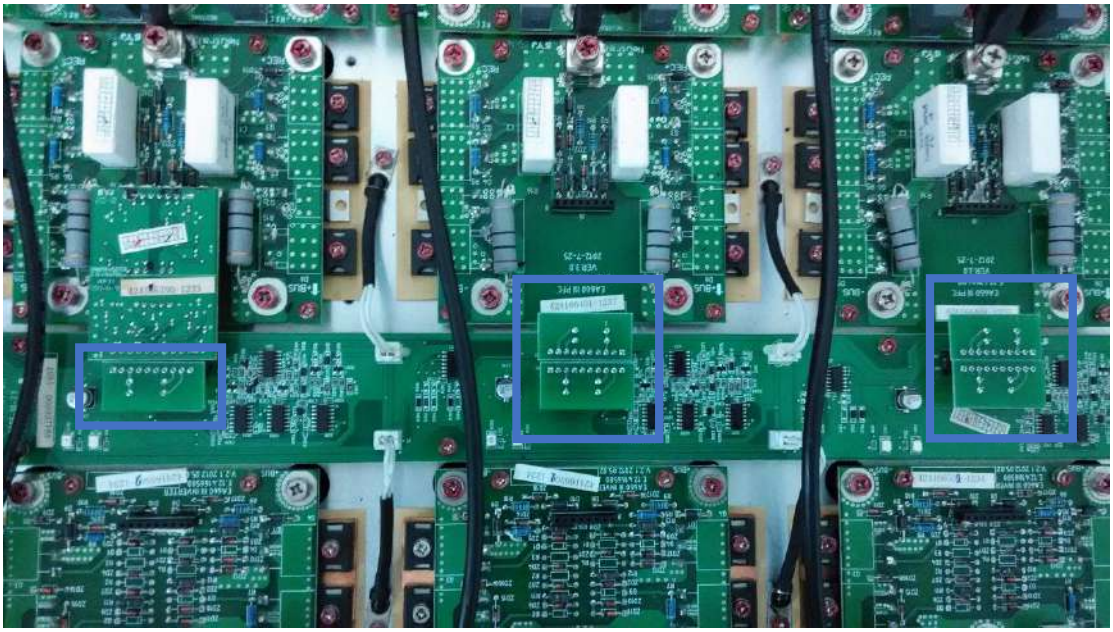
1） Turn off the AC input breaker, install back one input fuse the input board phase "R","S","T". as following:

2） Replace the "testing DSP board" with the normal main control DSP board, and in the main control DSP board, it have two cable insert terminal which are CN005、CN007 and CN007 connect to the rear cable connection terminal, please remove it off from the other side of cable connection terminal, then connect to the connector board which our company sent to you . as the following, yellow color and wathet blue. And add a controllable switch to the CN011 which one normal status is open also can help to turn on the module, if you have not this type switch, you also can use a jumper, as the

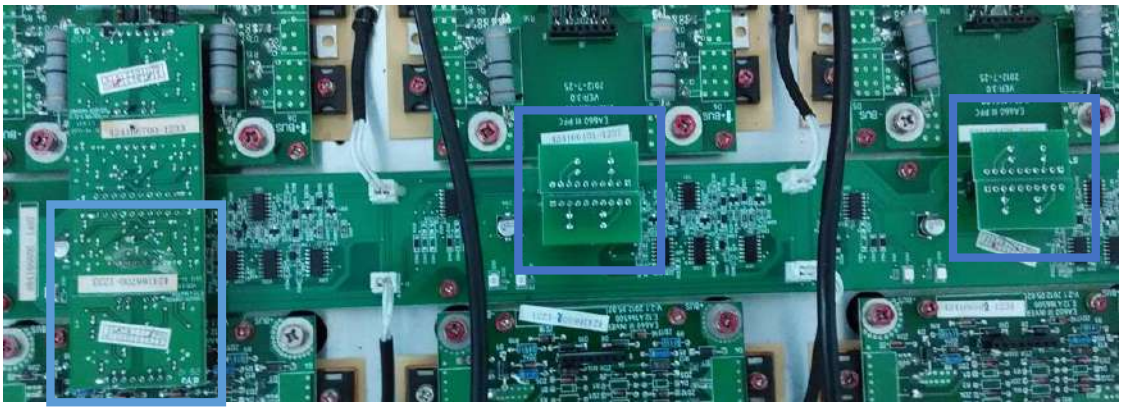
following picture in red circle shows.



3） Single Phase testing . test the T phase PFC whether is normal or not? Firstly use the “signal shield board” which the our company sent to you to instead of the phase “R” and “S” PFC and inverter driver board, also replace the phase ”T” inverter driver board with the “signal shield board”, use two multimeters’ probe to test at the PFC +/-. Then turn on the AC input breaker, press the controllable switch which one have been connected to the main control board’s CN011 for about 2 seconds. Or directly use the jumper to short connect the CN011 to turn on the module. If the module is normal, after turn on the module, we can see there the +/- BUS voltage goes up slowly until reach to about 360VDC.



