SolarTech Power Solutions

Inverter AC voltage automatic control

Overview

How do inverters control AC-side output voltages?

Traditionally, the AC-side output voltages of inverters have been controlled by actuating the pulse-width mod- This work was supported by ERC starting grant 679774. ulation (PWM) blocks through the modulating signals generated by the cas aded inner (current) and outer (volt- age) control loops Pogaku et al. (2007).

What is a voltage source inverter?

Voltage source inverters (VSIs) are commonly used in uninterruptible power supplies (UPS) to generate a regulated AC voltage at the output. Control design of such inverter is challenging because of the unknown nature of load that can be connected to the output of the inverter.

Can direct AC voltage control protect inverters from overcurrent?

The fundamental issue with using direct AC voltage control is its inability to protect inverters against overcurrent. Thus, this paper combines AC voltage control with threshold virtual impedance. The choice of this solution is motivated by the ease of its implementation.

When does a DC inverter start?

The inverter starts as soon as the DC bus voltage is present at a greater level than 10% of the AC maximum. Observe the controlled AC voltage waveform on the output. The frequency and the amplitude of the AC voltage is determined by the values on the powerSUITE page of the solution. If any changes are required, stop the inverter.

Can power inverters operate autonomously?

To operate autonomously, the control law should be changed. Power inverters need to change from following the grid to leading the grid behavior [1, 2, 3, 4]. This capability is known as the "grid-forming" concept, where power

inverters are able to generate an AC voltage with a given amplitude and frequency at the PCC.

How does an inverter work?

The idea is simple, as soon as the output voltage crosses a predetermined danger threshold, a corresponding circuit is triggered which in turn switches OFF the inverter power devices in a consistent manner thereby resulting a controlled output voltage within that particular threshold.

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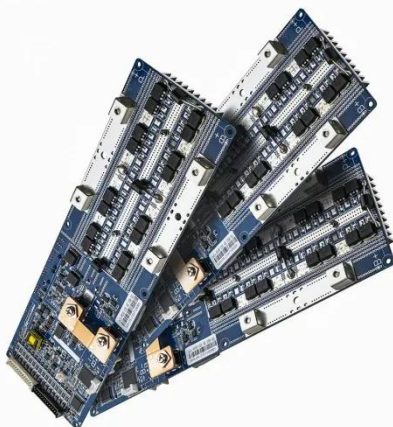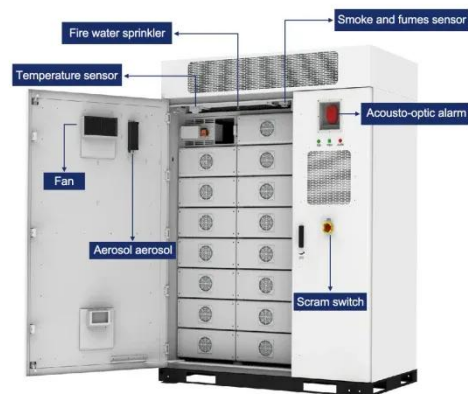
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6. Troubleshooting and Support

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