# How to diagnose the PCBA and motor

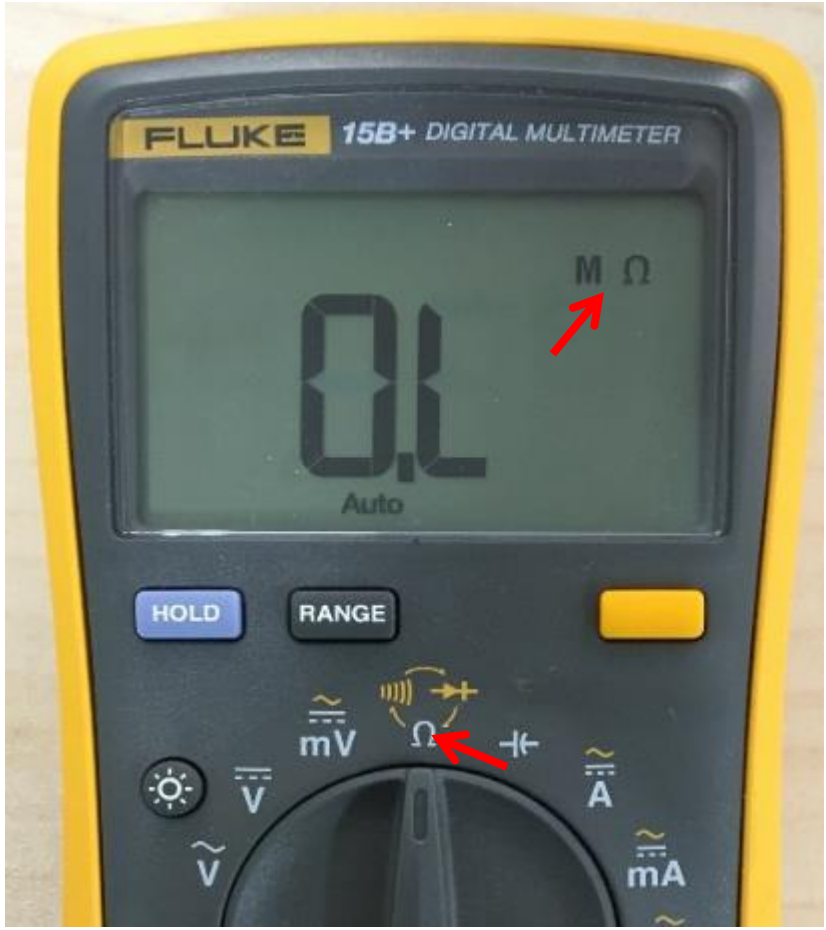
**NOTE:**

1. The main motor and self-propelled motor share the same diagnosis.
2. The main PCBA and self-propelled PCBA are in the similar diagnosis while the BMS PCBA is different. .

