

Series & Parallel Connections of 12v Lithium Batteries

Connecting in Parallel:

The reason why you sometimes cannot connect “Drop in Replacement” 12v Lithium batteries in parallel, is because of balancing issues. When you make a parallel connection with a standard 12v BMS (like we have in our LFP range), you have to make sure the battery packs are at the same State of Charge (SOC), otherwise the loop current (around 1000A) may destroy the BMS and the cells.

There are special BMS' on the market, with active balancing, that cater for packs that are at the different SOC levels. In these instances, the pack with the higher voltage will charge the lower pack, and in so doing, this BMS will limit the loop current.

For 12V “drop-in replacement” batteries, price is always a driving factor, so we tend to use the standard (cheaper) BMS which does not have Active Balancing. If a customer still insists on connecting these 12v packs in parallel, it is strongly suggested that the packs be fully charged before making the parallel connection. This is not a “fail safe” but will certainly help with the balancing issue.

Connecting in Series:

Again, the BMS used in the 12v packs, determines if the pack can be connected in series or not. If the components used on the BMS supports 100V volts, then you can connect the packs in series. If not, then it is prohibited to do so due to safety reasons.

Once again, in order to keep the cost of these “drop-in replacement” batteries' down, it is normal to find that a standard BMS is used, which does not allow for the higher voltage. Again, there are some BMS' on the market that can handle the higher voltage and in these instances, they allow for parallel connections of up to 4pcs at a time.

Model	Description	Series Connection		Parallel Connection	
		Y/N	Max Qty	Y/N	Max Qty
20706	12v 7Ah Lithium	Yes	2	No	N/A
21563	12v 7Ah Gate Motor	Yes	2	No	N/A
21308	12v 20Ah Lithium Battery	Yes	4	No	N/A
21307	12v 50Ah Lithium Battery	Yes	4	No	N/A
21306	12v 100Ah Lithium Battery	Yes	4	No	N/A
21301	12v 120Ah Lithium Battery	Yes	4	No	N/A
22511	24v 50Ah Lithium Battery	Yes	4	No	N/A