

Utility-scale BESS Solutions

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Tecloman's Utility-scale BESS Solutions are mainly applied to energy storage for renewable energy power stations, utilising the characteristics of energy storage in terms of time-shift and fast response to smooth out fluctuations in renewable energy output and enhance the grid stability. additionally, they can be used for peak frequency regulation, utility-scale user-side applications and utility-scale micro-grid system.

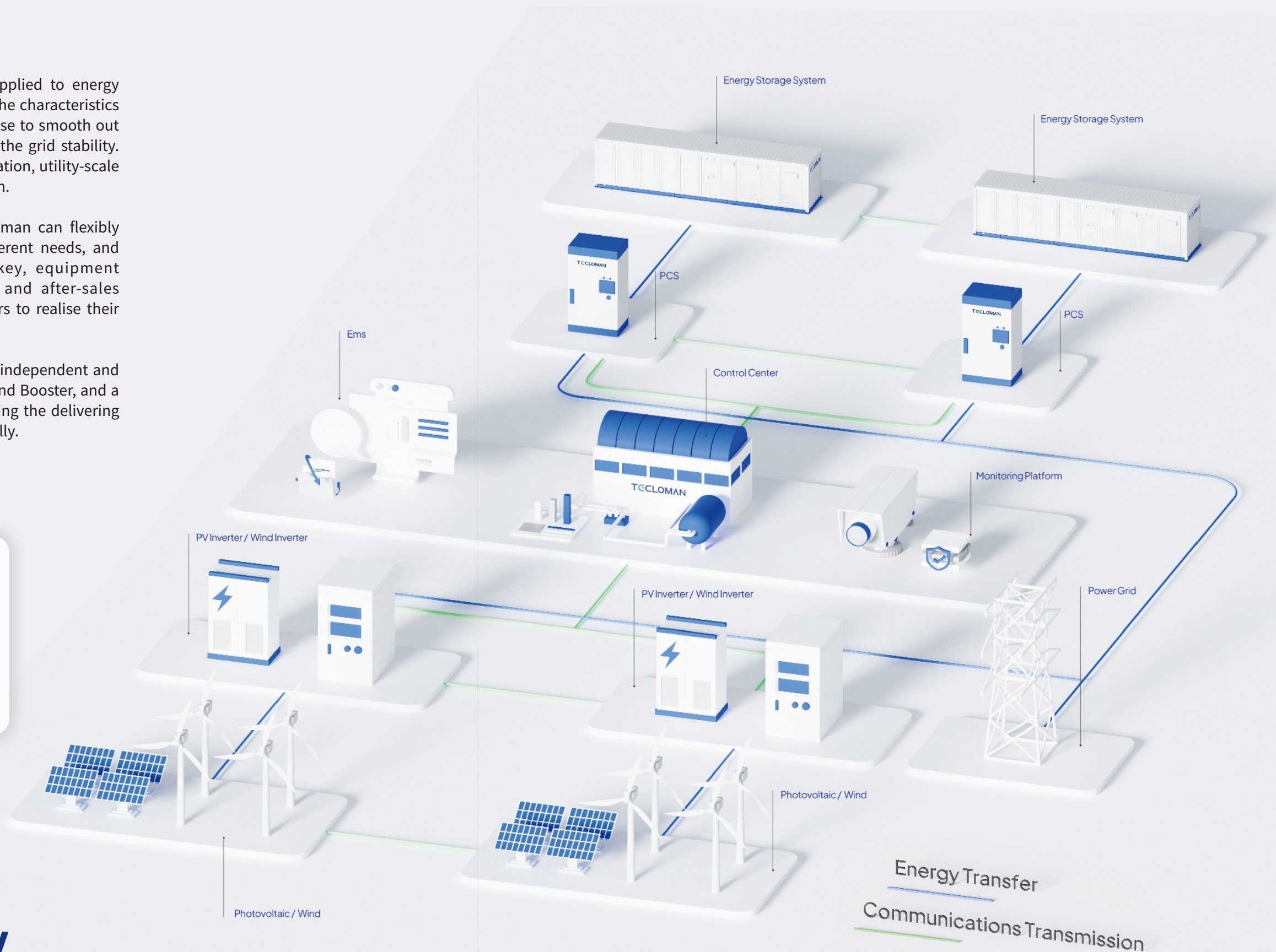
Through the standardised DC and AC modules, Tecloman can flexibly configure energy storage power stations to meet different needs, and comprehensive services ranging from EPC turnkey, equipment production, grid connection and commissioning, and after-sales operation and maintenance services. helping customers to realise their projects quickly and cost-effectively.