*Draft by Nicole Zhang*
*Date 2020/09/30*

# How to diagnose the motor

1. Test the motor resistance between the three wires by using a multimeter.

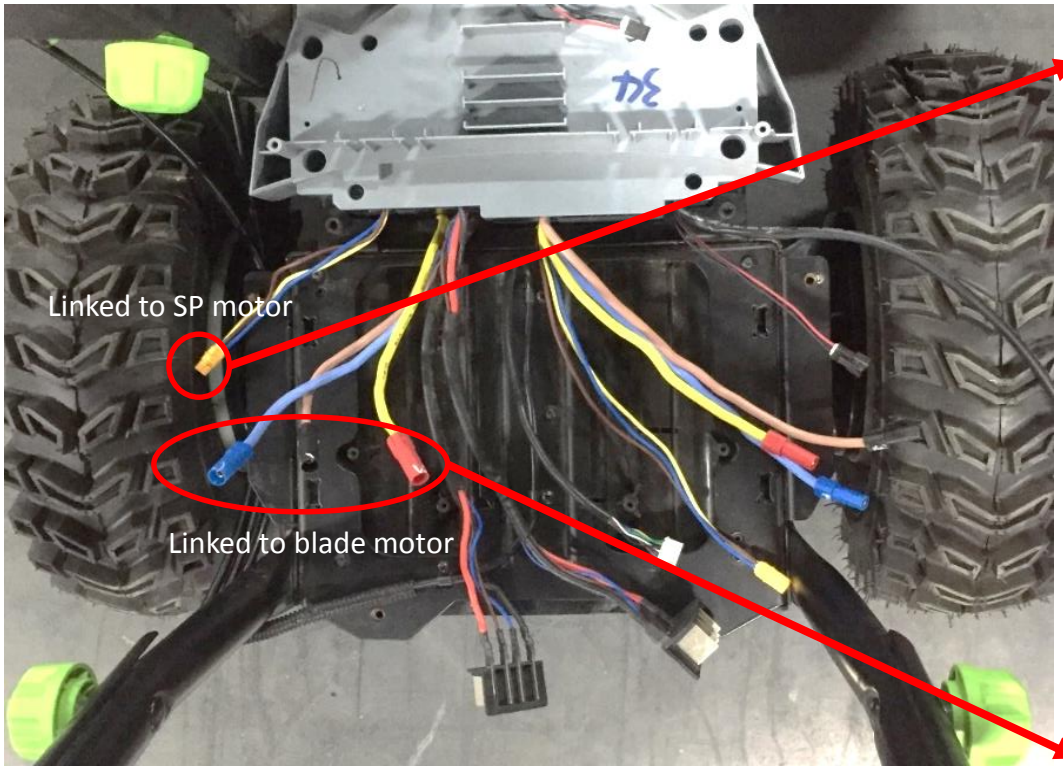


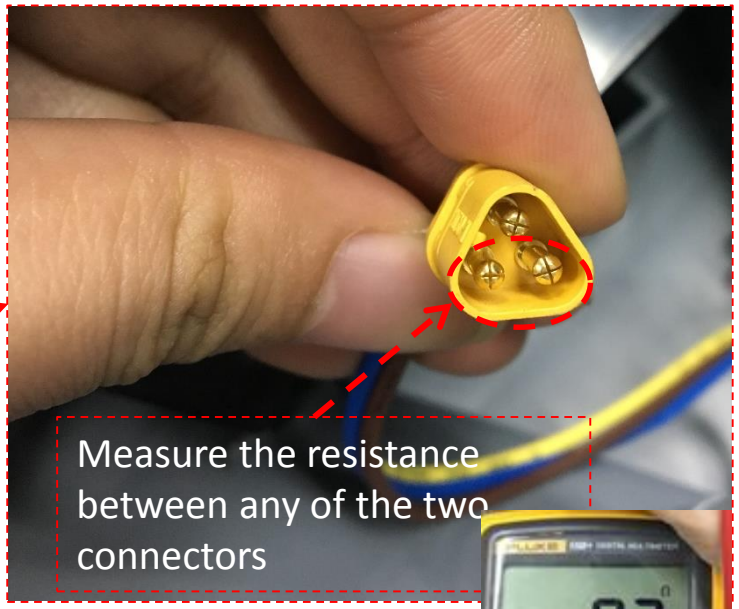

a) Set the multimeter function to “Resistance measuring” .

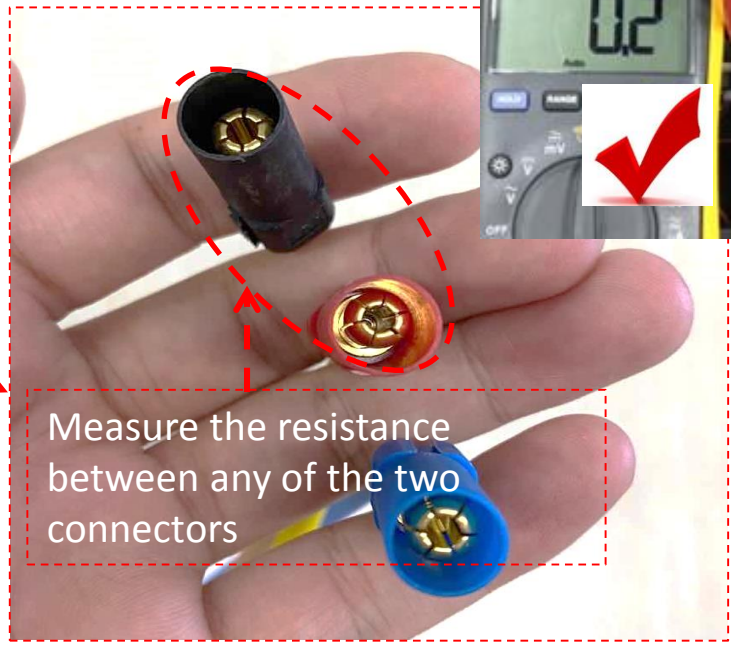
b) Measure the resistance between any of the two connectors.

c) If any of the measurement are infinite, it means the circuit between the two connectors is an open circuit, the motor is damaged. Replace the motor.

