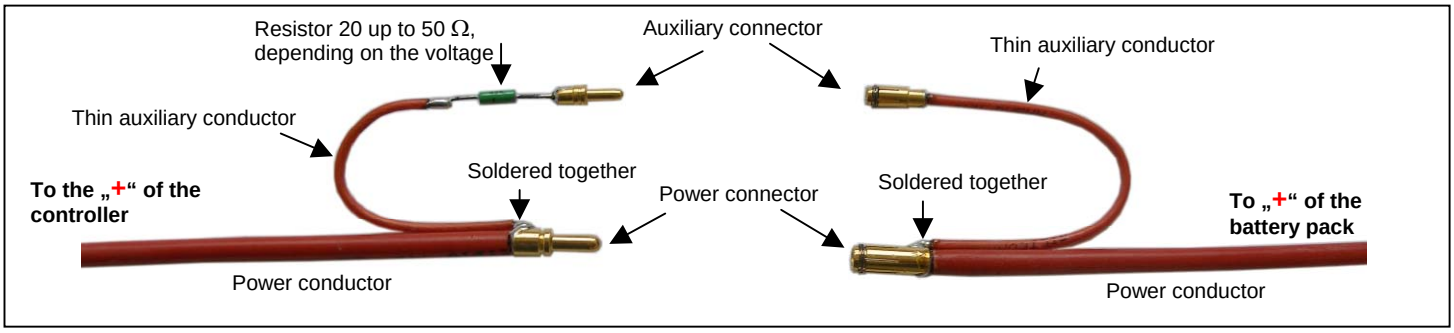
How to prevent sparking

When connecting a Li-xxx pack to the controller, strong sparking commonly occurs. Fast charging of the controller filter capacitors causes 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 controller and the higher the capacity of the capacitors, the bigger spark occurs. Besides the small shock (due to the sparking), the charging current of the capacitors may be in, extreme cases, so great 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.

How to connect the positive leg or wire (shown here without insulation):



Connectors as well as the resistor are insulated by heat shrink tubing.

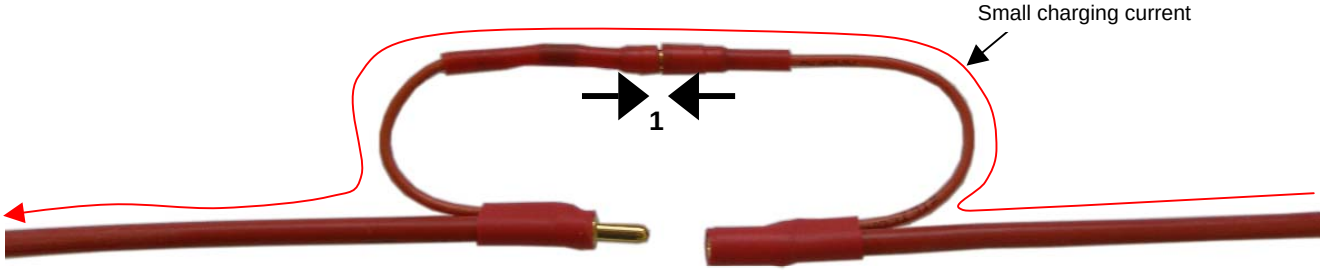
How to connect the battery:

1) connect the “– “ leg of the battery to the “– “ on the controller.
2) in the positive circuit, first connect the “+” leg of the controller to the auxiliary connector (to which a resistor with tens of ohms is connected in serial). This will limit the charging current when connecting the wires and will charge the filter capacitors without sparking.
3) now connect the power wires (sparking will not occur). You may start the motor now.

There are no special requirements on the auxiliary connector. The current is small (1- 2A) and lasts only for a short time. There are also no requirements on the resistor, any type is sufficient, e.g. metallized 0.6W, size 0207, value between 20 to 50Ω depending on the voltage of the battery pack. E.g. for 4 – 6 Lipol use 20Ω, for 10 Lipol 33Ω, for 12 up to 15 Lipol 51Ω. However, it is not necessary to use these exact values because of wide variatio n.

How to connect the positive leg

Connect the new auxiliary connector first. Capacitors are charged with small current. Sparking will not occur.



Now connect the power connectors (sparking will not occur). Main current to the controller and the motor during operation passes through these power connectors and conductors.