

Can ultra-thin heat pipes reduce the operation temperature of a charging pile?

In order to reduce the operation temperature of the charging pile, this paper proposed a fin and ultra-thin heat pipes (UTHPs) hybrid heat dissipation system for the direct-current (DC) charging pile. The L-shaped ultra-thin flattened heat pipe with ultra-high thermal conductivity was adopted to reduce the spreading thermal resistance.

How does a shell-and-tube thermal energy storage unit work?

Author to whom correspondence should be addressed. Shell-and-tube latent heat thermal energy storage units employ phase change materials to store and release heat at a nearly constant temperature, deliver high effectiveness of heat transfer, as well as high charging/discharging power.

What is energy storage charging pile management system?

Based on the Internet of Things technology, the energy storage charging pile management system is designed as a three-layer structure, and its system architecture is shown in Figure 9. The perception layer is energy storage charging pile equipment.

How does the energy storage charging pile interact with the battery management system?

On the one hand, the energy storage charging pile interacts with the battery management system through the CAN bus to manage the whole process of charging.

What is the energy storage charging pile system for EV?

The new energy storage charging pile system for EV is mainly composed of two parts: a power regulation system and a charge and discharge control system. The power regulation system is the energy transmission link between the power grid, the energy storage battery pack, and the battery pack of the EV.

Can UTHPs be used to heat dissipate DC EV charging piles?

The UTHP was especially suitable for the heat dissipation of electronic equipment in narrow space. Thus it could be directly attached to the surface of the electronic components to cool the heat source. However, few researches reported on the application of UTHPs to the heat dissipation of the DC EV charging piles. Fig. 1.

Phase change material (PCM) stands out as a highly efficient TES system. Enhancing heat transfer during phase change is a major challenge in creating effective PCM ...

Therefore, a two-dimensional numerical model of the charging process on the heat storage unit of the shell-and-tube latent heat TES system is constructed. The VOF model and Lee model are combined to simulate the phase change of ...

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Despite PHES, with relatively long life span besides exceptionally large capacity and low self-discharge rate [4], accounting for more than 95 % of the world's total installed ...

The thermal management impact is directly affected by the PCM's reduction in heat storage capacity as the graphite concentration increases. Therefore, for efficient heat ...

Fig. 12 (a) shows that the energy storage rate is considerably high at the beginning of the charging process because of the initially high temperature difference between ...

storage pile. ..., 2014, 42(12):104-108. KONG G Q. Comparative analysis on heat exchange tube in energy pile with various embedded (in ... Charging pile energy storage system can improve ...

The energy storage efficiency of BTES first increases and then decreases with the increase of aspect ratio. This is because when the aspect ratio is $\ll 1$ and $\gg 1$, the area-to ...

In this paper, the battery energy storage technology is applied to the traditional EV (electric vehicle) charging piles to build a new EV charging pile with integrated charging, discharging, and storage; Multisim software is used ...

Further optimization of the T-shaped fins by flattening the design increased the heat storage rate and reduced charging time. ... of fins and nanomaterials in conjunction with gravity to achieve ...

The fast charging of thermal energy storage (TES) systems is a requirement for the practical application of these systems. The thermal energy should be stored in a unit within ...

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