# How to diagnose the motor

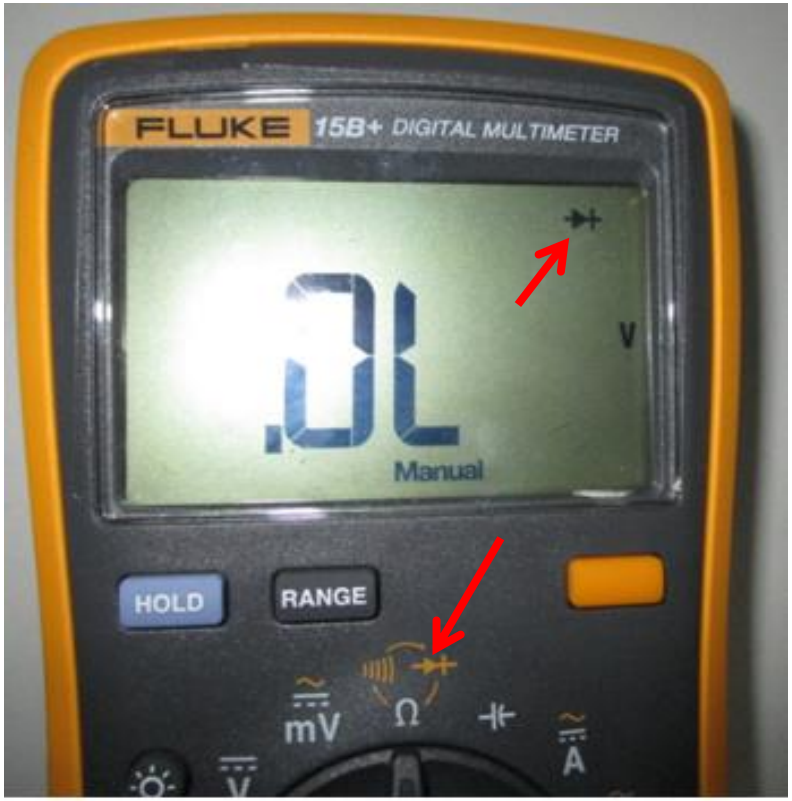


# How to diagnose the BMS PCBA

1. Measure the BMS PCBA(Step 1) .



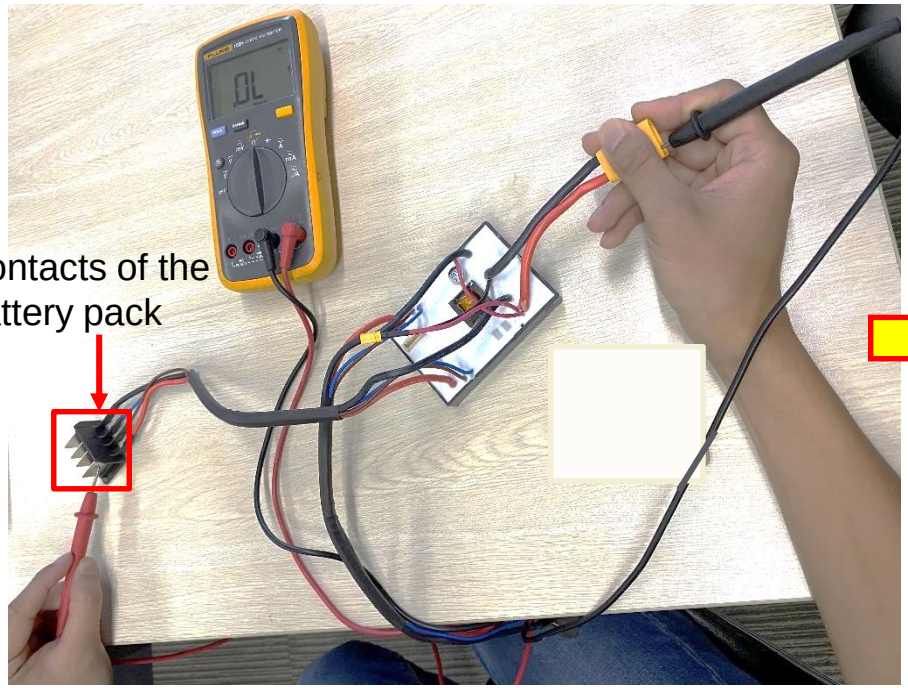

a) Set the Multimeter function to “Diode measuring”.

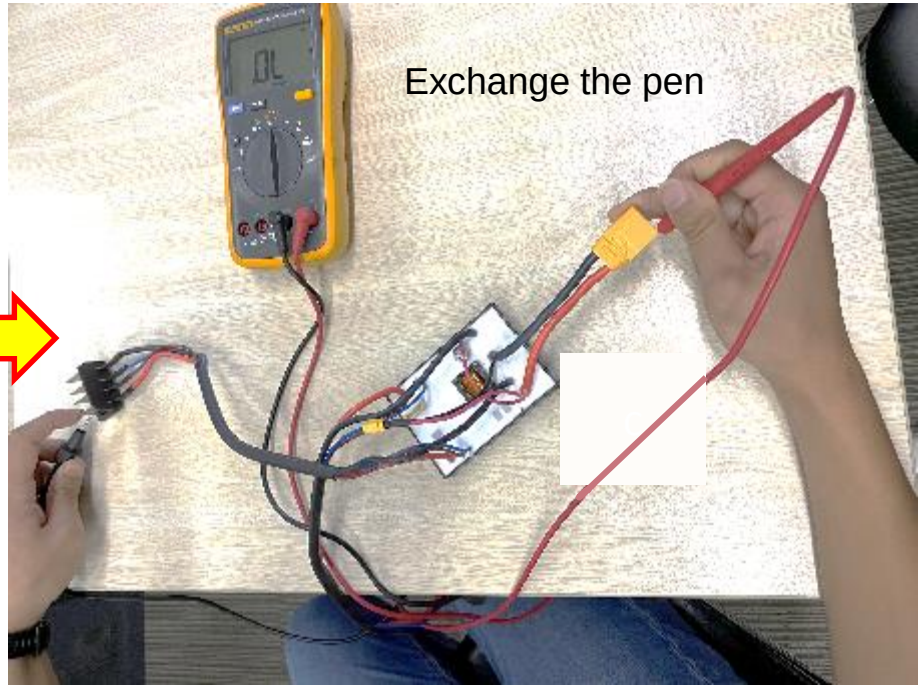
b) Contact the black pen pin to the POSITIVE contact (RED) with the yellow connector (connect to the wiring harness) and the red pen pin to the RED terminal contact (POSITIVE) of the battery pack, then exchange the two pen pins for second measurement.

c) The same measurements for the other contact of the battery pack.

d) If the LCD displays .OL (see next slide), go to next steps, otherwise means the MOSFET in the BMS PCBA is broken. Replace with a new BMS PCBA directly.

