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TITAN SERIES

Battery Energy Storage System

Titan 5MWh-2.5MW-CTP

The Titan 5MWh–2.5MW-CTP is a fully integrated, liquid-cooled energy storage container designed for high-capacity commercial and utility-scale applications. Built with LFP battery technology, integrated active cell balancing, and advanced liquid thermal management, the Titan 5MWh–2.5MW-CTP ensures uniform state-of-charge across all cells, maximizing usable capacity, improving round-trip efficiency, and extending battery service life.

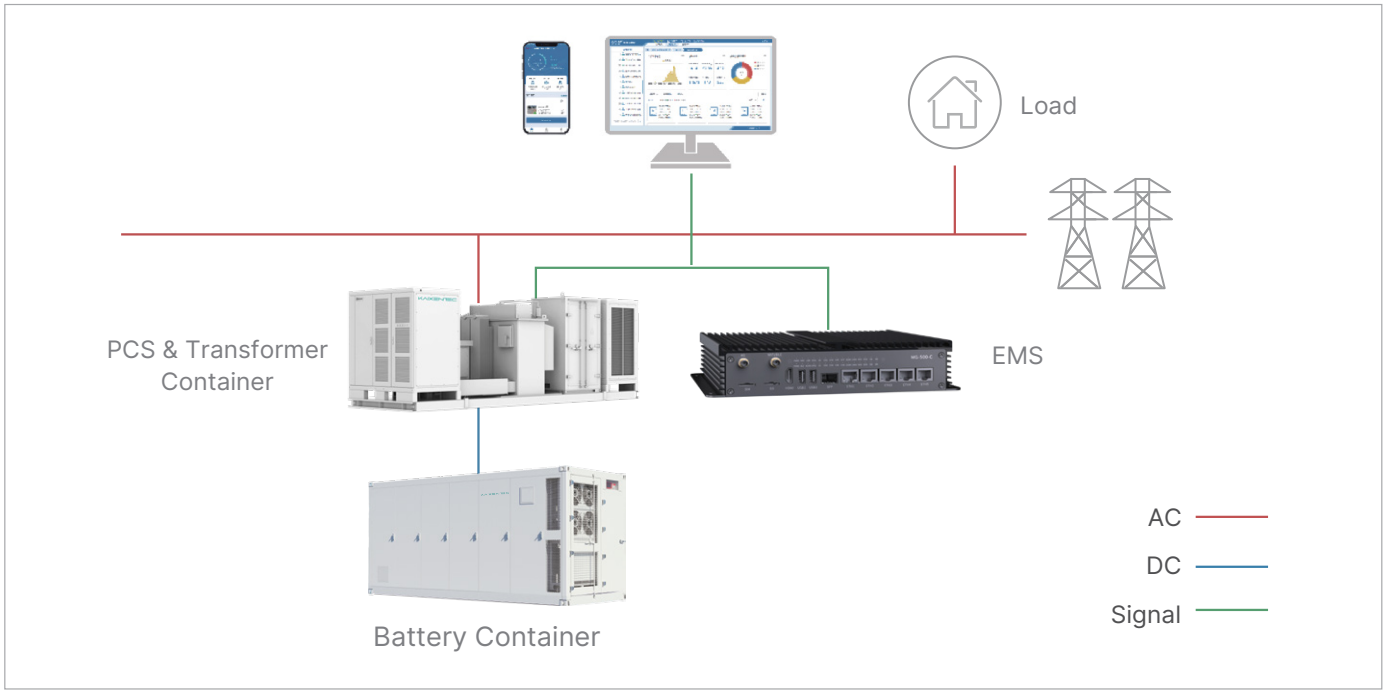
With a 5MWh energy capacity and 2.5MW output, Titan supports both user-side and grid-side scenarios, including peak shaving, load shifting, renewable smoothing, and emergency backup. Intelligent EMS and multi-terminal cloud monitoring ensure real-time visibility and control across all conditions.