Tecloman has a 5GWh battery module production line, independent and autonomous R&D and production capabilities for PCS and Booster, and a professional engineering and construction team, enabling the delivering over 5GWh of utility-scale energy storage projects annually.

Application Scenarios

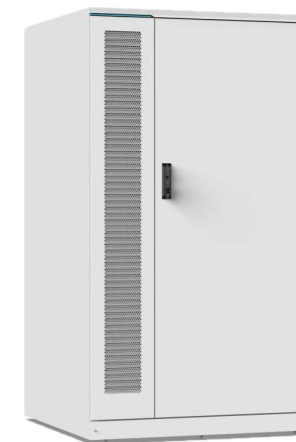
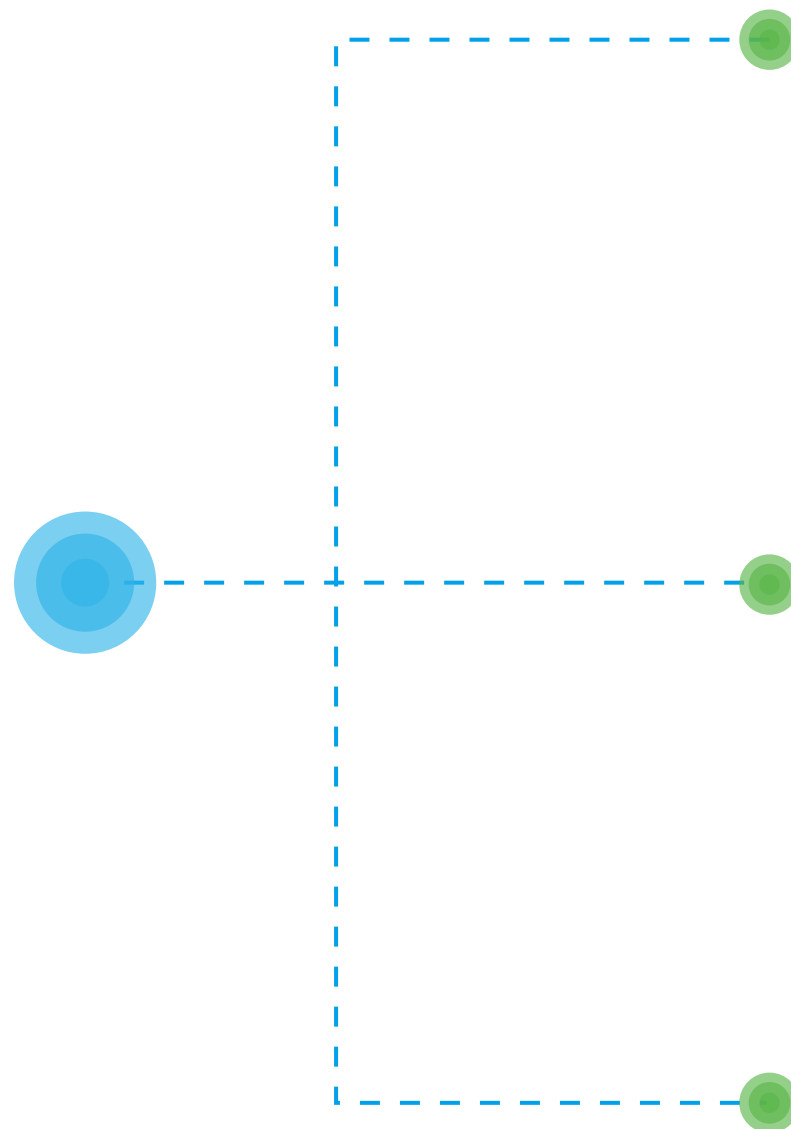
-  **Renewable Energy Consumption**
-  **Shared Energy Storage Plant**
-  **Peak Power and Frequency Regulation**
-  **Utility-scale User-side Energy Storage**
-  **Microgrid**