# How to diagnose the BMS PCBA

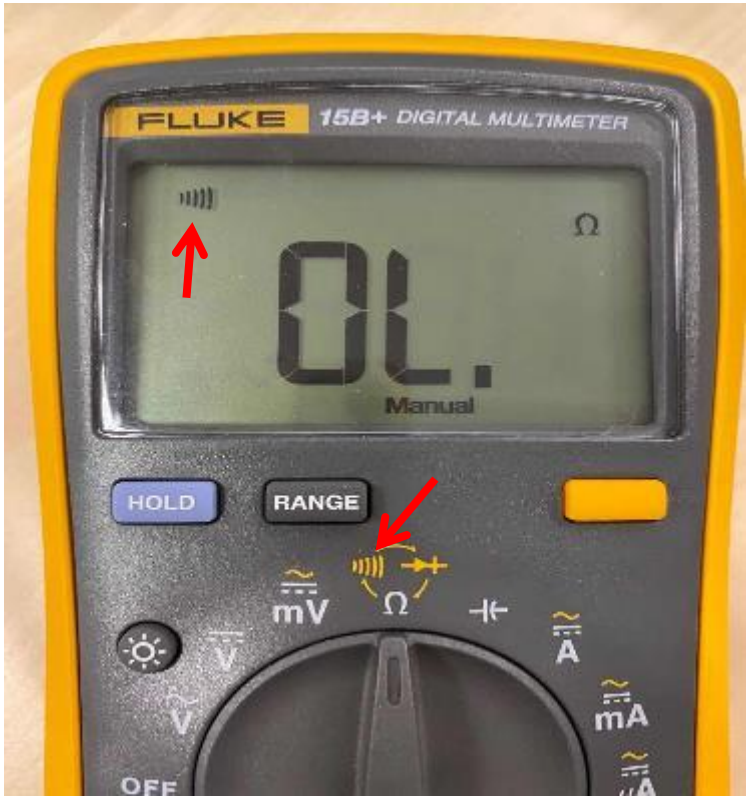



**NOTICE:** The same measurements for the other contact of the battery pack due to the snow blower is equipped with two battery compartments.

# How to diagnose the BMS PCBA

2. Measure the BMS PCBA(Step 2) .



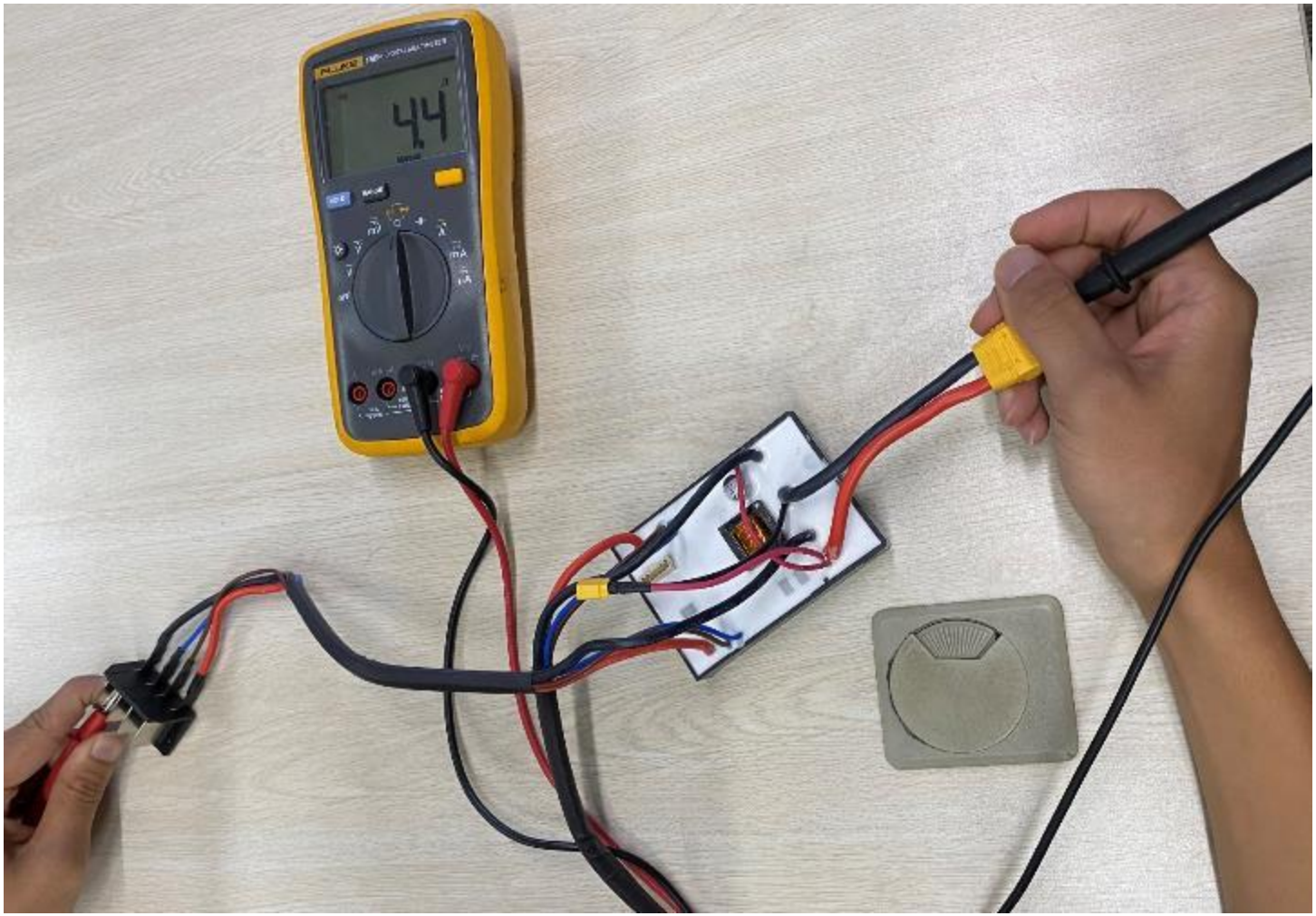

a) Set the Multimeter function to “Buzzer measuring” .

b) Contact the black pen pin to the NEGATIVE contact (BLACK) with the yellow connector (connect to the wiring harness) and the red pen pin to the BLACK terminal contact (NEGATIVE) of the battery pack.

c) The same measurement for the other contact of the battery pack.

d) If the Multimeter emits **beep sounds for both measurement**, means the fuses in the BMS PCBA are good, otherwise the BMS PCBA is broken (fuse is broken). Replace with a new BMS PCBA.