Its liquid cooling system maintains battery temperature differences below 2 °C, enhancing performance and extending lifespan. Active cell balancing continuously equalizes state-of-charge across all cells, reducing degradation and extending overall system lifetime. Multi-level fire protection, early fault warning, and IP54-rated enclosures ensure operational safety and environmental durability.

Titan offers simplified deployment with standard communication protocols and flexible expansion on both DC and AC sides. It is the ideal choice for smart energy infrastructure requiring high reliability, scalability, and long-term value.

User-side Energy Storage System Solutions

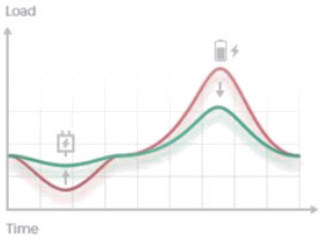
System Topology



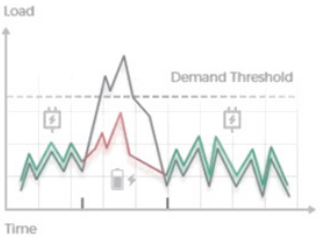
Industrial and commercial energy storage systems are increasingly deployed in high-demand environments such as smart cities, industrial parks, commercial zones, and office complexes - enabling intelligent energy management and operational efficiency across diverse applications.

Main application models of user-side energy storage

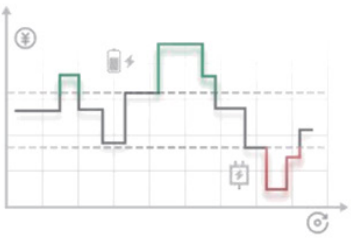
① Peak shaving and valley filling:



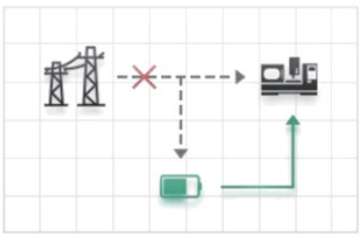
② Demand response:



③ Electricity trading:



④ Off-grid backup power supply:



01 Reduce peaks and fill valleys

By charging during off-peak hours for energy storage and discharging during peak hours for energy supply, the electricity costs of enterprises or parks can be reduced, saving electricity bills for customers at the power consumption end.

02 Off-grid backup power supply

In the event of a power outage, provide uninterrupted short-term power supply to important loads to reduce economic losses caused by sudden power failure of the loads.

03 Electricity trading

On the electricity market trading platform, short-term electricity trading is conducted in combination with load forecasting to maximize profits.

04 Demand response

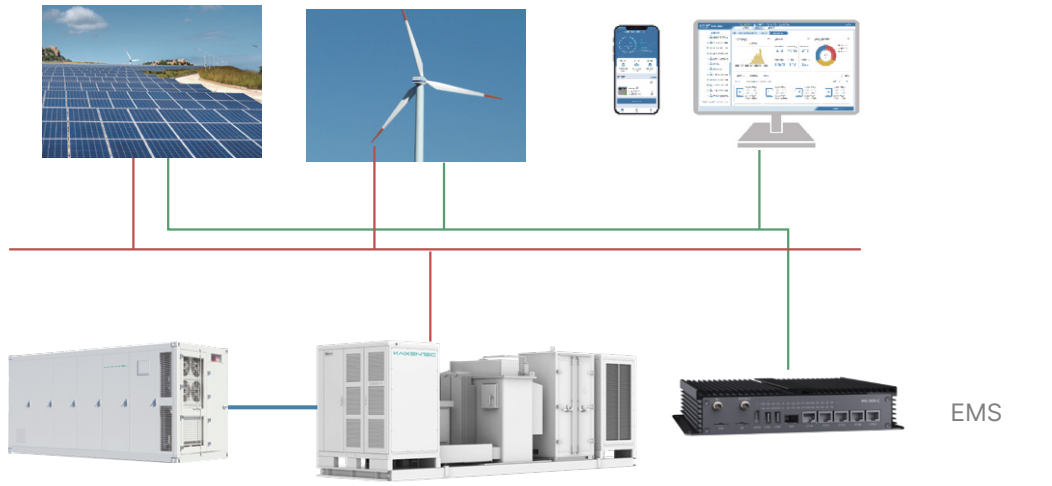
When the short-term power consumption exceeds the capacity of the transformer, the energy storage system discharges rapidly to meet the power demand of the load.

