

## REPAIR GUIDE FOR COMMON PROBLEMS FOUND WITH BSU2 50B / SSU2 50B



### PLEASE NOTE

**All repairs must be carried out by a qualified person.**

**Before repairing please ensure that the MPL unit is disconnected from both the mains supply and the battery.**

**High risk of electric shock.**

### CONTENTS

1. No Power (LED1 fails to come on)
2. No Connection (LED 2 does not light)
3. No Relay On (LED 1 and 2 light, but LED 3 does not)
4. Relay On, No Increase In Power (LED 1,2 and 3 light)
5. Unit Overheats

## 1. NO POWER (LED1 FAILS TO COME ON)

1. Disconnect mains power and croc-clips from unit.
2. Remove fuse from mains plug and check, using a multimeter.
3. Remove the 8 rivets holding the lid in place.
4. Remove the 4 screws holding the PSU onto the base.
5. Check continuity of E, N, and L (figure 2, figure 3), using a multimeter.
6. PAT test unit. An instruction to check connection may indicate the PSU internal fuse has blown.
7. VERY CAREFULLY re-power the unit, and using a multimeter check AC voltage between N and L on the PSU (figure 2). As there are no screws holding the PSU in place it may move around, so be EXTRA careful not to short the AC power coupling, and be VERY sure that no AC wiring has become exposed.
8. Check to see if the PSU on LED is lit.
9. CAREFULLY check the DC voltage between A1 and A2 on the control board, using a multimeter.
  - If the voltage is between 13.7 – 13.9v this indicates a fault on the control board, possibly the LED itself has broken. If all other LEDs come on, when connected to a battery this is the most likely explanation.
  - If the voltage is between 11.5 – 12.5v try turning the PSU voltage regulator clockwise to raise the voltage. If this doesn't work, TURN OFF UNIT and go to STEP 10.
  - If there is no voltage TURN OFF UNIT and go to STEP 10.
10. Using a multimeter check continuity of A1 and A2 between the PSU and control board (figure 1, figure 2). If the short still exists replace the control board.
11. CAREFULLY re-power the unit and check voltage between A1 and A2 on the PSU.
  - If there is no voltage / low voltage TURN OFF UNIT and go to STEP 12.
  - If the voltage is between 13.7 – 13.9v TURN OFF UNIT, and remove the control board bracket, from the PSU. Check the wires haven't frayed, and check the control board tracks for breaks.

12. Remove A1 and A2 from the PSU.

13. CAREFULLY re-power the unit and check voltage between + and - on the PSU.

- If the voltage is now 13.7 – 13.9v this indicates that there is a dead short on the control board and it should be replaced.
- if there is no voltage / low voltage TURN OFF UNIT and go to STEP 14.

14. Remove RL1 and AN- from the PSU.

15. CAREFULLY re-power the unit and check voltage between + and - on the PSU.

- If there is no voltage / low voltage is PSU is faulty and needs replacing.
- If the voltage is normal there is a short between RL1 and AN-. Go to step 16.

16. Check for a short between the Anderson connectors + and – terminals, using a multimeter.

- If a short exists and no physical link can be found between the points, replace the relay and retest. If after replacing the relay the short still exists replace the control board.
- If no short exists replace the relay and retest. If the unit still fails replace the control board.

## 2. NO CONNECTION (LED 2 DOES NOT LIGHT)

1. Disconnect mains power and croc-clips from unit.
2. Remove the 8 rivets holding the lid in place.
3. Plug croc- clips into the Anderson connector.
4. Connect the croc-clips to a 12v battery.
5. CAREFULLY measure the voltage between C1 and C3 on the control board.
  - o If the voltage is below 12v, go to STEP 6.
  - o If voltage is above 12v, this indicates a control board fault. If LED 3 lights up when turned on, and connected. LED 2 has probably blown / broken.
6. Remove the croc clips from the unit, but keep them connected to the battery. Measure the voltage at the end that was previously attached to the unit.
  - o If the voltage is below 12v the battery or the croc-clips are faulty. Check the battery voltage is good, and then use a multimeter to check the resistance is low between both ends of the croc-clips.
  - o If the voltage is good, check continuity on C1 and C3, between the Anderson connector and the control board (figure 1, figure 4).