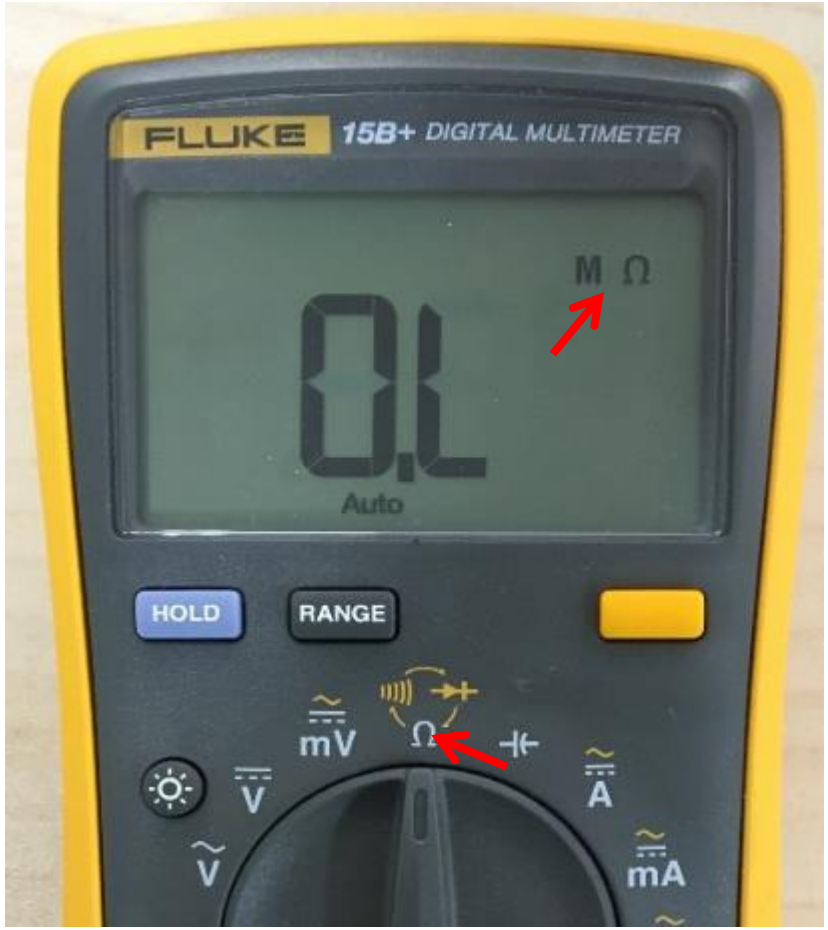
# How to diagnose the BMS PCBA




**NOTICE:** The same measurement for the other contact of the battery pack due to the snow blower is equipped with two battery compartments.

