Selecting the correct fuse is very important. Most people understand the first selection criterium.

First selection criterium is the fuse cut-off amperage. This should be chosen according the total resistance in your circuit. The fuse cut-off amperage needs to be exceeded at short circuit situation in order to trigger the fuse to blow. In simple words: You need the current to be high enough to enable the fuse to end the current flow.

The resistance in your circuit is mainly depending on the dimension of your cable en the length of your cable. I must note that poor cable lug connection or resistance in a main switch will also be a factor. You could find undesired resistance while running nominal current scanning with a thermal camera or if voltage is safe feeling with your hand to find any heat source.

Assuming you do not have poor connections or a poor main switch you can use the following rule off thumb. For short DC power cables you can choose a fuse dimension of three times the cable size. For example, if you use 90mm2 DC cable you could use 270 Ampere main fuse. As 270 Ampere does not exist you should select 250 Ampere.

The second selection criterium us the fuse interrupt rating.

This is the capability to interrupt the current flow. In simple words the fuse must be able to stop the current.

A lithium battery has very low internal resistance. It is a fairly ideal power source. We like this because they have low losses and low heat production. At the down side the lithium battery will push out many amps in short circuit situation. Your fuse must be able to cope with this violent Amp push. The fuse needs to end it.

I have tested the short circuit capability of the Tesla modules. The 444 cell module 5.3 kWh was able to produce 3000 Amps (internal resistance app 0,008 Ohm). The 516 cell module 6.2 kWh was able to produce 3500 Amps (internal resistance app 0,0068 Ohm).

Catalog symbol:

- ANL-(amp)

Description:

Non-time-delay low voltage limiter for use in isolating faults in battery operated systems.

Specifications:

Ratings

- Volts 80Vdc or less
- Amps 35-750A
- IR 2700A

If you have two Tesla modules parallel (444 cell type), they will produce 6000 Amps. So more parallel strings gives higher short circuit push.

If you would select this fuse you would have made the wrong choice. You see the IR 2700 A. IR is Interrupt rating. This fuse is designed to stop current flow from a power source with maximum 2700 Amps current push. So it will not be able to stop the 6000 Amps from two Tesla 444 cell modules in parallel. Probably the DC current will find it's way through the air keeping the current flow alive until the problem has escalated to the next week link. Or the battery heats up and catches fire.

The correct fuse to do this job is:

- **Current Rating 110 to 400 Amps**
- **For use with FB & CFB holders**
- **Extremely Current-limiting**
- **Common Applications:**
  Solar Generators, Wind Power, Heavy Industry, Variable Speed Drives, Battery Chargers, Mining

SPECIFICATIONS	
Voltage Rating	AC 300 V / DC 125 V
Ampere Range	110 - 400 A
Interupting Ratings	AC: 200kA RMS symmetrical DC: 20kA
Material	Melamine Body / Copper Caps

You have to respect the DC Voltage rating of max 125V. And this fuse will end up to 20.000 Amp.

So you could have 6 parallel strings of Tesla 444 cell modules (6x3000=18.000 Amp).

Another advantage of this high quality fuse is it’s low internal resistance. It will dissipate less heat.

Make sure you install the fuse nearest to the battery as possible.