## 3. NO RELAY ON (LED 1 AND 2 LIGHT, BUT LED 3 DOES NOT)

1. Recycle power to SSU2/BSU2.
2. Disconnect mains power and croc-clips from unit.
3. Remove the 8 rivets holding the lid in place.
4. Replace control board.

## 4. RELAY ON, NO INCREASE IN POWER (LED 1,2 AND 3 LIGHT)

1. Disconnect mains power and croc-clips from unit.
2. Remove the 8 rivets holding the lid in place.
3. Check wiring associated with the relay (figure 4). Particularly C3 to the relay.
4. If wiring is in good condition replace the relay.

## 5. UNIT OVERHEATS

1. Disconnect mains power and croc-clips from unit.
2. Check croc-clips for signs of damage, and overheating.
3. Check the resistance of the croc-clips with a multimeter. ( $<1R$ )
4. Remove the 8 rivets holding the lid in place.
5. Check for damage and rust on the PSU. If the units has overheated, it may well have a burnt odour.
6. Check the unit Anderson connector for signs that the connectors have made a bad joint, and overheated.
7. Power up the unit and connect the croc-clips to a battery.
8. Check the fan on the PSU runs freely.
9. Apply 60A (0.25R) Of resistance across the battery, and check the fan compensates by running faster.
10. Run for at least 40 minutes, if the PSU overheats it should automatically shutdown.

## APPENDICES

figure 1- control board

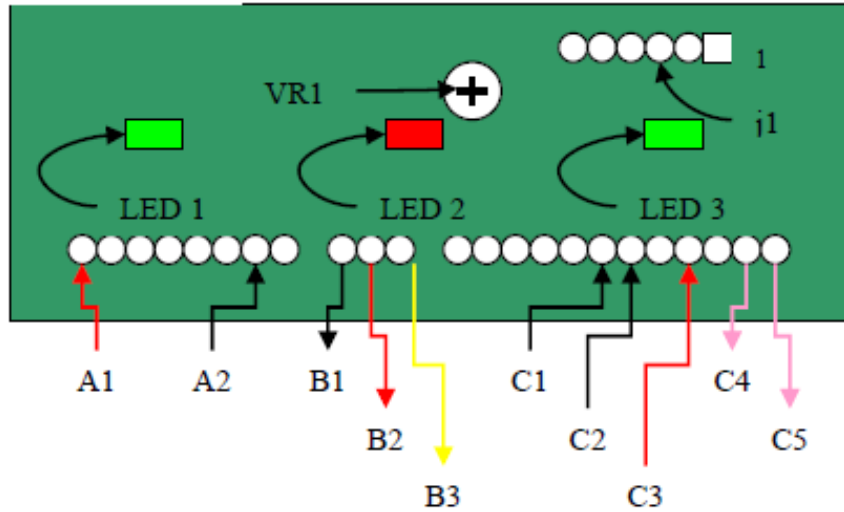
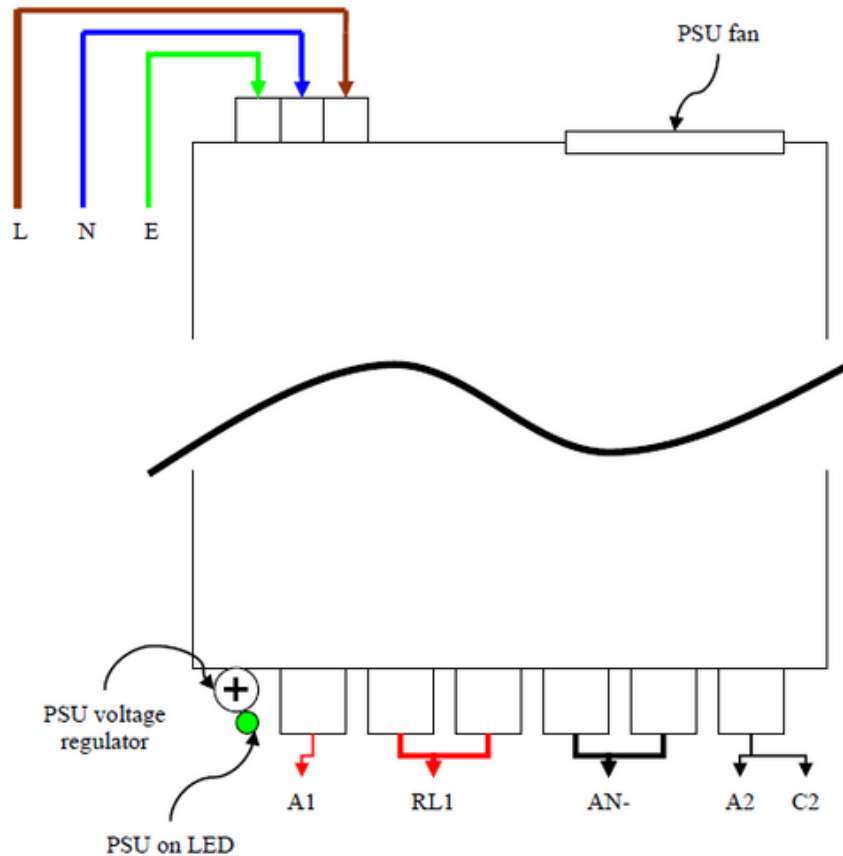