# How to diagnose the main PCBA

1. Before testing PCBA with a Multimeter, the capacitor should be discharged, otherwise the result will go wrong.

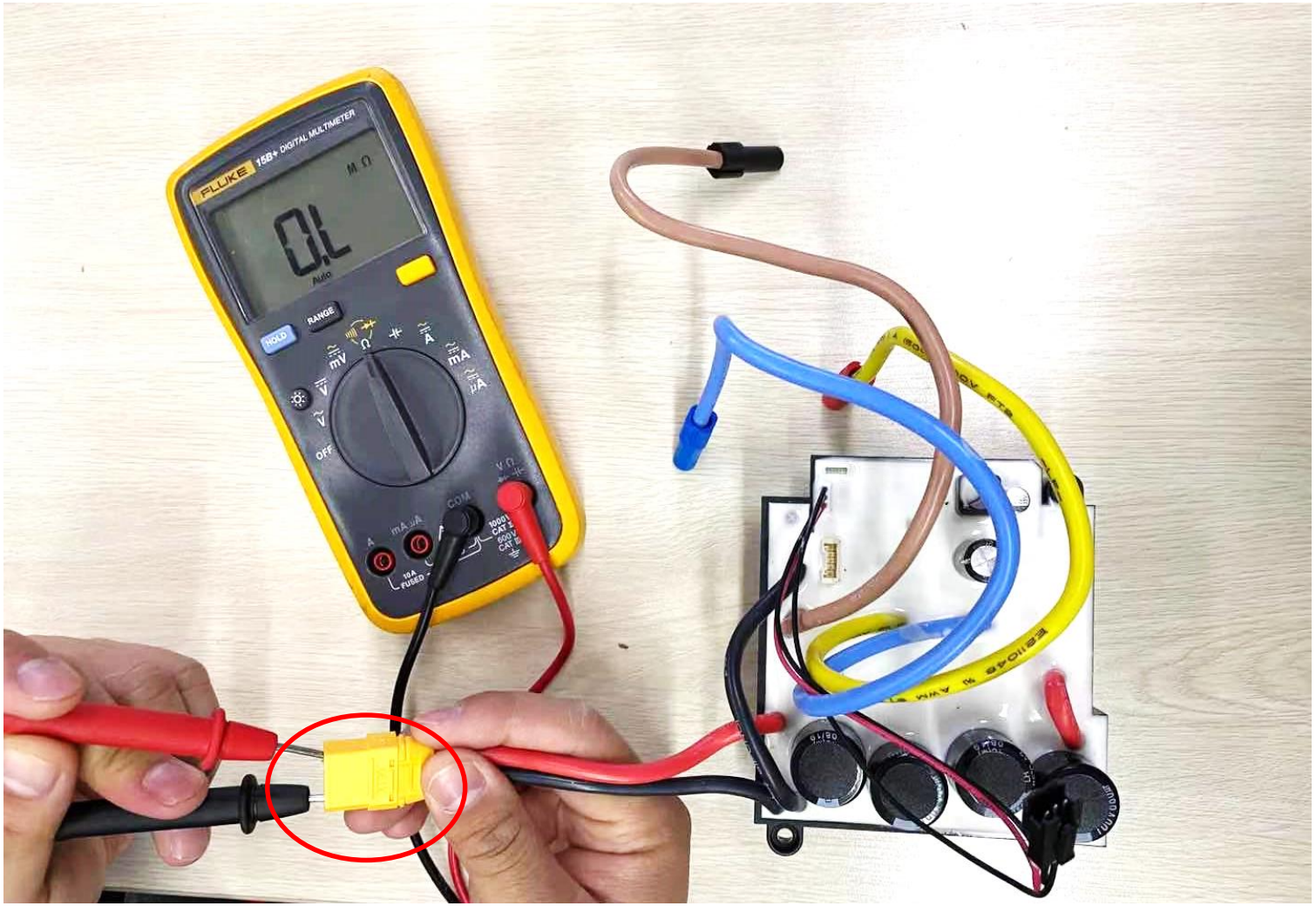



a) Set the multimeter function to “Resistance measuring” .

b) Use the red pen and the black pen to contact the terminals of the yellow connector, hold it for 5~10 seconds(see next slide).

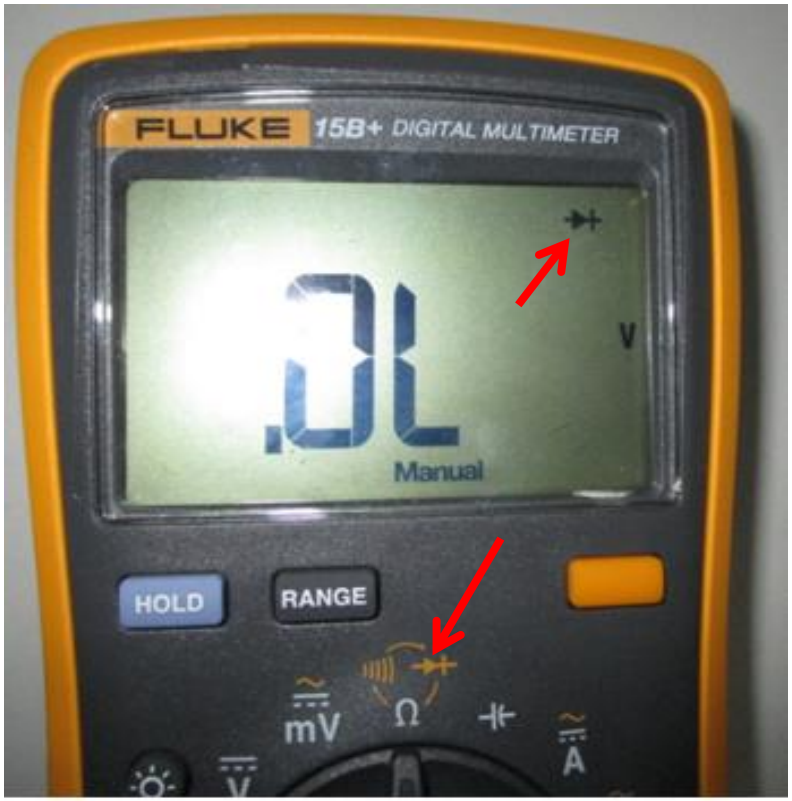
c) When the value displayed is 0L., the discharging process is finished.

