

Electric Drive

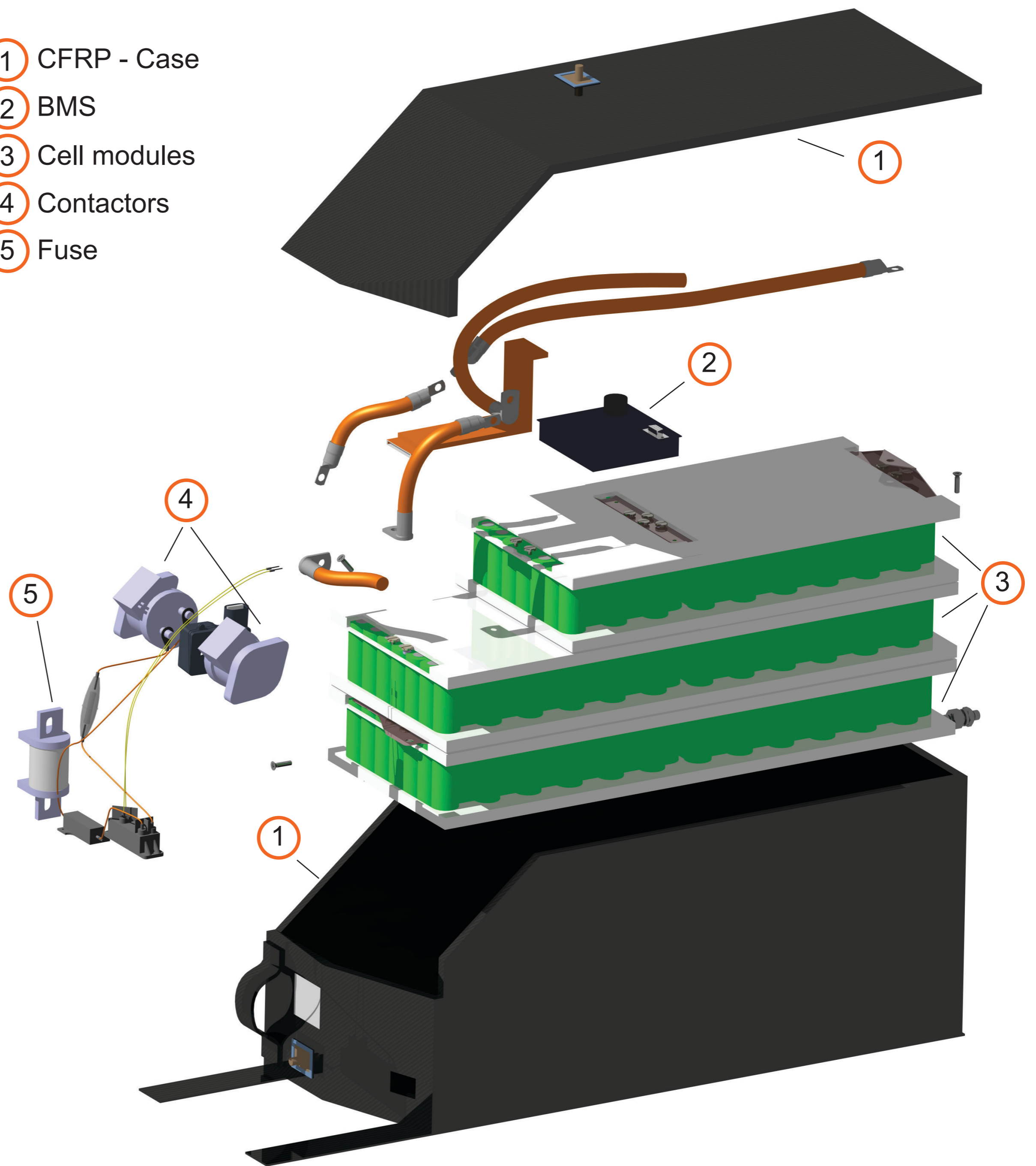
Accumulator

For our racecar in the season 2010 / 2011 we are using a self-designed high-voltage accumulator. It is split into two cases which are connected in series. This option guarantees a quick removal and easy maintenance.

Both cases are made from Carbon Fibre Reinforced Plastic (CFRP). For minimizing the fire hazard we added fire-retardant additives to both cases. Each case is monitored separately by a Battery Management System (BMS). They are constantly measuring all voltages and selected temperatures at important spots. This setup guarantees, that the accumulator cells are in no critical state at all time.

