

# Utility-scale BESS Solutions



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Tecloman utility-scale energy storage solutions are primarily used for energy storage systems supporting renewable energy power plants. By leveraging the time-shifting and rapid response capabilities of energy storage, these solutions mitigate fluctuations in renewable energy output and enhance grid stability. They can also be used for peak shaving and frequency regulation, as well as in large-scale consumer-side and large-scale microgrid systems.

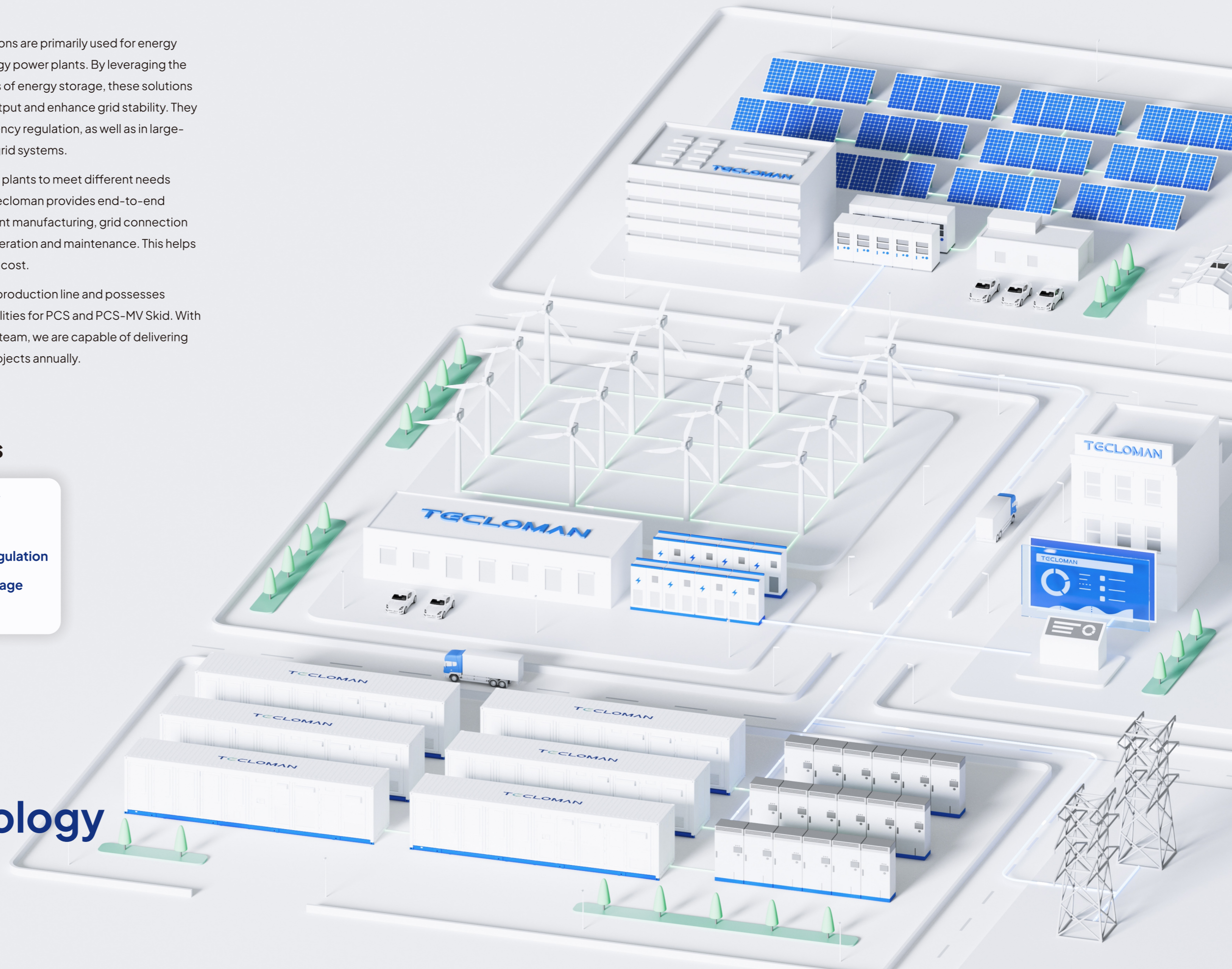
By flexibly configuring energy storage power plants to meet different needs through standardized DC and AC modules, Tecloman provides end-to-end services covering EPC contracting, equipment manufacturing, grid connection and commissioning, as well as after-sales operation and maintenance. This helps customers rapidly implement projects at low cost.