# How to diagnose the main PCBA



# How to diagnose the main PCBA

2. Measure the main PCBA .



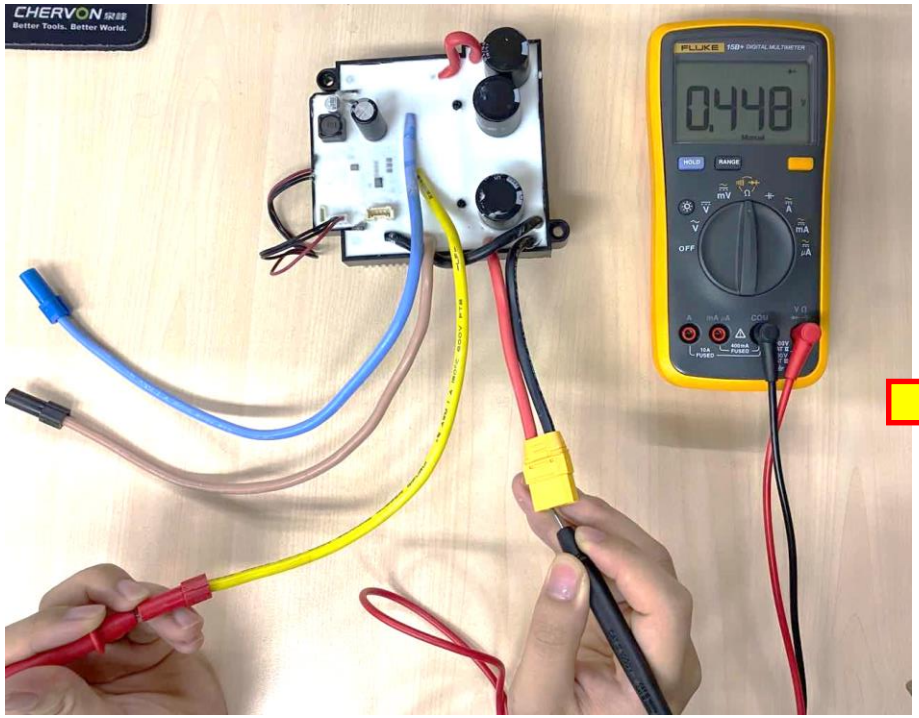

a) Set the Multimeter function to “Diode measuring” .

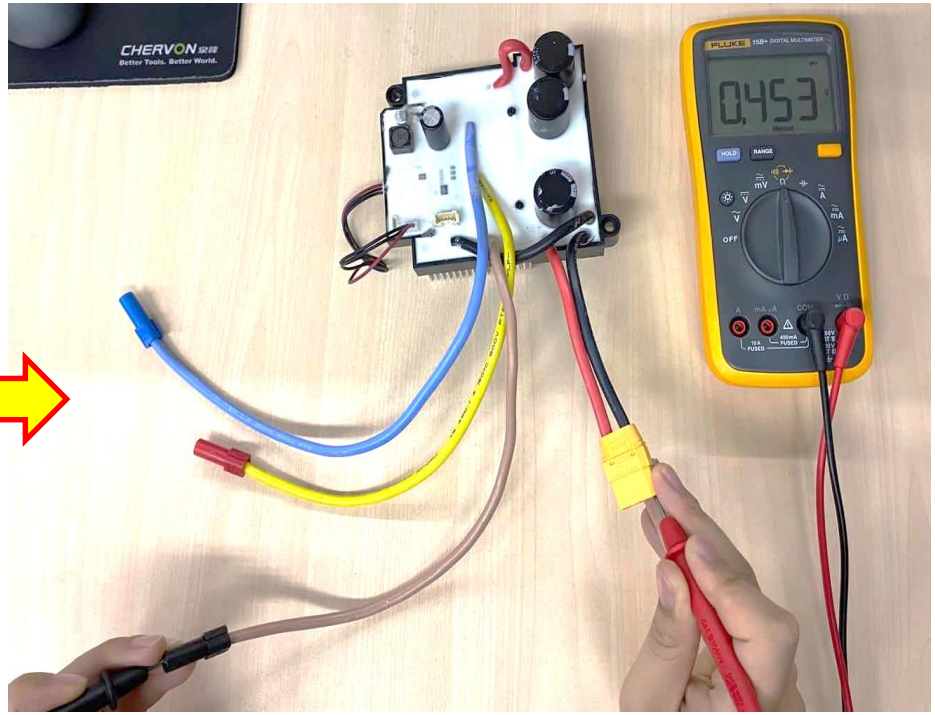
b) Contact the black pen pin to the positive contact(red) of the yellow connector (connect to the wiring harness) and the red pen pin to the contacts of the three connectors (connect to the motor) one by one;

c) Exchange the pen pins, contacting the red pen pin to the negative contact(black), repeating the same above step.

d) If the LCD displays 0.40~0.55V (see next slide), means a good PCBA, otherwise means the PCBA is broken.