Power-side Energy Storage System Solutions

New energy generation, such as wind and solar, is inherently dependent on natural conditions, resulting in significant output fluctuations. At the same time, user demand often varies throughout the day, creating peaks and troughs that do not align with renewable generation profiles and leading to curtailment or wasted energy.

When paired with energy storage, wind and photovoltaic systems can achieve far more stable and controllable power output. Storage smooths generation variability, enhances dispatch accuracy, and improves both the economic value and predictability of renewable resources. It also increases grid-integration capacity, strengthens power quality, and reduces curtailment. In addition, energy storage contributes to system optimization by supporting peak shaving, frequency regulation, and reactive power compensation.

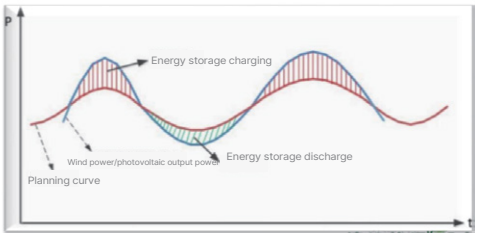
System Topology



Main applications models of power-side energy storage

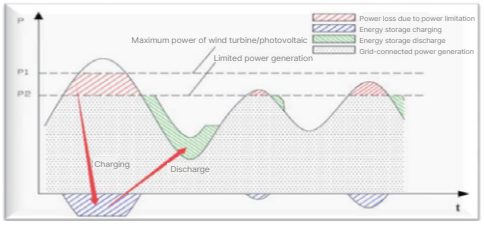
01 Reduce the waste of wind and solar energy

Address the insufficient capacity of the power grid, alleviate the problem of wind and solar power curtailment from renewable energy sources, and enhance energy utilization efficiency.



02 Track the planned output curve

To address the intermittent and fluctuating defects of new energy power generation, achieve smooth and controllable power supply.



Titan Series Technical Parameters

Model	Titan 5MWh DC side
Dc side parameters	
Battery type	Lithium iron phosphate battery
Cell capacity	314Ah
Combination method	416S1P*12
Nominal voltage	1331.2V
Voltage range	1081.6-1497.6V
Nominal electricity quantity	5MWh
Charge and discharge rate	0.5C
Other parameters	
Operating temperature range	-20-55°C(>45°C,Reduce power)
Operating humidity range	5%~95%(No condensation)
Operating altitude requirements	3000m(>3000m,the credit limit must be reduced)
Temperature control scheme	Liquid cooling
Fire protection plan	aerosol + water spray
Protection grade	IP54
Anti-corrosion grade	C4
Noise	<80db
Seismic resistance grade	Level 8
Entry and exit methods	Bottom in, bottom out
Dimension(L*W*H)	6058*2438*2896mm
Communication protocol	Modbus-RTU,Modbus-TCP,IEC104,etc
Communication methods	RS485，Ethemet，Dry contacts, etc