figure 2- PSU wiring



## APPENDICES

figure 3- mains wiring

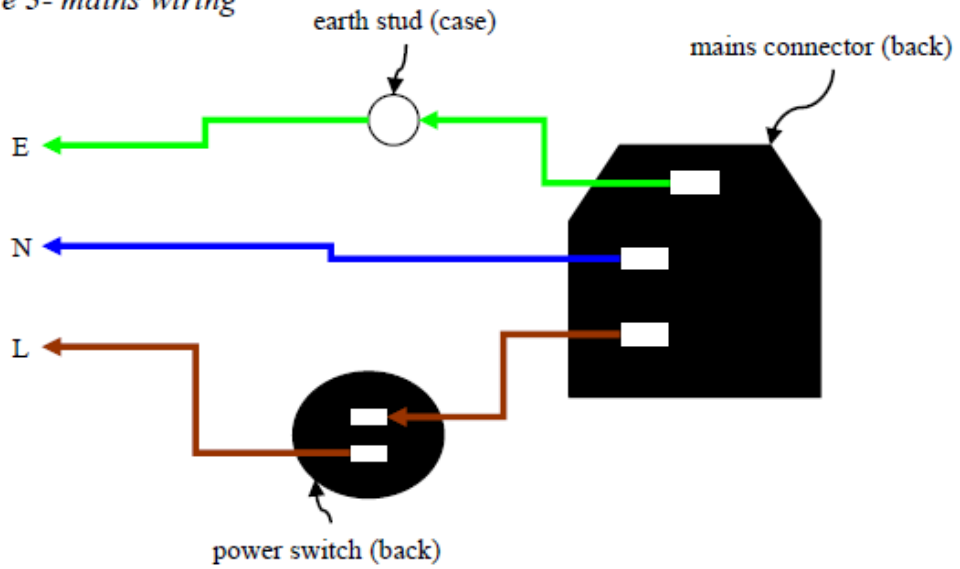


figure 4- relay to Anderson connector wiring

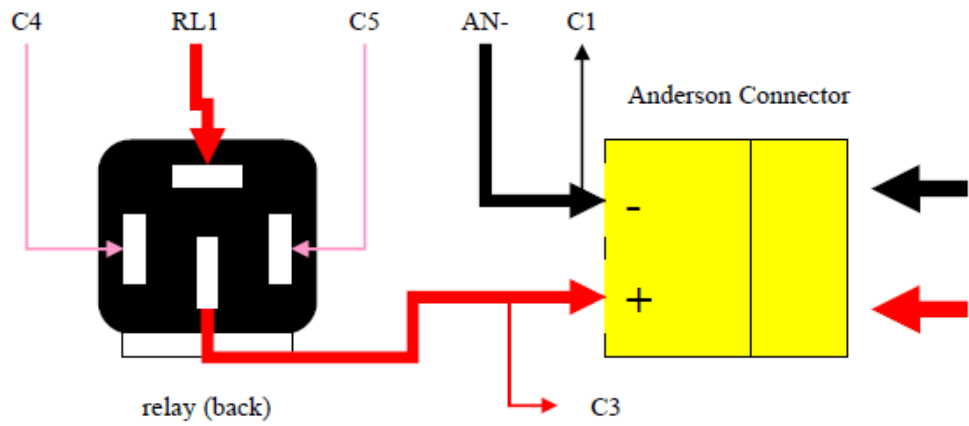


figure 5- display wiring (back)

