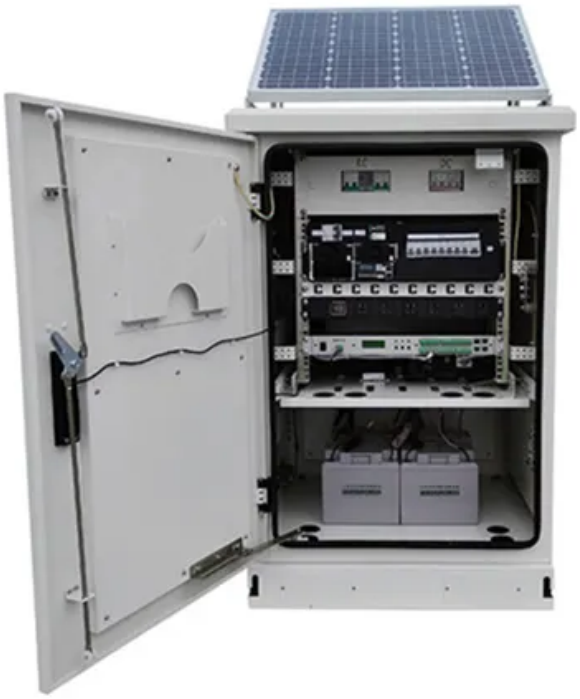
SolarInnovate Energy Solutions

Water cooling of communication base station energy management system



Overview

Are data centres and telecommunication base stations energy-saving?

Data centres (DCs) and telecommunication base stations (TBSs) are energy intensive with ~40% of the energy consumption for cooling. Here, we provide a comprehensive review on recent research on energy-saving technologies for cooling DCs and TBSs, covering free-cooling, liquid-cooling, two-phase cooling and thermal energy storage based cooling.

Can energy-saving cooling technologies be applied to DCS & TBSS?

Energy-saving cooling technologies, as environmentally friendly and low-cost cooling solution, have been developed low-carbon, energy-efficient and achieving sustainability (Cho et al., 2017). Such cooling technologies could be applied to DCs and TBSs since their servers and racks have similar layouts.

What are the different phase change cooling technologies in data centres?

Yuan et al. reviewed the technical principles, advantages, and limitations of four major phase change cooling technologies in data centres, namely, stand-alone heat pipe cooling, integrated heat pipe cooling, two-phase immersion cooling and phase change cold energy storage.

What is TES based cooling?

The TES-based cooling can be used in combination with other cooling technologies and has the advantage of reducing the energy consumption of CRACs as well as making full use of natural cool sources through peak shaving. PUE values of DCs and TBSs using these two cooling technologies have the potential for further reduction.

Do natural cooling sources increase the coefficient of performance of TBS?

They also showed an increase of the annual coefficient of performance (COP) of the TBSs by 23.7% with the ESR reaching 19.2% with the full utilization of natural cooling sources (Dong et al., 2017). Fig. 8. Schematic diagram of a

water-side indirect free cooling system in the bypass of the chiller (Nadjahi et al., 2018). 3.2. Liquid cooling.

What is a TBS cooling system?

TBSs are communication equipment centres that send, receive and exchange signals in an information transmission network. They have a higher internal heat density than most of general computer rooms and therefore generally need a cooling system with a higher cooling intensity.

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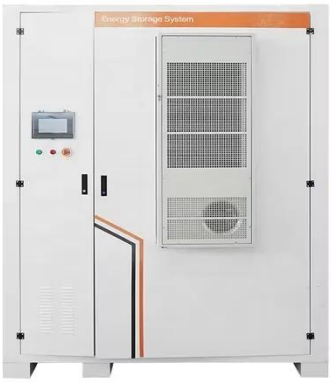
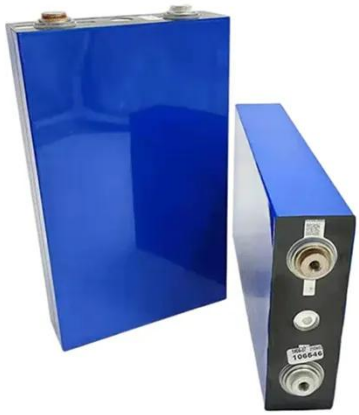


Performance optimization of server water cooling system ...

Dec 1, 2021 · Finally, the operating conditions of the cooling water were optimized by minimizing the energy consumption of the water-cooled system. In addition, the factors of different safety ...

Energy-saving and economic analysis of passive radiative sky cooling

Mar 16, 2022 · The widespread application of 4G and the rapid development of 5G technologies dramatically increase the energy consumption of telecommunication base station (TBS). ...

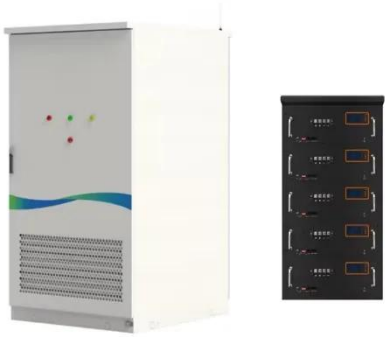


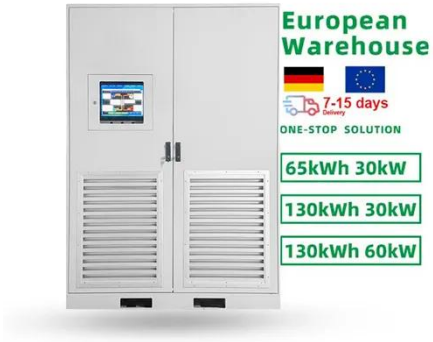
Research on Ventilation Cooling System of Communication Base Stations

Apr 1, 2017 · Abstract This paper proposes a novel ventilation cooling system of communication base station (CBS), which combines with the chimney ventilation and the air conditioner cooling.

Efficient cooling system for outdoor mobile communication base station

May 18, 2011 · A mobile communication base station and cooling system technology, which is applied in the field of high-efficiency cooling system for outdoor mobile communication base ...





Research on ventilation cooling system of communication base stations

Jul 15, 2017 · To meet the design requirements of the green base stations [21], [22] and reduce operation cost of base station, this paper focuses on the effects of building structural design ...

Experimental investigation on the heat transfer performance ...

Apr 1, 2024 · To maintain a stable working environment for communication equipment and reduce the overall energy consumption of 5G communication base stations, it is essential to develop ...

Water-energy Nexus and Coordination Between 5G Base Stations ...

Jul 1, 2022 · To optimize the energy management of base stations (BSs) and the interaction between BSs and the grid are effective ways to reduce the operational costs of 5G BSs while ...

A review of thermal management and innovative cooling strategies ...

Sep 1, 2018 · This paper presents a review on thermal management in data centers and various potential cooling technologies developed respecting energy saving constraint. Numerous ...

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