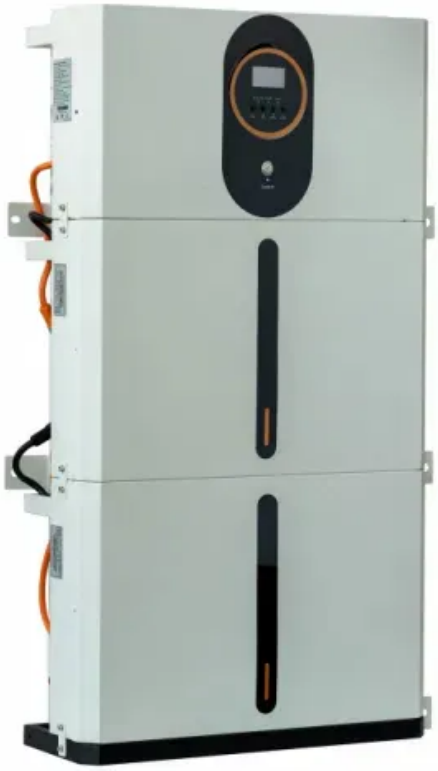
SolarInnovate Energy Solutions

Lithium battery pack virtual connection



Overview

What is a virtual battery?

The virtual battery is a power source that can simulate the charging and discharging characteristics of a battery pack under different operating conditions. Hence, the key step for a virtual battery pack to be able to replace the actual battery pack for the testing of a BMS is to establish an accurate model.

Does a series-connected lithium-ion battery pack have a fault?

In this study, small-scale fault experiments that consider the inconsistency among cells, virtual connection fault, and external short circuits of the series-connected lithium-ion battery pack are carried out under laboratory conditions to verify the proposed method.

Can a virtual battery pack replace the actual battery pack?

Hence, the key step for a virtual battery pack to be able to replace the actual battery pack for the testing of a BMS is to establish an accurate model. The current battery model mainly includes an electrochemical, black box, and the equivalent circuit models. The equivalent circuit model is commonly used for battery pack modeling.

Why should you use a virtual battery pack?

Since the virtual battery pack can be quickly switched between different SOC states, temperatures, and aging states via the host computer, it can save a lot of time when using the virtual battery pack to conveniently evaluate the BMSs functions compared with that when using the actual one. Figure 6.

What is a series-connected virtual battery pack model?

A series-connected virtual battery pack model through leveraging Copula’s method is formulated to capture the dynamics and inconsistency of individual batteries in the pack.

Can a lithium iron phosphate model reproduce a real battery pack?

The developed lithium iron phosphate model features low computational efforts and is experimentally validated with different dynamical profiles, implying a high-precision virtual battery pack that is capable of reproducing the actual one.

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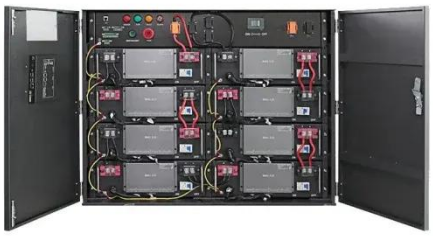
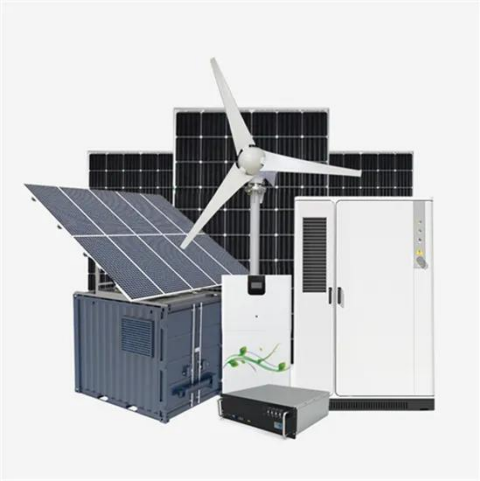


Thermal Simulation of Li-Ion Battery Pack Using ANSYS Fluent

Mar 1, 2021 · 4.1 Simulation Setup The geometrical shape of the lithium-ion battery is cylindrical. The software that we have used for this simulation is Ansys Fluent (Available in Ansys ...

Simulation and comparative study of the effect of the ...

Nov 20, 2023 · Abstract Accurately simulating and characterizing the thermal behavior of lithium batteries is vital for thermal design and management. Currently, the widely used simulation ...



Fault detection of the connection of lithium-ion power ...

Oct 20, 2015 · This paper proposes a method of fault detection of the connection of Lithium-Ion batteries based on entropy for electric vehicle. In electric vehicle operation process, some ...

Thermal Simulation of Li-Ion Battery Pack Using ANSYS ...

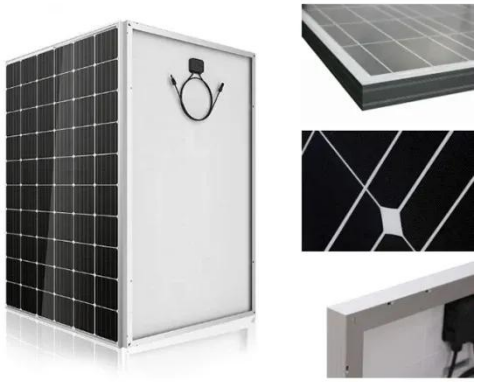
Mar 1, 2021 · Here p stands for parallel and s stands for series so 1p2s means one parallel two series connection so the number of a lithium-ion battery cell, in this case, will be two. 1p5s ...

Fault detection of the connection of lithium-ion power ...

Dec 1, 2018 · Inter-cell virtual connection is likely to occur in the process of electric vehicles driving, which could cause fire or explosion accident. This paper presents a connecting fault ...

Virtual Battery Pack-Based Battery Management System ...

Jan 6, 2023 · The developed lithium iron phosphate model features low computational efforts and is experimentally validated with different dynamical profiles, implying a high-precision virtual ...



A novel measurement

technique for parallel-connected lithium ...

Aug 15, 2021 · This work investigates a novel measurement method to connect cells in parallel with controllable interconnection resistances. Instead of a physical connection, the presented ...

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