System Topology



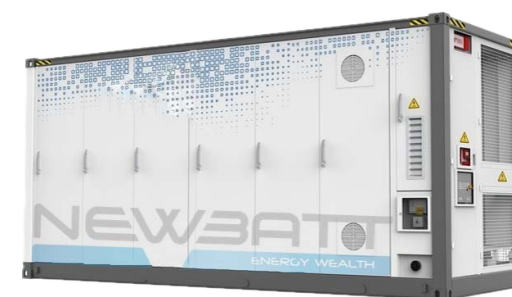
1500V PCS-MV Substation

TBVS-2500K-TH/TBVS-2750K-TH
TBVS-3150K-TH/TBVS-3450K-TH
TBVS-5000K-TH



TRACK Outdoor Liquid-cooled Battery Cabinets

TRACK-1500-372-L
TRACK-1500-417-L



Liquid-cooled Prefabricated Cabin Energy Storage Battery System

TBAT-3727-15-L
TBAT-5016-15-L



Air-cooled Prefabricated Cabin Energy Storage Battery System

TBAT-5017-15-A
TBAT-5016-15-A

1500V PCS-MV Substation

TBVS-2500K-TH

TBVS-2750K-TH

TBVS-3150K-TH

TBVS-3450K-TH

TBVS-5000K-TH



Product Overview

The integrated energy storage converter and booster is a standardized energy storage, converter and booster AC substation system designed for large-scale or ultra-large-scale energy storage power plants. The system integrates energy storage converter, high and low voltage distribution equipment, step-up transformer and auxiliary power supply system. The prefabricated design meets the requirements of rapid on-site installation and delivery. Supporting 6~35kV grid access, it is suitable for various scenarios such as distributed energy storage power stations, independent energy storage power stations, industrial and commercial energy storage power stations, and off-grid energy storage power stations, etc., it also has the capacity to adapt to the extreme environments such as high temperatures high altitudes, and high salt fog.



High degree of system integration, "change" and "rise" all-in-one.



High space utilization and rational layout.



High safety performance, AC and DC multi-level protection.



High conversion efficiency, ANPC three-level energy storage converter.



Practical features, PQ, VF, structure network multi-running mode.



Good experience, easy to install, easy to commission, operate and maintain.

model	TBVS-2500K-TH	TBVS-2750K-TH	TBVS-3150K-TH	TBVS-3450K-TH	TBVS-5000K-TH
DC					
Max. Voltage	1500V				
Voltage Range	800 ~ 1500V	800 ~ 1500V	915 ~ 1500V	1000 ~ 1500V	1000 ~ 1500V
Max. Current	3500A	3858A	3864A	3872A	6000A
Grid Tied					
Rated Power	2500kW	2750kW	3150kW	3450kW	5000kW
Max. Capacity	2750kVA	3025kVA	3465kVA	3795kVA	6000kVA
Rated Voltage	550V	550V	630V	690V	690V
Voltage Range	-15% ~ 10% (Configurable)				
Frequency	50Hz / 60Hz				
Max. Output Current	3176A				5020A
Power Factor	-1 leading ~ 1 lagging				
THDI	<3% (Rating)				
Off-grid					
Rated Voltage	550V	550V	630V	690V	690V
Max. Output Current	3176A				5020A
THDU	<3% (linear load)				
Frequency	50Hz / 60Hz				
Efficiency					
Max. Efficiency	99.03%				
Transformer Parameters					
Rated Capacity	2500kVA	2750kVA	3150kVA	3450kVA	5000kVA
Voltage Ratio	0.55 / (6~35) kV	0.55 / (6~35) kV	0.63 / (6~35) kV	0.69 / (6~35) kV	0.69 / (6~35) kV
Transformer Type	Dry change / Oil change				
Basic Parameters					
IP Level	IP54				
Operating Temperature	-35℃ ~ 60℃ (>50℃ derating)				
Relative Humidity	≤95%RH, without condensation				
Cooling	Forced air				
Max. Altitude	4000m (>2000m derating)				
Communication Interface	RS485 / Ethernet				
Cmmunication Protocol	Modbus-RTU / Modbus-TCP / IEC61850 / IEC104				