Tecloman operates a 5GWh battery module production line and possesses independent R&D and manufacturing capabilities for PCS and PCS-MV Skid. With a professional engineering and construction team, we are capable of delivering over 5GWh of large-scale energy storage projects annually.

## Application Scenarios

-  Integration of renewable energy
-  Shared Energy Storage Station
-  Peak Shaving and Frequency Regulation
-  Large-scale on-site energy storage
-  Microgrid

## System Topology





### Medium-Voltage Box-Type Transformer

TSWG-4000-TH  
TSWG-5000-TH  
TSWG-6000-TH



### String-type AC/DC Integrated Container

TESS-1800-6250-LRE-AC  
TESS-2500-5016

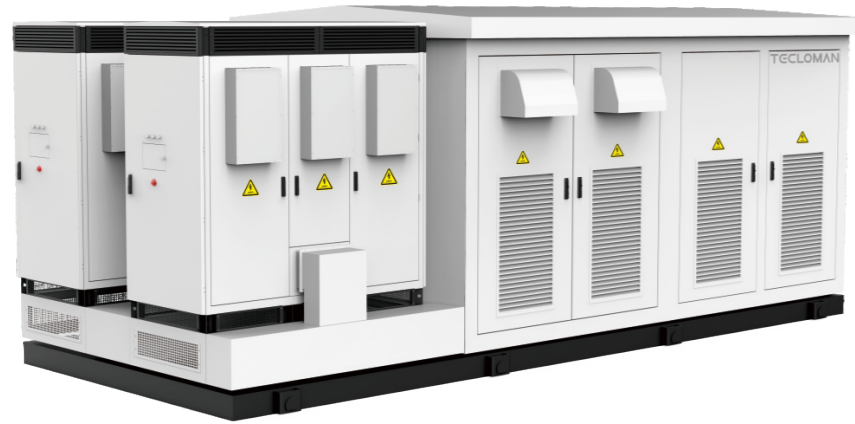


### PCS String-type PCS

TPCS-500

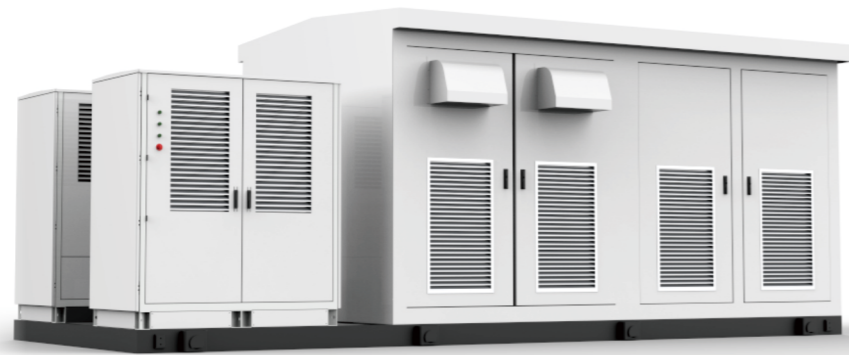
## String-type solution

Meets the requirements for 2-hour grid-following and 4-hour grid-forming energy storage systems