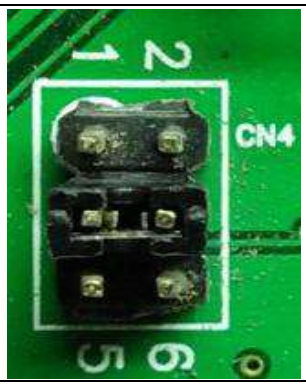
4） Then turn off the AC input breaker, use the discharge tools to discharge the +/- BUS voltage low to 5V. and test the phase “T” inverter part whether is normal or not? Test as following: replace the phase “T” “signal shield board” back to the normal IGBT driver board, then turn on the module to check whether the phase “T” have inverter output voltage or not?



5） Turn off the AC input breaker, use the discharge tools to discharge the +/-BUS voltage ba low to 5v. then repeat the step 3) and 4) to test the phase R and S to check whether are normal or not?

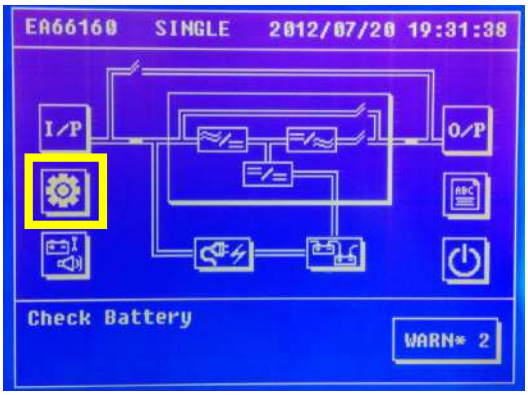
6） If each phase are normal, then recover the module (recover the fuses, the cable connectors, driver boards), and get ready to put it back to the UPS cabinet to test.

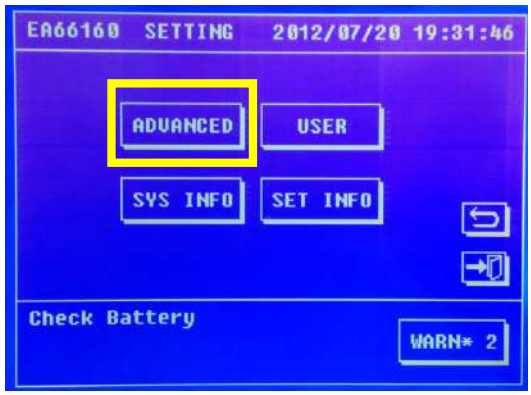
7） Because of the main control board can be shared in different power rate, if have replaced the main control board, please check the main control board capacity setting is the same as the beginning or not. Please check the main control board rate power as the CN4 jumper setting as the following list.

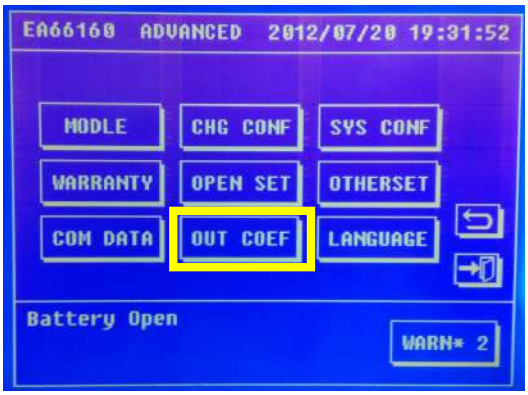
10KVA	15KVA	20KVA	30KVA
			
Pin1,2 short connect	Pin3,4 short connect	Non short connect	Pin5,6 short connect

4. The whole UPS System testing:

1） Adjust the inverter output voltage, insert the power module back to the module slot, switch on the rectifier breaker, after the LCD screen light up, click the “setting” →”ADVANCED”→ “OUT COEF” →”choose the corresponding module”, After click the corresponding module, it have two choices , one is “inverter output voltage set” which can help to adjust the inverter output voltage, and need to set it to around 221V±0.1V another one is “out voltage set” which can help to adjust the display voltage in LCD screen, need to adjust the voltage show in the LCD screen shows around 221V±0.5V.







2） Finish setting, click back to the LCD home page, then click the system “power on” icon. Click and turn the system to inverter mode, and take the different percent load at 20%, 40%, 60%,80%,100%, at the same time, check the output voltage whether is a little lower as the load percent goes up, then turn the ups to different working mode and make sure are normal, then take 50% load to keep the system working for about 30mins,if normal. Then finish all the testing, we can put this module back to store.

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