# From 1000V to 1500V: A Comparison of High and Low Voltage Energy Storage Inverters


In today's rapidly evolving energy storage industry, the PCS (Power Conversion System), as the core component connecting batteries to the grid, directly impacts the efficiency, safety, and economic viability of the entire system. As photovoltaic and energy storage systems advance toward higher voltages and larger capacities, high-voltage PCS has emerged as a new industry trend. So, what advantages does high-voltage PCS offer compared to traditional low-voltage versions?


*ATESS's high-voltage PCS achieves a system efficiency of up to 98.5%*

## High-Voltage PCS: Balancing Efficiency and Cost

Traditional low-voltage PCS typically operates with a DC-side voltage below 1000V, whereas high-voltage versions, such as ATESS PCS series, elevate the voltage to 1500V. This upgrade is not merely a numerical change but a comprehensive optimization spanning system design to operational efficiency. Higher voltages result in lower currents, which reduce cable losses and heat generation, thereby enhancing energy

transmission efficiency. For instance, ATESS's high-voltage PCS achieves a system efficiency of up to 98.5%, significantly surpassing many low-voltage models. Moreover, high-voltage systems require fewer cables and switching devices, lowering initial investment costs, making them particularly suitable for large-scale energy storage power plants and commercial & industrial applications.


*Full-Four-Quadrant-Power for Flexible Energy Management*

## Enhanced Safety and Reliability

Another key advantage of high-voltage PCS lies in its improved system safety. ATESS's PCS series employs advanced bidirectional power conversion technology, supporting full four-quadrant operation and enabling seamless switching between charging and discharging modes. It also integrates intelligent battery management functions, effectively extending battery lifespan. Additionally, the high-voltage design reduces the risk of current overload and, combined with black-start capabilities, ensures rapid power restoration during grid failures, guaranteeing stable operation of critical loads. In contrast, low-voltage systems, under the same power conditions, handle higher currents, placing greater demands on the current-carrying capacity of electrical components and on heat dissipation, which may pose increased safety challenges over long-term operation.


*Max 8-Unit Parallel in Off-Grid Mode*

## Flexible Scalability for Future Needs

For large-scale energy storage projects, system scalability is critical. In off-grid scenarios, ATESS's high-voltage PCS supports parallel operation of up to 8 units, with a total capacity reaching 12MW. This allows users to expand capacity incrementally based on demand, without requiring

substantial upfront investment costs. Such modular design not only lowers initial investment barriers but also reserves space for future expansions. Conversely, traditional low-voltage systems, limited by single-unit power capacities, often require stacking more devices, leading to a larger footprint and system complexity.

**High-Voltage PCS: The Future of Energy Storage**

From a global perspective, 1500V high-voltage systems are gradually becoming the mainstream choice in photovoltaic and energy storage applications. With its PCS1000HV,1200HV,1500HV series, ATESS not only meets the market's demand for efficient, safe, and flexible energy storage solutions but also drives the industry toward higher voltage and smarter technologies through innovation. For users, choosing high-voltage PCS translates to lower levelized cost of electricity, higher energy utilization rates, and sustainable operational capabilities for the future.

In today's era of rapid iteration of energy storage technology, the shift to higher voltage levels is not merely a numerical change but a comprehensive leap in system performance. With high-voltage PCS at its core, ATESS is empowering the industry to stride toward a more efficient and reliable energy future.