TRACK Outdoor Liquid-cooled Battery Cabinets

TRACK-1500-372-L

TRACK-1500-417-L



Product Overview

TRACK outdoor liquid-cooled battery cabinets adopt a modular design concept, equipped with efficient liquid-cooled battery modules and heat dissipation design to deliver ultra-high energy density. Compared with the containerized system, TRACK is more flexible, and the transportation and on-site assembly work is greatly simplified. The system consists of Li-FePO4 battery modules, battery management system(BMS), liquid-cooled air-conditioning, fire-fighting system, etc. The TRACK can be connected to power conversion system(PCS) alone. or used in parallel. It can be widely applied in various energy storage scenarios, such as renewable energy consumption, peak shaving and valley filling, emergency power backup, and dynamic capacity increase.

- High-efficiency liquid-cooling technology, temperature difference $\leq 3^{\circ}\text{C}$.
- Built-in independent fire-fighting system.
- 280AH large monomer battery core, laser welding process.
- Intelligent BMS system, real-time monitoring of system safety.
- All-in-one cabinet design.
- IP54
- Outdoor direct installation.
- New heat-insulating refractory material, fire-resistant 2h.

Model	TRACK-1500-372-L	TRACK-1500-417-L
Cell Model	280Ah	314Ah
Cell Type	LiFePO4	
Formation Method	1P416S	
Rated Voltage	1331.2V	
Voltage Range	1206.4V ~ 1456V	
Rated Power	372.736kWh	417.996kWh
Rated Charging/Discharging Power	186kW	208kW
Rated Charge/Discharge Current	140A	157A
Max. Continuous Charge/Discharge Current	280A	157A
Charge/Discharge Efficiency	$\geq 95\%$	
Battery Cluster Internal Resistance	$\leq 20\text{m}\Omega$	
Cycle Life	≥ 6000 次 (0.5C, 25°C, 80%EOL, 90%DOD)	
Operating Temperature	Charging: 0 ~ 55°C; Discharge: 20 ~ 55°C	
Recommended Storage Temperature	15 ~ 35°C	
Relative Humidity	0 ~ 90%RH	
Max. Allowable Altitude	4000m (>2000m derating)	
Self-consumption/month	$\leq 3\%$	
Cooling	Liquid Cooling	
Production Process	Laser Welding	
Communication	CAN / RS485 / Dry Contact	
Weight	4T	
Dimension (W×D×H)	1300mm×1300mm×2300mm	
Certificates	EMC/FCC/UN38.3/UL1973/EN62477-1/IEC62619/IEC60529/UL9540A	Not for now

Liquid-cooled Prefabricated Cabin Energy Storage Battery System

TBAT-3727-15-L

TBAT-5016-15-L



Product Overview

Liquid-cooled prefabricated cabin energy storage battery system is a large-capacity battery energy storage device with standardized design, which can be flexibly assembled. This product integrates energy storage battery, bms, convergence cabinet, temperature control system and fire protection system, and can be used with mainstream energy storage converters for various energy storage application scenarios. The new generation 5mwh liquid-cooled product features a highly integrated structural design, which can significantly save land and shorten the construction period for users.



20 feet max 5MWh, high energy density.



Intelligent liquid-cooled heat pipe system, the temperature difference inside the box <3°C.



High altitude design, up to 5000m.



Customizable thickened thermal insulation layer, adaptable to high cold environment.



C3 corrosion rating for up to 25 years of life.



Fully loaded for transportation and quick installation.



Active fire safety system.



Emergency water fire protection system interface.



