

ContainerPower Energy Solutions

Lithium battery packs in series and parallel



Overview

Connecting battery packs in series increases the output voltage while keeping the capacity the same. In contrast, wiring them in parallel boosts the total capacity without changing the voltage. Are series and parallel connection of lithium batteries safe?

The series and parallel connection of lithium batteries is a key technology to increase voltage and capacity, but it also contains safety risks. This article will analyze in detail the principles, methods and precautions of series and parallel connection of lithium batteries to help you avoid potential risks and build a battery system correctly.

How to charge parallel lithium battery packs?

Specific principles must be followed when charging parallel lithium battery packs: Use a matching charger: The voltage must be suitable for the nominal voltage of the individual batteries. The current setting is reasonable: usually 0.2-0.5C of the total capacity after parallel connection.

Should lithium batteries be connected in parallel?

Connecting lithium batteries in parallel increases the battery bank capacity and the total stored energy. No matter the BMS design, because both solid-state-relays and mechanical relays have current limits, the BMS maximum current limits must be respected when designing a parallel connected bank of lithium batteries with built in BMS.

How many cells are in a lithium-ion battery pack?

The method undergoes a real-world electric vehicle testing with 276 cells. The limited charging performance of lithium-ion battery (LIB) packs has hindered the widespread adoption of electric vehicles (EVs), due to the complex arrangement of numerous cells in parallel or series within the packs.

Why are lithium batteries connected in series?

Lithium batteries are connected in series when the goal is to increase the nominal voltage rating of one individual lithium battery - by connecting it in series strings with at least one more of the same type and specification - to meet the nominal operating voltage of the system the batteries are being installed to support.

What is a battery pack configuration?

Battery pack configurations determine how much power a battery can provide and for how long. Whether you're choosing a battery pack for an electric vehicle, a robotics project, or an energy storage system, understanding the difference between series and parallel connections can help you make the best decision.

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