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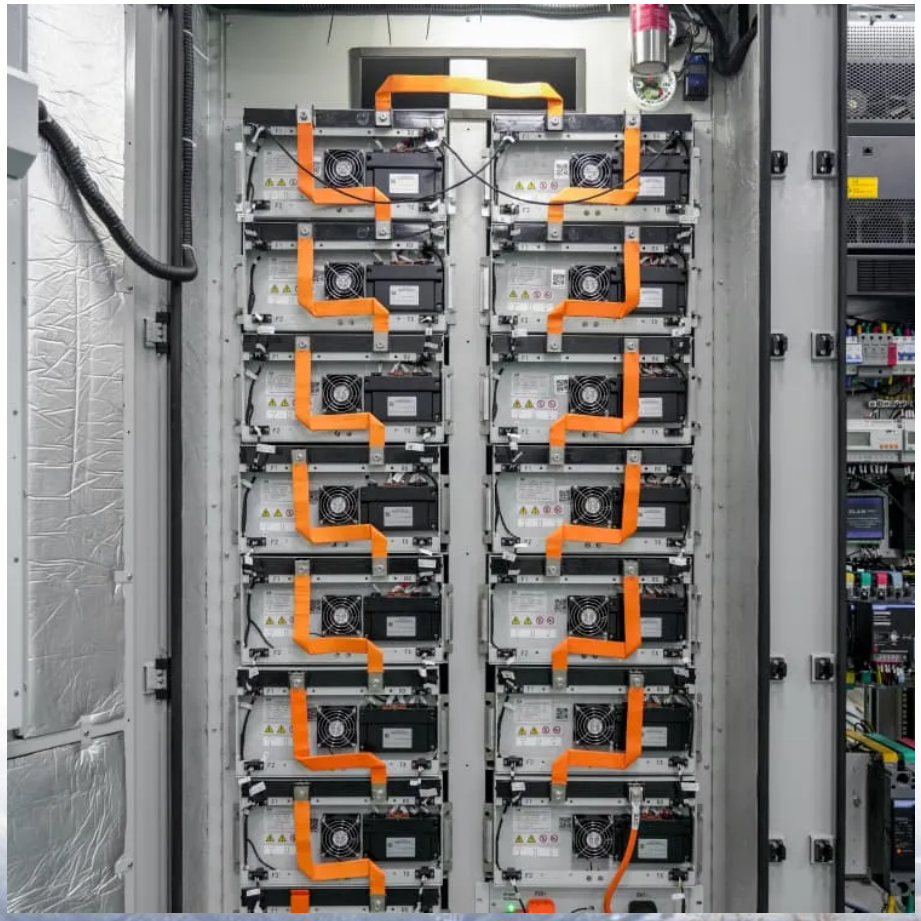
Comparative Test of High Temperature Resistance of Solar Containers for Data Centers



Overview

Can high-temperature data centers save energy?

High-temperature data centers could save large amounts of cooling energy by changing their cooling mechanism. More effective use of “free cooling” is the basic and effective means for high-temperature data centers to reduce cooling energy consumption. It is possible to build chiller-less or even chiller-free data centers.

Is a high-temperature data center a solution?

To tackle this problem, a high-temperature data center is proposed as a fundamental solution. It adopts a different cooling mechanism and makes “chiller-free” data centers possible, facilitating the transition from chiller-based cooling to completely free cooling in data centers.

Does increasing space temperature in data centers reduce mechanical cooling energy?

Thus, raising the space temperature in data centers is expected to reduce the mechanical cooling energy by shortening chiller operating hours. It has been reported that increasing the space temperature in data centers by 1K results in the saving of the total power consumption by 4–5% [20, 21].

What are the limitations of high-temperature data centers?

There are four main limitations in implementing high-temperature data centers concerning servers, as depicted in Fig. 4, including: i. the impact on server reliability; ii. the impact on server performance; iii. the impact on system power consumption; iv. the tradeoff between server cost premium and operating cost saving.

