

Energy storage system storage temperature



Overview

Thermal energy storage can provide cost-effective benefits for different commercial fields because it allows heat recycling for use, such as in concentrated solar power plants or metallurgical.

What is thermal energy storage?

Thermal energy storages are applied to decouple the temporal offset between heat generation and demand. For increasing the share of fluctuating renewable energy sources, thermal energy storages are undeniably important. Typical applications are heat and cold supply for buildings or in industries as well as in thermal power plants.

What are sensible and latent thermal energy storage?

Sensible, latent, and thermochemical energy storages for different temperatures ranges are investigated with a current special focus on sensible and latent thermal energy storages. Thermochemical heat storage is a technology under development with potentially high-energy densities.

What is thermochemical heat storage?

Thermochemical heat storage is a technology under development with potentially high-energy densities. The binding energy of a working pair, for example, a hydrating salt and water, is used for thermal energy storage in different variants (liquid/solid, open/closed) with strong technological links to adsorption and absorption chillers.

What is a typical storage temperature?

Each application requires different storage temperatures. While for buildings the typical temperature range is between 5 and 90 °C, for industries with process heat applications it is typically between 40 and 250 °C and for solar thermal power plants up to 600 °C.

What are the different types of thermal energy storage?

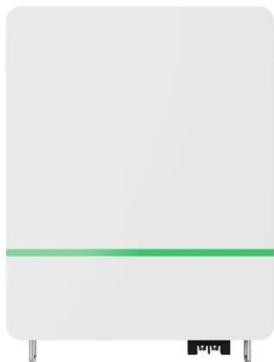
At present, the common methods for TES can be divided into three types:

sensible thermal energy storage (STES), latent thermal energy storage (LTES) and thermochemical energy storage (TCES) . STES is the simplest and most mature technology, and has already been used in commercial CSP plants such as PS10 in Spain and Solar One in USA.

What is thermochemical energy storage (TCES)?

Compared to traditional sensible and latent energy storage, thermochemical energy storage (TCES) offers a greater possibility for stable and efficient energy generation owing to high energy storage densities, long-term storage without heat loss, etc.

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6 Low-temperature thermal energy storage

Sensible storage of heat and cooling uses a liquid or solid storage medium with high heat capacity, for example, water or rock. Latent storage uses the phase change of a material to ...

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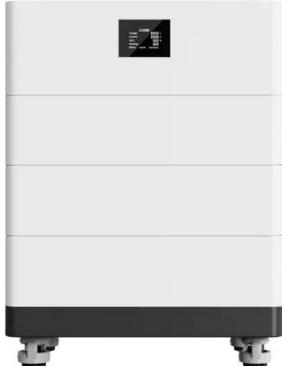
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7 Medium

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100°C to above 500°C. High-temperature technologies can be used for short- or long-term storage, similar to low ...

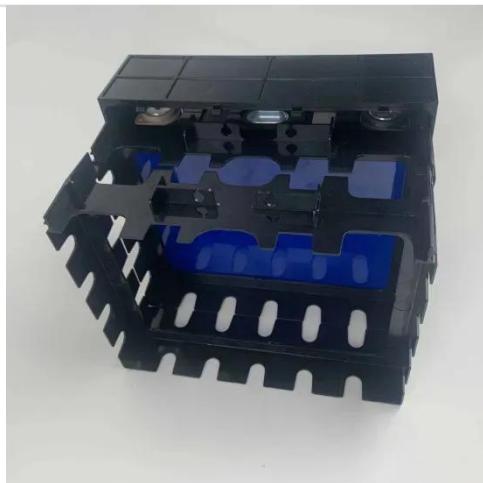
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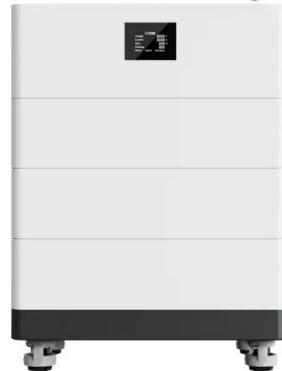
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