### Integrated PCS-MV Skid

TBVS-3450K-TH  
TBVS-5000K-TH

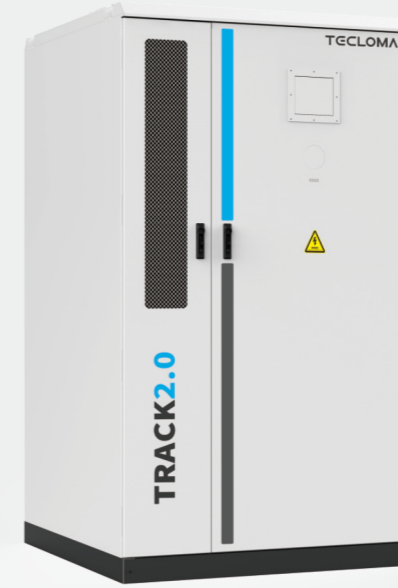


### String-type PCS-MV Skid

TBVS-5000M-TH  
TBVS-6250M-TH

## Centralized Solution

Meets the grid integration and configuration requirements of a 2-hour energy storage system



UL 1973  
UL 9540A

### Liquid-cooled battery cabinet

TRACK-1500-417-Y



### Liquid-cooled prefabricated energy storage battery system

TBAT-5016-15-L  
TESS-1800-6250-LRE  
TESS-3125-6250-LRE

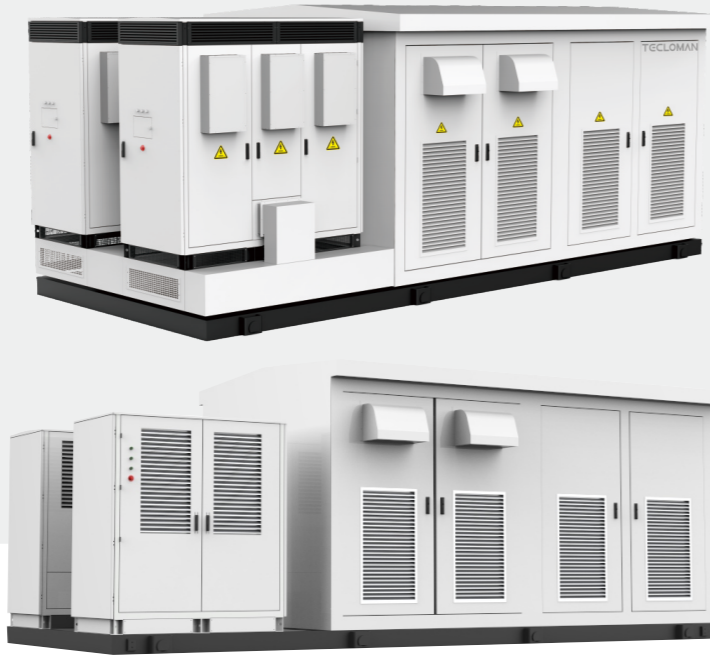
# 1500V Integrated PCS-MV Skid

TBVS-5000K-TH

TBVS-5000M-TH

TBVS-6250M-TH

TBVS-6250K-TH




## Product Overview


The Energy Storage Converter and Step-up Integrated Unit is a standardized AC substation system integrating energy storage conversion and voltage step-up functions, designed for large-scale and ultra-large-scale energy storage power plants.

The system integrates energy storage converters (PCS), high- and low-voltage power distribution equipment, step-up transformers, and auxiliary power supply systems. With a prefabricated design, it enables rapid on-site installation and commissioning.


It supports grid connection at voltage levels ranging from 6 kV to 35 kV and is suitable for a wide range of applications, including co-located energy storage plants, standalone energy storage plants, commercial and industrial (C&I) energy storage systems, and off-grid energy storage systems.


The system is designed to operate reliably under extreme environmental conditions, including high-altitude, low-temperature, high-temperature, and high salt spray environments.


 Highly integrated system with combined conversion and step-up functions

 High conversion efficiency with ANPC three-level energy storage converter

 Efficient space utilization with optimized layout

 Multiple functional modes supported, including PQ, VF, and grid-forming operation