* The actual product may differ slightly from the pictures.
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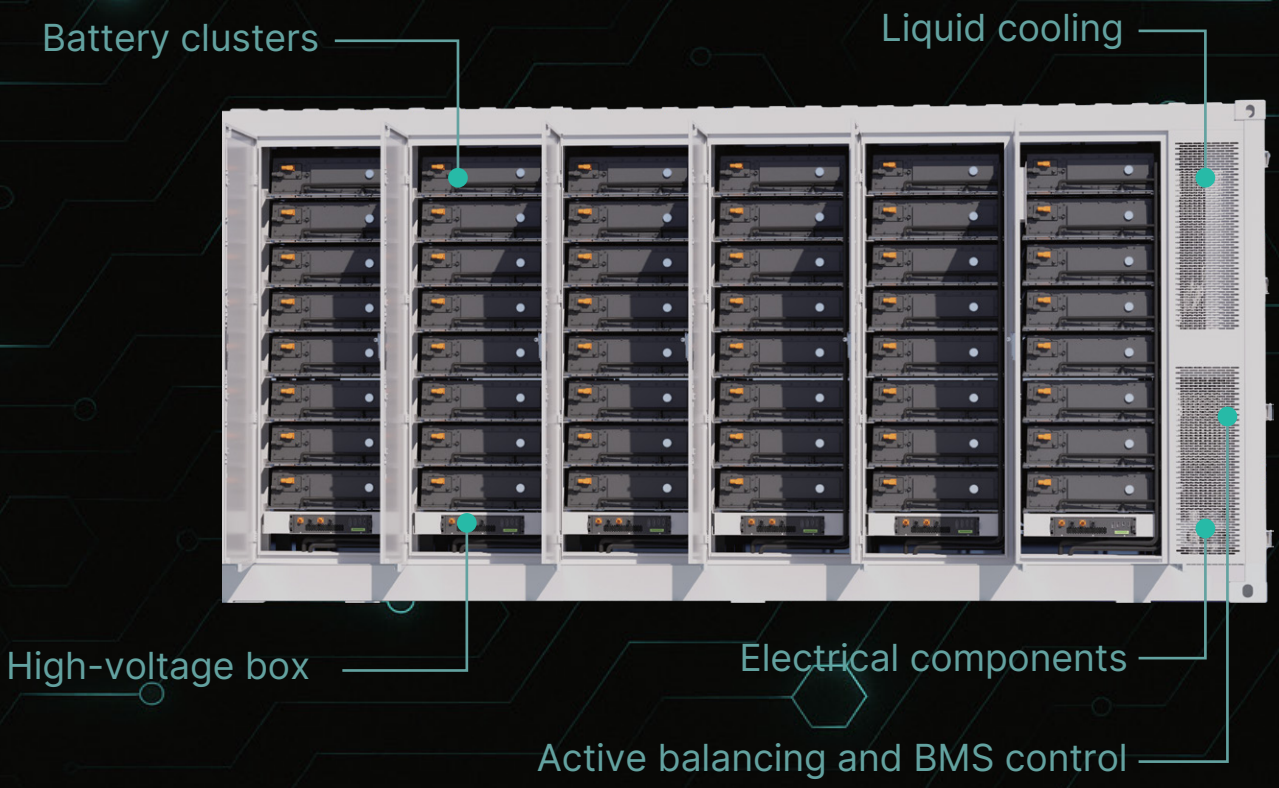
Internal System Architecture



Flexible Capacity Expansion

- Supports DC-side scalability with up to 16 cabinets in parallel.
- Easily adaptable to meet varying capacity demands across deployment sce-

Maximized System Availability

- Optimized cluster-level management ensures system availability above 99%
- Enhances energy utilization and operational stability. annually.