Model	TBAT-3727-15-L	TBAT-5016-15-L
Container Specifications	20 Feet	20 Feet
Voltage Level	1500V	1500V
Battery Type	LiFePO4	
Unit Capacity	280Ah	314Ah
Module Specifications	1P52S	1P104S
Number of Module Strings per Cluster	8	4
Max. Voltage Per Unit	3.6V	3.6V
Min. Voltage Per Unit	2.8V	2.8V
Grouping Method	1P416S	1P416S
Battery Clusters	10	12
Nominal Voltage	1331.2V	1331.2V
Voltage Range	1164.8~1497.6V	1164.8~1497.6V
Nominal Capacity	2800Ah	3768Ah
Nominal Power	3.727MWh	5.016MWh
Charge/Discharge Ratio	0.5C	
Charge/Discharge Current	1400A	1884A
Operating Temperature	-25 ~ 50°C	
Cooling	Liquid cooling	
Relative Humidity	≤95%RH, without condensation	
Max. Altitude	≤4000m (Customized for 3000m or more)	
IP Level	IP54	
Anti-corrosion grade	C3	
Fire Protection	CF3CHFCF3 / C6F12O / Aerosols	
Weight	28T	43T
Dimensions (W×D×H)	6058×2600×2896 mm	6058×2438×2896 mm



High Voltage Box Battery Module Liquid Cooling Piping

Liquid Cooler
Converging Cabinet

Air-cooled Prefabricated Cabin Energy Storage Battery System

TBAT-5017-15-A

TBAT-5016-15-A



Product Overview

Air-cooled prefabricated cabin energy storage battery system is a large-capacity battery energy storage device with standardized design and flexible configuration. This product integrates energy storage battery, BMS, convergence cabinet, temperature control system and fire protection system, and can be used with mainstream energy storage converters for various energy storage application scenarios. The new generation 5MWh air-cooled product adopts a distributed air-conditioning solution with excellent temperature control performance and making it particularly suitable for cold and high-altitude environments. The highly integrated structural design of the product can significantly save land and shorten the construction period for users.



40 feet maximum 6.7MWh, high energy density.



Intelligent air-cooled heat pipe system, temperature difference inside the box <5°C.



High altitude design, up to 5000m.



Customizable thickened thermal insulation layer, adaptable to high cold environment.



C3 corrosion rating for up to 25 years of life.



Fully loaded for transportation and quick installation.



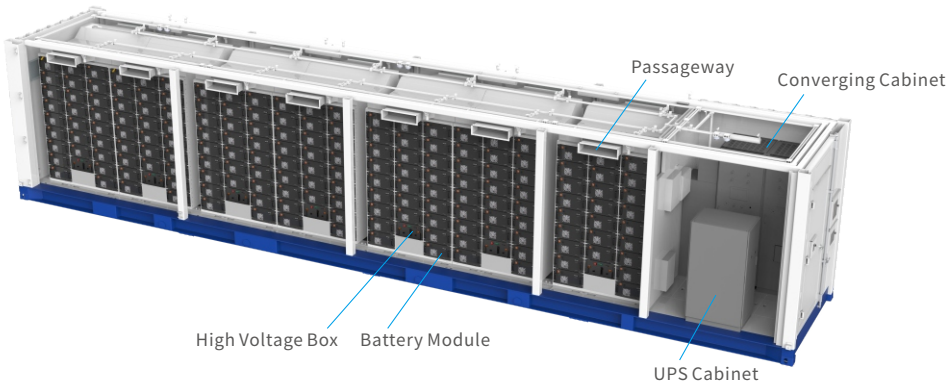
Active fire safety system.



Emergency water fire protection system interface.



