New Energy Battery Intelligent Temperature Control System

Can self-adapting air-based J-type battery thermal management system control temperature rise?
Overall,the developed self- adapting intelligent J-type BTMS via ANN-based MPC is capable of controlling the temperature riseas well as the temperature uniformity in a reasonable range. This paper developed a self-adapting air-based J-type battery thermal management system.

Is BTMS a self-adaptive control strategy for electric vehicles?
This paper develops a self-adaptive control strategy for a newly-proposed J-type air-based battery thermal management system(BTMS) for electric vehicles (EVs).

Can a self-adapting J-type battery thermal system be used with other equipments?
Potential future workwill in- tegrate the self-adapting J-type battery thermal system to- gether with the operations of other equipments like air con- ditioner for an optimal battery discharging scheduling.

Who provided data on battery electro-thermal modeling?
The authors would like to thank Prof. Babak Fahimi and Dr. Zhuo Yang,at the Department of Electrical and Computer Engineering,The University of Texas at Dallas,for providing data on battery electro-thermal modeling. Pesaran,A.,Santhanagopalan,S.,and Kim,G.,2013.

Does the optimized J-type BTMS improve temperature uniformity?
Results showed that the optimized J- type BTMS has a 35.3% reduction in temperature rise,and a 63.4%improvement in temperature uniformity,with a cost of 7.5% augment in pressure drop compared to the bench- mark case. Based on the optimized J-type BTMS,an ANN-based MPC model was developed and tested with the UDDS driv- ing cycle.

This innovative technology represents a forward-thinking approach to enhance the efficiency, safety, and overall performance of batteries, with a particular emphasis on Electric Vehicle ...

One or more embodiments of the present disclosure provide an intelligent temperature control and heat dissipation device for a new energy battery, which combines air cooling, liquid cooling, ...

Authors in [5] have described a novel method of hybrid PV/battery energy systems in a DC-coupled structure that can be adopted to solve the problem and replace fuel Cells. In [21] a hybrid PV/wave standalone hybrid PV/ wave energy conversion system with battery energy storage has been discussed. In this system, the bidirectional buck-boost DC ...

New energy power battery charging and discharging system platform. ... external circuit of the intelligent temperature control system is simple, which has the functions of good accuracy, high ...

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The effectiveness of battery temperature control and the influence of the drive cycle on system performance have been examined: A fixed EEV control strategy, potential battery pack size mismatch, limited real-world drive cycle representation, and lack of comprehensive performance metrics: 9: Mohammadin & Zhang, 2015 [36] Prismatic LIB: 27: 1 ...

Enhancing the performance of electric vehicles (EVs) necessitates a strategic approach to managing the power battery system, with a pivotal focus on the Battery Thermal ...

Effective thermal management of batteries is crucial for maintaining the performance, lifespan, and safety of lithium-ion batteries [7].The optimal operating temperature range for LIB typically lies between 15 °C and 40 °C [8]; temperatures outside this range can adversely affect battery performance.When this temperature range is exceeded, batteries may experience capacity ...

This thesis studies the development of the energy management system and control strategy of intelligent connected new energy vehicles and discusses the core techniques ... Among the influencing factors of the total capacity of the battery, the ambient temperature, the number of battery cycles, and the average discharge current are the key ...

The control of the integrated thermal management system of battery electrical vehicles mainly includes the thermal comfort control of the passenger compartment, the ...

Technical difficulties: New technologies need to be studied for cascade utilization, such as AI algorithm optimization of battery design and control scheme, intelligent charging and discharging technology, and lithium salt solution regeneration, pyrolysis and other technologies can also be used to improve the recycling efficiency of battery materials, which ...

The Battery Energy Management is a system which manages the electrical energy in a car by using a hardware control unit combined with three software modules: battery diagnosis, stop-mode ...

In addition, the experimental trial revealed that the surface temperature of the battery decreased by approximately 43 °C (from 55 °C to 12 °C) when a single cell with a copper holder was subjected to a TEC-based water-cooling system, with a heater provided with 40 V and the TEC module supplied with 12 V. Esfahanian et al. [87] implemented an air flow system ...

The invention relates to the technical field of battery temperature control, in particular to an intelligent control system for the temperature of a power battery of a new...

For instance, artificial neural networks (ANNs) have been utilized to model and control battery temperature in electric vehicles. Zhang et al. (2018) proposed an ANN-based temperature control system that utilized

real-time data to predict battery temperature and ...

Those strict regulations combined with ecological consequences of massive GHG emissions have prompted technical experts to explore energy-saving and emission-reduction technologies in ships, including novel hull and superstructure design, new propulsion systems, advanced energy management and operational optimization [12, 13] yond these ...

The control effect of the fuzzy-PID dual-layer coordinated controller is numerically evaluated, and the results show that it can maintain the average temperature of the Li-ion battery pack in the ...

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