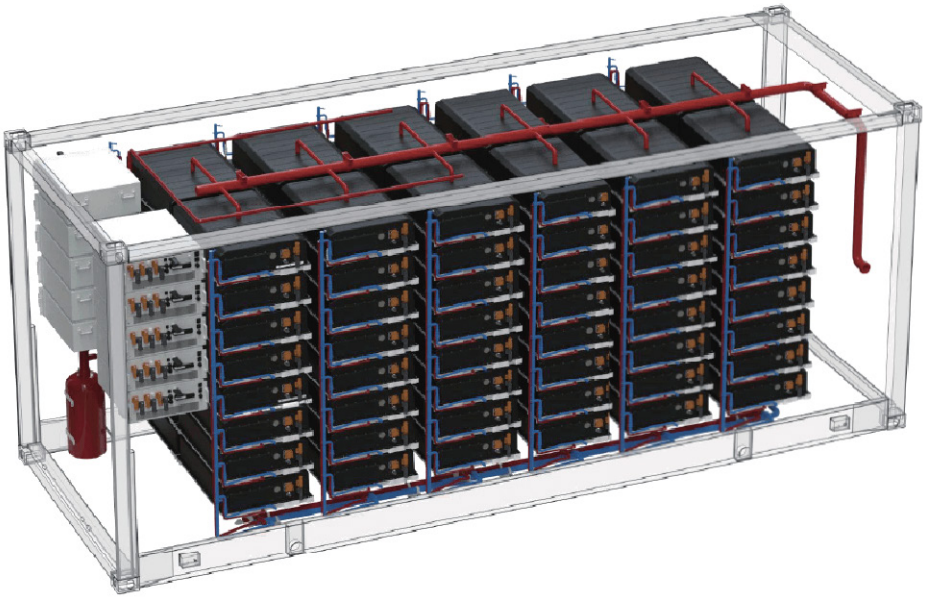
Intelligent Management

- Active cell balancing and AI-driven energy management improve usable capacity, charging efficiency, and long-term battery consistency.
- Smart scheduling adjusts to load profiles and generation patterns.

Extended System Lifespan

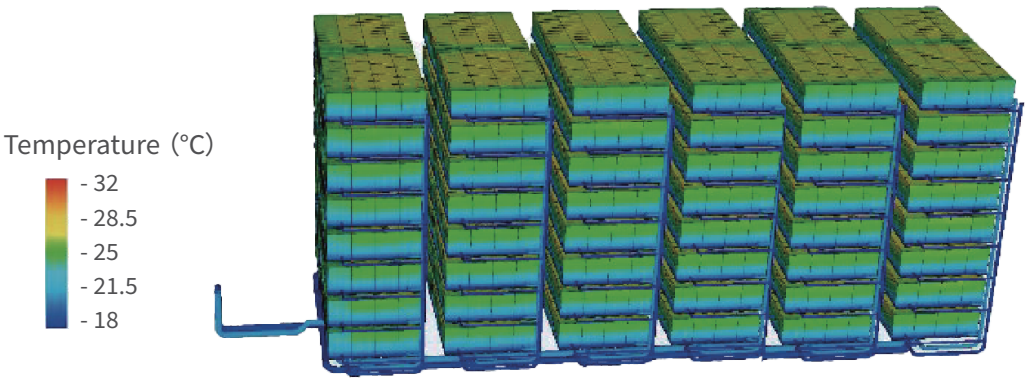
- Refined control strategies increase battery cycle life by over 3%.
- Predictive analytics reduce degradation and extend service time.

Advanced Fire Protection



- Advanced multi-level fire protection enhanced by intelligent AI fault prediction.

Intelligent Thermal Control



- Intelligent temperature equalization maintains cell temperature difference within 2 °C, improving thermal balance and extending battery cycle life.

TITAN SERIES

Battery Energy Storage System

PCS & Transformer

Highly Integrated System Design

- The Titan 5MWh–2.5MW-CTP integrates bidirectional PCS, installed with integrated step-up transformer, MV switchgear, and protection, enabling rapid deployment and grid-compliant operation.

Grid-friendly

- Support dual network port, support IEC61850 protocol integration data acquisition and fiber ring network, intelligent operation management support high/low voltage traversal, meet the network type technical requirements.

Flexible Functional Configuration

- Supports multi-unit parallel operation and advanced functions including Virtual Synchronous Generator (VSG) mode, Constant Power Control (PQ) mode, Constant Voltage/Frequency (VF) mode, and black start. The 1500 V system offers a wide DC voltage range and customizable terminal configurations for various energy storage scenarios.