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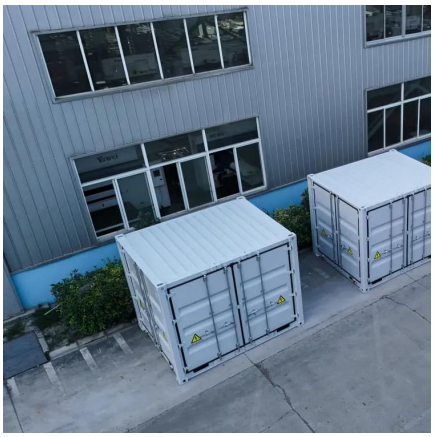

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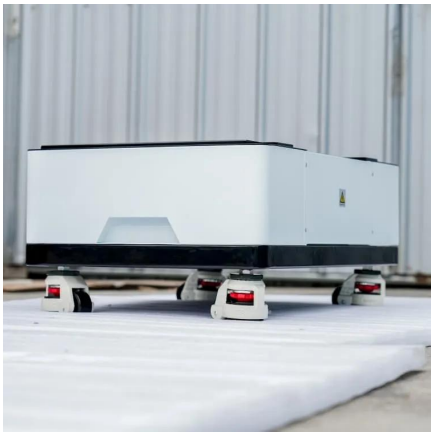

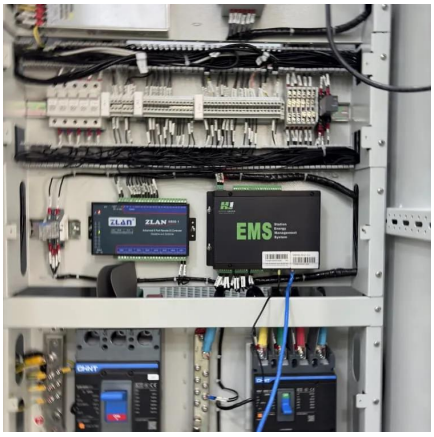

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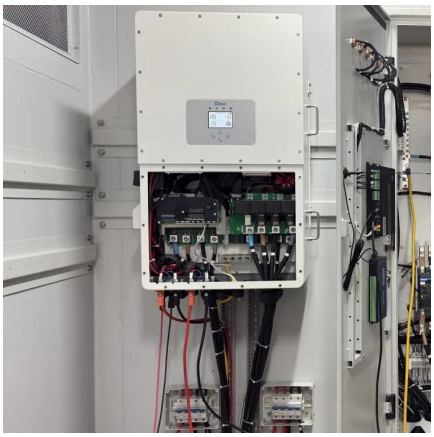

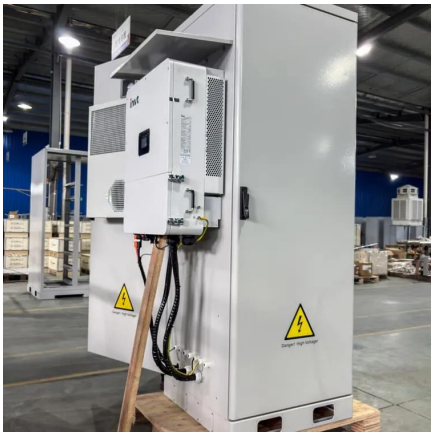

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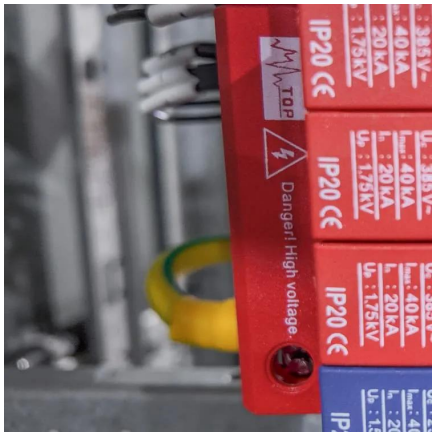

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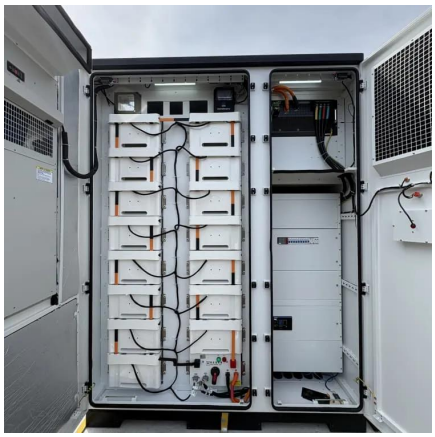

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