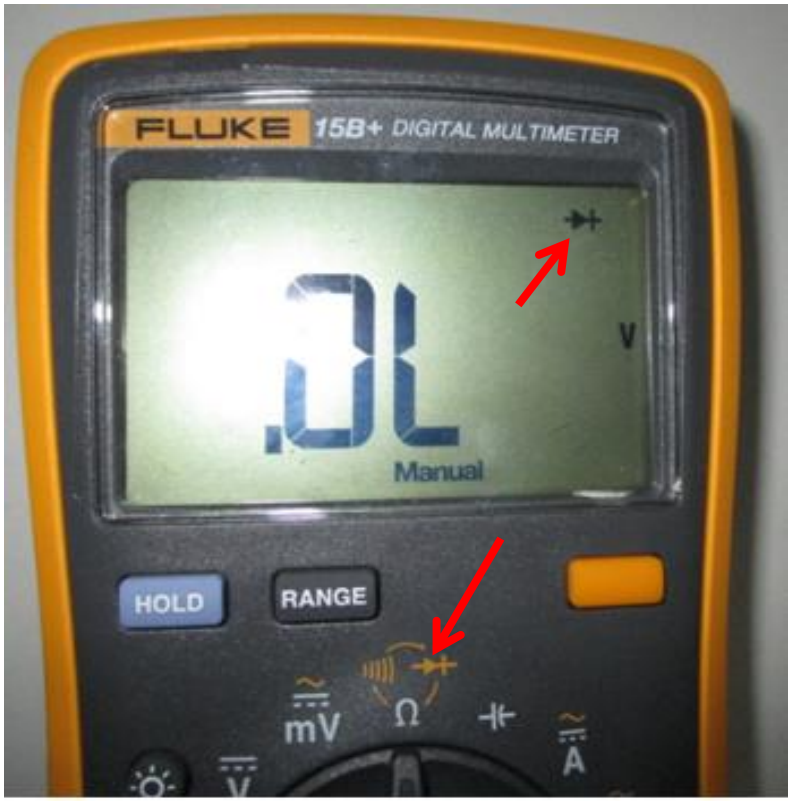
# How to diagnose the main PCBA



# How to diagnose the self-propelled PCBA

1. Measure the self-propelled PCBA .



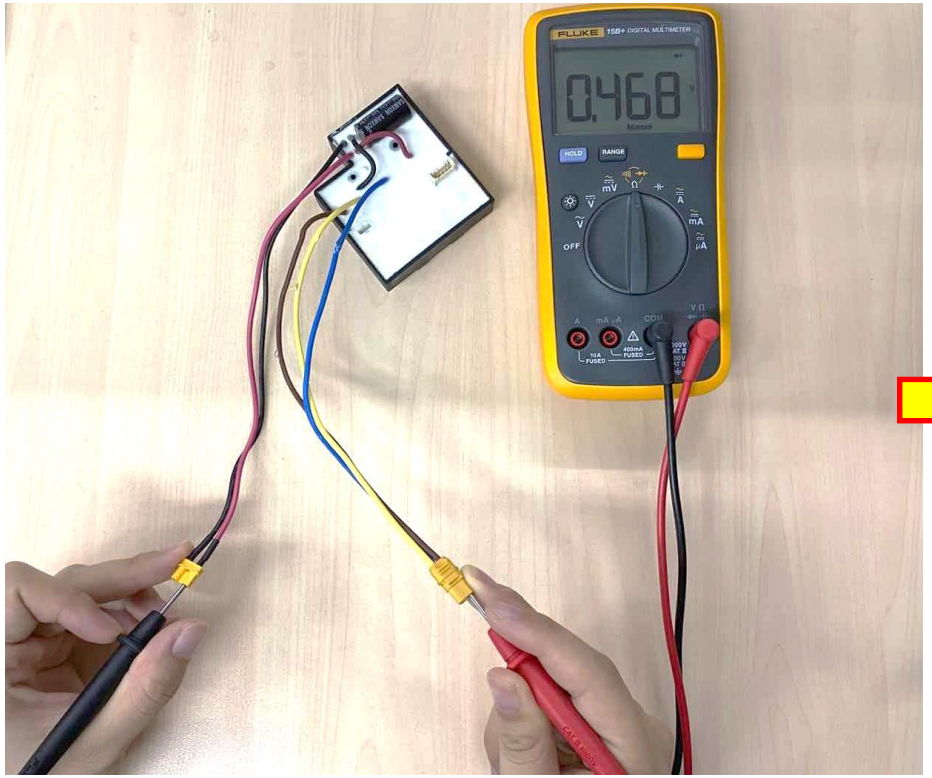

a) Set the Multimeter function to “Diode measuring” .

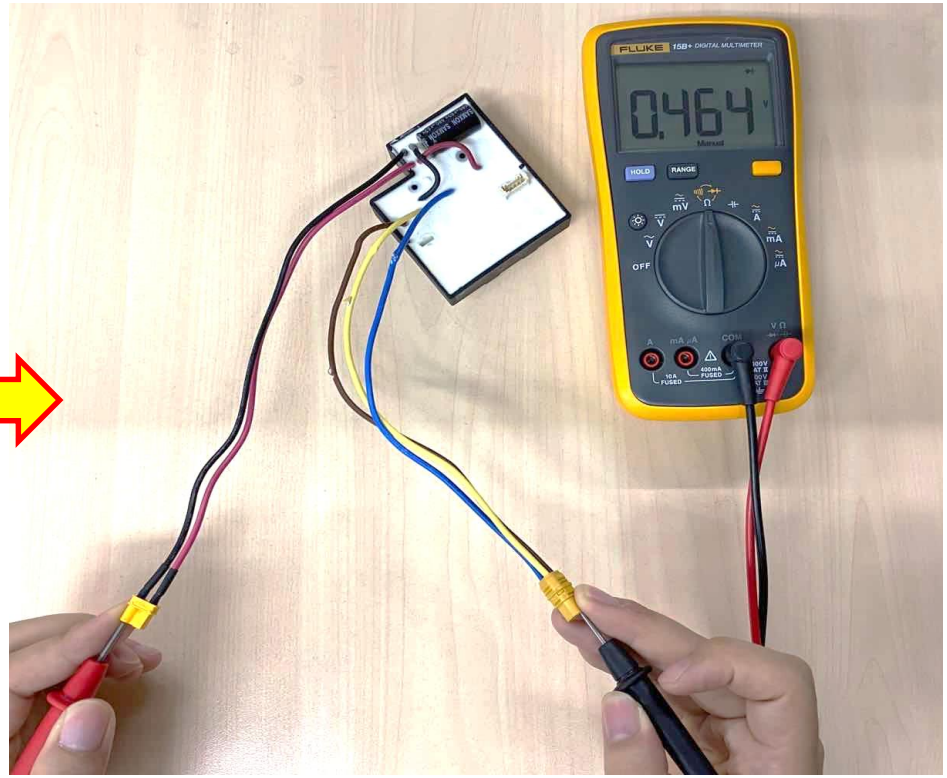
b) Contact the black pen pin to the positive contact (red) with the yellow connector (connect to the wiring harness) and the red pen pin to the three contacts of the triangle yellow plug (connect to the self-propelled motor) one by one;

c) Exchange the pen pins, contacting the red pen pin to the negative contact(black), repeating the same above step.

d) If the LCD displays 0.40~0.55V (see next slide), means a good PCBA, otherwise means the PCBA is broken.

# How to diagnose the self-propelled PCBA

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