SolarInnovate Energy Solutions

Internal circulation heat dissipation of liquid flow batteries in communication base stations

Overview

How to improve heat dissipation efficiency of battery liquid cooling thermal system?

To improve the heat dissipation efficiency of the battery liquid cooling thermal system (BLCS), numerous scholars have conducted a lot of research on the coolant runner structure of the liquid-cooled plate. The related studies can be categorized into two types, i.e., conventional runner structure and bionic runner structure.

What is the temperature difference between a battery pack & flow rate?

0.03 to 0.07 m/s, the temperature rise of the battery drops by about 0.6 °C, and the temperature difference is basically close. 2. Analysis on the simulation results of the battery pack at different flow rates at.

Why do we need a thermal management system with high heat dissipation capacity?

Therefore, a thermal management system with higher heat dissipation capacity is needed for battery packs that need to be charged and discharged at a high rate. Under the current simulation conditions, the flow rate of the coolant has little influence on the heat dissipation of the battery system.

How does a flat heat pipe affect a battery discharge rate?

The increase in the width of the flat heat pipe reduces the low-temperature strips at the bottom of the battery, making the distribution of the low-temperature area more uniform. It can be concluded that: The maximum temperature difference can be controlled below 5°C at 3 C discharge rate with 11 128 mm flat heat pipes.

What happens when a battery monomer reaches a uniform downward heat transfer?

This indicates that after the maximum surface of the flat heat pipe is fully

contacted with the battery monomer, the heat dissipation of the battery monomer in the liquid cooling plate with a width smaller than its own reaches a state of uniform downward heat transfer.

What is BTMS heat dissipation?

For a long time, many scholars have been devoted to the research of the most advanced battery thermal management system (BTMS), and the current main heat dissipation methods include air cooling, liquid cooling, heat pipe cooling and phase change material cooling .

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Advanced cooling channel structures for enhanced heat dissipation ...

Jul 1, 2024 · Thermal protection is crucial for active cooling runner structures. It's highly effective for achieving thermal insulation in aerospace applications. This study focuses on evaluating ...

Study on the thermal interaction and heat dissipation of ...

Dec 1, 2017 · Existing heat generation models in Lithium-Ion battery is defined as the thermal boundary conditions. The flow and convection on the spacing has been studied. The transient ...

Thermal characteristics and reliability analysis of liquid-cooled heat

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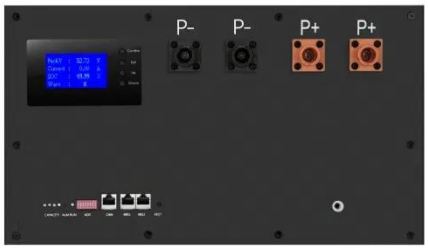
Heat dissipation optimization for a serpentine liquid cooling battery

Aug 1, 2021 · The battery thermal management system (BTMS) can maintain the batteries within a safe temperature range. This paper studied a liquid cooling BTMS incorporating serpentine ...



Investigation on enhancing thermal performance of the Li-ion battery

Jan 15, 2025 · Efficient thermal management is crucial for the safety and high-performance of battery packs in electric vehicles (EVs). A battery thermal management system (BTMS) with ...

Modeling and Optimization of Liquid Cooling Heat ...

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Thermal characteristics and reliability analysis of liquid-

cooled heat

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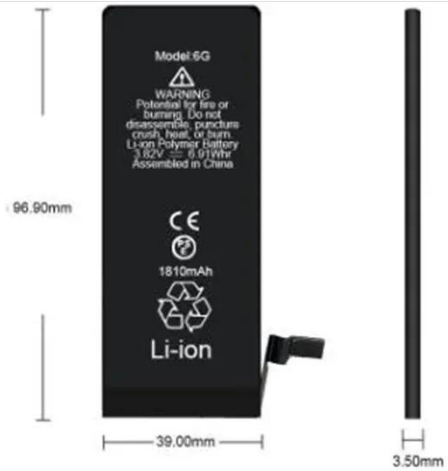
Environmental feasibility of secondary use of electric vehicle ...

May 1, 2020 · The choice of allocation methods has significant influence on the results. Repurposing spent batteries in communication base stations (CBSs) is a promising option to ...



Adaptive battery thermal management systems in unsteady ...

Oct 1, 2024 · Since the heat generation in the battery is determined by the real-time operating conditions, the battery temperature is essentially controlled by the real-time heat dissipation ...

Four Heat Dissipation Methods for Electronic Devices

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Heat Dissipation Improvement of Lithium Battery Pack with Liquid

May 12, 2022 · The battery temperature rise rate is significantly increased when a lithium battery pack is discharged at a high discharge rate or charged under high-temperature conditions. An ...

Research on the heat dissipation performances of lithium-ion battery

Nov 8, 2024 · This paper delves into the heat dissipation characteristics of lithium-ion battery packs under various parameters of liquid cooling systems, employing a synergistic analysis ...

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