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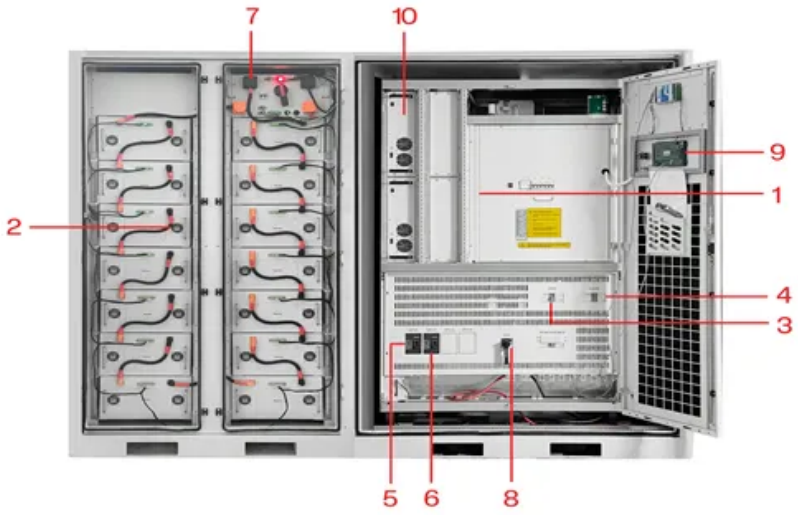
**SolarInnovate Energy Solutions**

# Energy storage system cooling device




| | | | |
|---|---|---|---|
| 1 | PCS Module | 6 | OPV2 side circuit breaker |
| 2 | Battery room | 7 | High Volt Box |
| 3 | Grid side circuit breaker | 8 | BAT side circuit breaker |
| 4 | Load side circuit breaker | 9 | LCD display screen |
| 5 | OPV1 side circuit breaker | 10 | MPPT |

## Overview

What are the different types of cooling systems for electronic packages?

Cooling systems for electronic packages can be broadly categorised into active and passive cooling systems, or a combination of both. Figure 3 provides an overview of the main classifications of active and passive thermal management systems commonly used for cooling PES units.

What is active liquid cooling?

Active Liquid Cooling Thermo-hydrodynamic cooling systems, also known as active liquid cooling systems, represent an advanced approach for cooling electronic packages. These systems utilise coolant liquids, such as water, glycol, and ethylene, to create a high heat-transfer convection capacity within a coolant layer.

What are energy storage systems (PES)?

This includes numerous designs, exploring efficient energy storage technologies such as solid-state batteries, that aim to improve energy density, compactness, safety, durability, and enhancement of overall portability. A PES unit typically comprises a storage system and an inverter for energy conversion.

How does a thermoelectric cooler work?

Thermoelectric coolers serve a cooling capacity spectrum from approximately 10 to 400 Watts, and can cool by removing heat from control sources through convection, conduction, or liquid means. Thermoelectric devices operate using DC power, leaving them less vulnerable to the black-outs and brown-outs that can impact other types of cooling systems.

Are portable energy storage units sustainable?

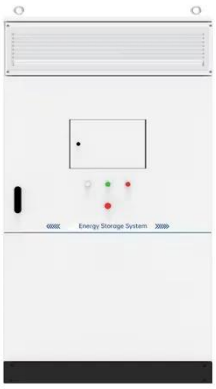
Achieving the global electricity demand and meeting the United Nations sustainable development target on reliable and sustainable energy supply by

2050 are crucial. Portable energy storage (PES) units, powered by solid-state battery cells, can offer a sustainable and cost-effective solution for regions with limited power-grid access.

What is a thermoelectric cooler?

Thermoelectric cooler assemblies also provide precise temperature control with accuracies up to 0.01˚C of the set point temperature, due to their proportional type control system. The operating range for a typical thermoelectric cooler is -40˚C to +65˚C for most systems.

## Energy storage system cooling device



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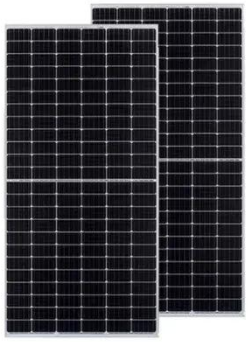

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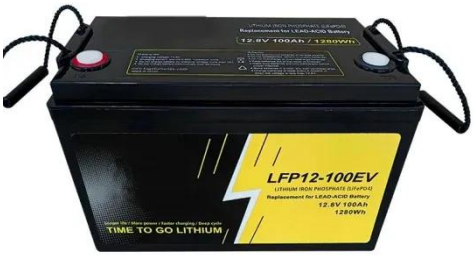


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