

How to stop the nasty sparks when connecting your battery leads and ESC

For those who are alarmed by that nasty little spark you see when connecting a battery pack to the ESC, here a solution.

When connecting a battery pack to the controller, strong sparking commonly occurs. Fast-charging the controller filter capacitors cause this. The higher the voltage (the higher the cell count), the lower the internal resistance (and the better the quality of the pack), the better the capacitors in the ESC, the bigger the spark that occurs.

Besides the small shock (because of the spark), the capacitors' charging current may be, in extreme cases, so big that damage or destruction of the capacitors occurs. A simple procedure exists to eliminate sparking when connecting the battery pack.

This inexpensive modification eliminates sparking, and thus protects the filter capacitors without sparking.

1. Connect the negative leg of the battery to the negative wire on the controller.
2. In the positive circuit, connect the positive leg of the controller to the auxiliary connector (to which a resistor with 10 s of ohms is connected in serial). This will limit the charging current when connecting the wires and will charge the filter capacitors without the sparks.
3. Connect the power wires – sparking will not occur.
4. Start the motor.

There are no special requirements on the auxiliary connector. The current is small (1-2 amps) and lasts only for a short time. Nor are there requirements on the resistor; any type is sufficient, such as metalized 0.6 watt, size 0207, and value of 20 to 50 ohms, depending on the battery pack's voltage.

On a four- to six-cell Li-Poly pack, use 20 ohms; for 10-cell Li-Poly, use 33 ohms; for 12-cell and up, use 51 ohms. It is unnecessary to use these exact values because of wide variation.

Connect the new auxiliary connector.

Capacitors are charged with small current; sparking will not occur.

Connect the power connectors (sparking will not occur).

Leave the auxiliary leads connected. The main current to the controller and motor during operation passes through these power connectors and conductors.

See the wiring illustration for further clarification.