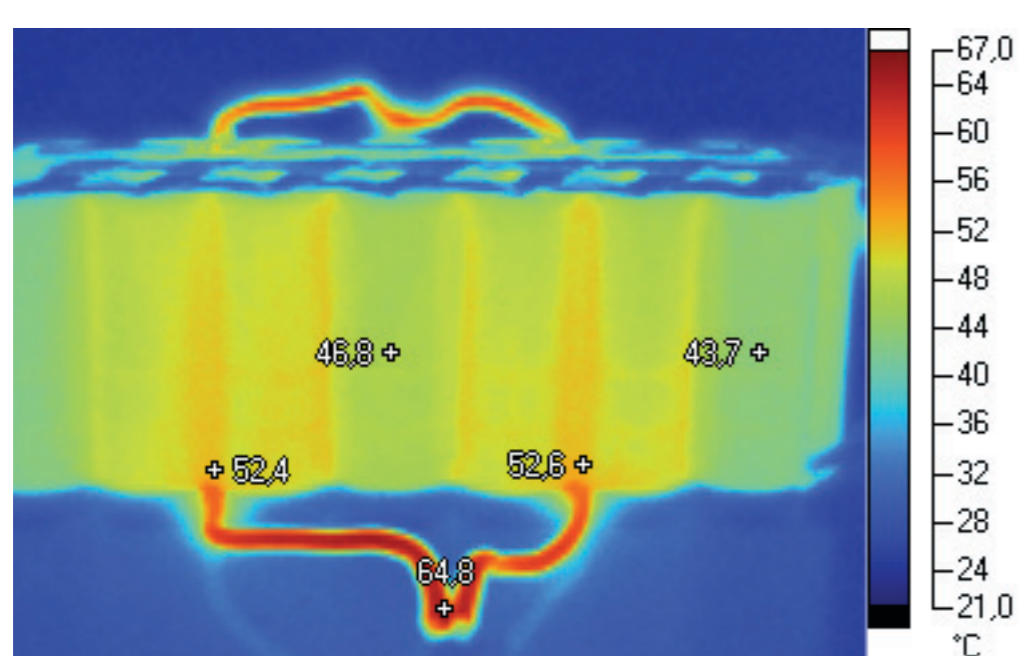
In addition to that, each of the four battery terminals of both accumulator cases is protected by a contactor and a 300A fuse, preventing short-circuits.

- ① CFRP - Case
- ② BMS
- ③ Cell modules
- ④ Contactors
- ⑤ Fuse

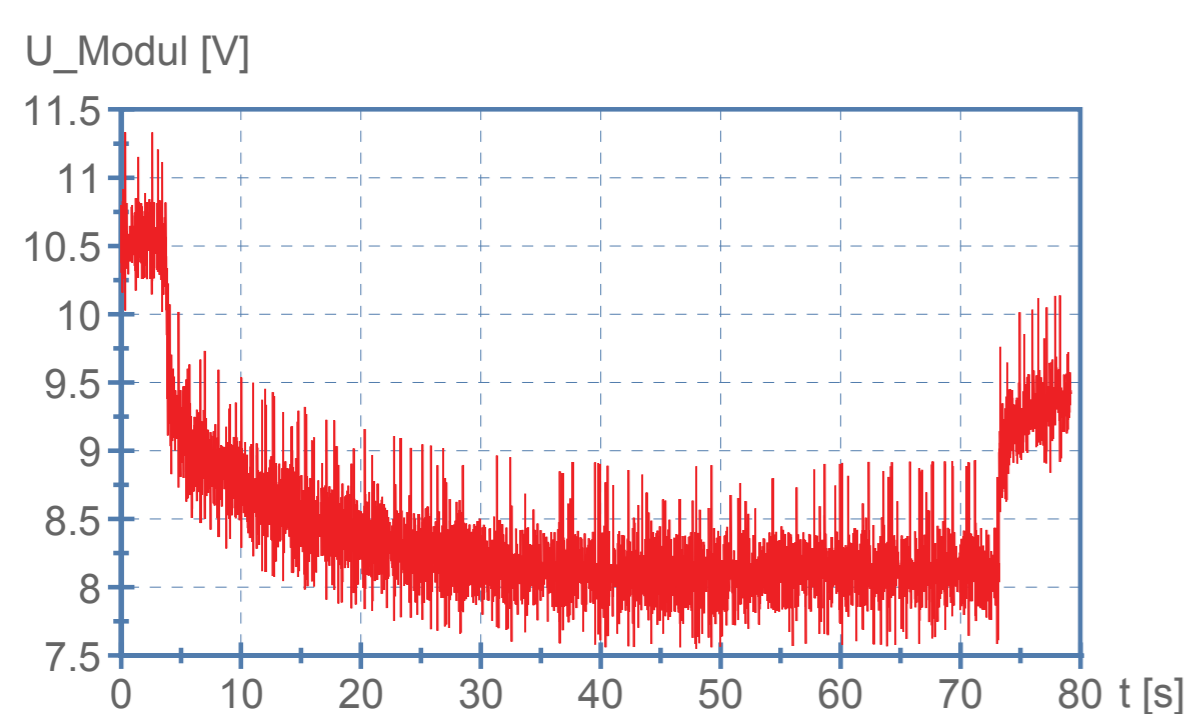


Accumulator Exploded View

Accumulator Data	
Voltage	435 V
Capacity	7 kWh
Number of Cells	924
Cell Interconnection	132s7p
BMS Communication	CAN



Thermographic picture of a cell test with 250 A



Voltage drop at 250 A Test

Cells

Our accumulator cells are LiFePO₄ from A123 Systems, which excel by their durability and their safety.



LiFePO₄ Cell A123 Systems

Testing our Cells

We made a test pack with 7 cells connected in parallel and 3 in series (3s7p) and tested them at a battery test rig of our university. The cells were stressed with different amperages, in order to find out if the voltage drop is within the expected tolerances for our cell connection method.

Cell Data	
Voltage	3,3 V
Capacity	2,3 Ah
Mass	70 g
Max. Continuous Current	70 A
Pulse current (10 s)	120 A
Operating Range	-30 °C to 60 °C