PCS & Transformer Technical Parameters

Model	Titan 2.5MW AC side
Dc parameters	
Maximum DC voltage	1500Vdc
DC working voltage range	1000-1500 Vdc
Maximum direct current	Depends on PCS branch count, 300A per module
Grid-connected output feature	
Rated output power	2500kW
Rated grid-connected voltage	690Vac
Allowable grid voltage range	-10%-10% (The range can be set)
Rated grid frequency	50HZ/ 60Hz
Maximum output current	2886A (Depends on PCS count)
Power factor/Adjustable range	>0.99(Rated output power)/ 1(leading) -1(lagging)
Reactive power regulation range	-105%-105%
THDi	<3% (Rated output power)
Efficiency	
Maximum efficiency	98.5% (Inverter Max)
Transformer	
Rated power of transformer	2700KVA@45ºC
Voltage transformation ratio	0.69/(6-35)kV
Transformer category	Oil Immersed
Basic parameters	
Protection grade	IP54 overall (transformer IP68)
Working environment temperature	-20°C-60°C
Relative humidity	0-100% (no condensation)
Cooling method	Forced air (PCS) + oil cooling (transformer)
Dimension(L*W*H)	8000x2553x2200mm
Weight	≤20T
Maximum working altitude	1000m (>2000m, customized)
Communication protocol	RS485, CAN, Ethernet (via gateway)
Communication method	Modbus, CAN, TCP/IP via system integration

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Energy Management System (EMS)

Summary

The EMS supports a wide range of functions, including real-time data acquisition, protocol conversion, energy management, lightweight edge computing, and local interface display. Integrated with the cloud management platform, it enables advanced features such as electricity consumption tracking, revenue analysis, intelligent O&M, alarm diagnostics, and fine-grained system control.

It is ideally suited for applications such as transformer zone management, industrial and commercial energy storage, integrated charging and storage systems, and photovoltaic-storage microgrids. The system is compatible with multiple communication protocols, including IEC61850, IEC104, Modbus, TCP/IP, DL/T645, MQTT, and HTTP.

Powered by AI-based optimization algorithms, the EMS supports forecasting and dispatching of renewable generation, demand-side response, charging infrastructure, building loads, and production schedules. This enables efficient use of renewable resources, dynamic load balancing, and comprehensive economic and carbon optimization across microgrid environments.

Product features

- High real-time performance, supporting data collection at the millisecond second level;
- High compatibility, compatible with devices from third-party manufacturers and supporting commonly used industry protocols;
- Rich peripheral interfaces;
- Supports multiple control strategies, such as peak shaving and valley filling, demand control, peak-valley arbitrage, and orderly charging, etc.
- Support carbon emission management;
- Optimal AI algorithm optimization
- Anti-reverse flow, anti-overload;
- Have local security controls;

EMS Technical Parameters

Model	Titan500-EMS	Remarks
System resources		
CPU	Four-core Cortex-A55	
NPU	1TOPS	
Main frequency	2GHz	Highest frequency
Memory	2GB/4GB LPDDR4	The memory can be optionally equipped with 2GB or 4GB
Storage	32GB+128G SSD	SSD solid-state drives are optional
System	Linux	
Peripheral resources		
Power supply	Dual-channel redundancy	DC 9~36V
Gigabit Ethernet	1(10/100/1000Mbps)	Optical port and electrical port are optional
100 Megabit Ethernet	4(10/100Mbps)	Ethernet in the same network segment
RS485	8	Isolated type
RS232	2	Isolated type
CAN	2	Isolated type
DI	4	
DO	4	For signal use only
start	2	
HDMI2.0	1	
Wireless communication	WiFi/BLE、4G/5G	Optional 5G
SIM card		
SD card		
Indicator light	30	
Environmental parameters		
Working temperature	-25~55°C	
Working humidity	5%~95%(No condensation and no freezing)	
Working altitude	Below 3000 meters	
Mechanical properties		
Mechanical dimensions	200x235x52 mm	
Protection grade	IP50	

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