Model	TBAT-3727-15-L	TBAT-5016-15-L
Container Specifications	40 Feet	20 Feet
Voltage Level	1500V	1500V
Battery Type	LiFePO4	
Unit Capacity	280Ah	314Ah
Single Cluster Module Specifications	25	1P104S
Number of module strings	16	4
Max. Voltage Per Unit	3.6V	3.6V
Min. Voltage Per Unit	2.8V	2.8V
Grouping Method	1P400S	1P416S
Battery Clusters	14	12
Nominal Voltage	1280V	1331.2V
Voltage Range	1120~1400V	1164.8~1497.6V
Nominal Capacity	3920Ah	3768Ah
Nominal Power	5.018MWh	5.016MWh
Charge/Discharge Ratio	0.5C	
Charge/Discharge Current	1960A	1884A
Operating Temperature	-25 ~ 50°C	
Cooling	Air cooling	
Relative Humidity	≤95%RH, without condensation	
Max. Altitude	≤5000m (Customized for 3000m or more)	
IP Level	IP54	
Anti-corrosion grade	C3	
Fire Protection	CF3CHFCF3 / C6F120 / Aerosols	
Weight	52T	43T
Dimensions (W×D×H)	13716×2438×3015 mm	6058×2438×2896 mm



1500V BESS PCS

TPCS-1250

TPCS-1375

TPCS-1575

TPCS-1725

TPCS-2500



Product Overview

The 1500V BESS PCS is a wide DC voltage range AC/DC bi-directional converter with high power density and small footprint, which is suitable for high-power grid-connected and off-grid applications.



Efficient conversion



Three-level topology, maximum efficiency of 99%.



Intelligent air-cooling, no derating at 50°C.



Wide DC operating voltage range, 1500V for full load operation.



Safe And Reliable



High protection class (IP54, C3).



DC side 250kA short circuit current breaking capacity.



Linkage with BMS and EMS to support multiple system protection.



Application Flexibility



Four-quadrant operation, with battery charge/discharge management function.



VSG, VF, PQ and other operating modes.



Support black start.



Grid Support



With a frequency, source network and load fast scheduling function.



With inertia, frequency, voltage, and other dynamic support functions.

Model	TPCS-1250	TPCS-1375	TPCS-1575	TPCS-1725	TPCS-2500
DC					
Max. Voltage	1500V				
Voltage Range	800~1500V	800~1500V	915~1500V	1000~1500V	1000~1500V
Max. Current	1935A	1935A	1935A	1935A	3000A
Grid					
Rated Power	1250kW	1375kW	1575kW	1725kW	2500kW
Max. Capacity	1375kVA	1513kVA	1733kVA	1898kVA	3000kVA
Max. Current	1443A @ 45°C / 1587A @ 30°C			2092A @ 45°C / 2510A @ 30°C	
Access Method	3P3L				
Isolation Method	Unisolated				
Reactive Power Range	-100%~100%				
Rated Voltage	550V	550V	630V	690V	690V
Voltage Range	484~605V	484~605V	554~693V	607~759V	607~759V
Frequency	50Hz/60Hz				
Frequency Range	±5Hz				
Total Harmonic Distortion Rate Of Current	≤3% (Rated power)				
Power Factor	>0.99 (Rated power)				
Charge/discharge Conversion Time	<100ms				
Off-grid					
Rated Voltage	550V	550V	630V	690V	690V
Voltage Deviation	<1%UN (Linear balanced load)				
Voltage Unbalance	<0.5%UN (Linear balanced load)				
Voltage Total Harmonic Distortion Rate	<3% (Linear load)				
Frequency	50Hz/60Hz				
Unbalanced Load Carrying Capacity	100%				
Protection					
DC Input Protection	Disconnect switches + Fuses				
AC Output Protection	Interrupter				
Surge Protection	DC Type II / AC Type II				
Insulation Monitori	Yes				
Overheating Protection	Yes				
System					
Inlet Method	Bottom feed				
Max. Efficiency	>99%				
Overload Capacity	110% for long-time; 120% for 1min				
Operating Temperature	-35°C~ 60°C (>45°C derating operation, < -20°C heating start)				
Relative Humidity	0% ~ 100%RH, without condensation				
Max. Altitude	5000m, (>2000m derating)				
Noises	<80dB				
Dimension (W×D×H)	1080×1480×2405mm			1080×2380×2444mm	
IP Level	>IP54				
Cooling	Forced air				
Communication Interface	RS485, Ethernet				
Cmmunication Protocol	MODBUS-RTU, MODBUS-TCP, IEC61850 (GOOSE & MMS) , IEC104				
Certifications					
Certification Standards	GB/T 34120, GB/T 34133				