 High safety performance with multi-level AC/DC protection

 User-friendly design with easy installation, commissioning, and maintenance

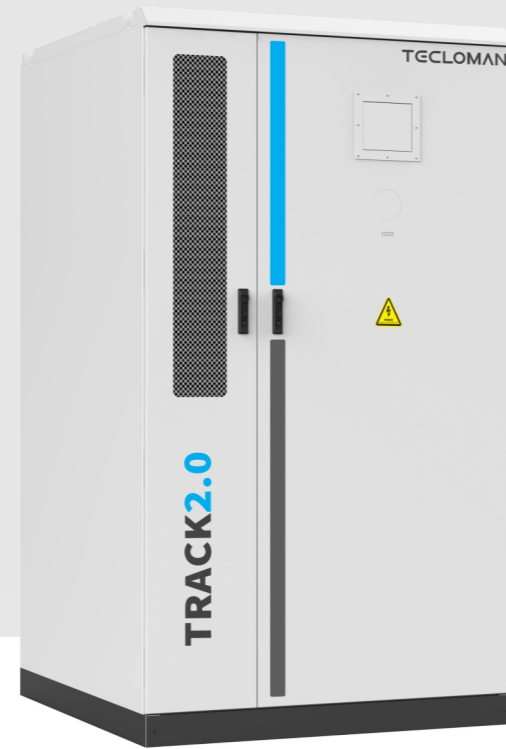
Model	TBVS-5000M-TH	TBVS-5000K-TH	TBVS-6250M-TH	TBVS-6250K-TH
<b>DC Side</b>				
Maximum DC Voltage	1500V			
DC Voltage Range	1000 ~1500V			
Maximum DC Current	6000A			7500A
Grid-connected	5000kW			6250kW
Rated Power	5000kVA			6250kVA
<b>Maximum Capacity</b>				
Rated Voltage	690V			
Voltage Range	-15% to +10% (adjustable range)			
Rated Frequency	50Hz/60Hz			
Maximum Output Current	5020A			6276A
Power Factor	-1 (leading) to 1 (lagging)			
THDi	<3% (linear load)			
<b>Off-grid</b>				
Rated Voltage	690V			
Maximum Output Current	5020A			6276A
THDu (Total Harmonic Distortion of Voltage)	<3% (linear load)			
Rated Frequency	50Hz/60Hz			
<b>Transformer</b>				
Rated Capacity	5000kVA			6250kVA
Voltage Ratio	0.69/(6~35)kV			
Transformer Type	Dry-type / Oil-immersed transformer			
<b>General Specifications</b>				
IP Rating	IP54			
Operating Ambient Temperature	-35°C to 60°C (>50°C derating)			
Relative Humidity	≤95% RH, non-condensing			
Cooling Method	Smart air cooling			
Maximum Operating Altitude	4000 m (>2000 m derating)			
Communication Interface	RS485/Ethernet			
Communication Protocol	Modbus-RTU/Modbus-TCP /IEC61850/IEC104			

# TRACK 2.0

Outdoor liquid-cooled battery energy storage cabinet

Track-499-630-Y


Track-665-630-Y




## Product Overview


The outdoor liquid-cooled battery cabinet, based on an "All-in-One" modular integrated architecture, integrates battery clusters (1 to 8 PACKs), BMS, liquid cooling air conditioner, fire protection, and thermal management systems into a single standardized cabinet. It can be connected individually or used in parallel with PCS, featuring a small footprint, high reliability, easy installation, flexible scalability, convenient maintenance, and high system efficiency. It is suitable for various application scenarios such as microgrids, emergency backup power, peak shaving and valley filling, and distributed renewable energy integration.


 Out-door cabinet design enables direct outdoor installation.

 High overall performance with a built-in NFPA 69-compliant independent fire suppression system.


 Compatible with 1000V/1500V systems.


 Intelligent BMS system with real-time monitoring for enhanced system safety.

 High-efficiency liquid cooling technology with a temperature difference  $\leq 4^{\circ}\text{C}$ .

 Advanced thermal insulation and fire-resistant materials with a fire resistance rating of 2 hours.

 Ip54.

 High energy density.

 Active equalization: Effectively control the battery pressure difference, and increase the energy usage rate by more than 20% in the whole life cycle of the system.

Model	Track-499-630-Y	Track-665-630-Y
Cell type	LFP 3.2V/315Ah	
Configuration	2P156S	2P208S
Nominal capacity	630Ah	630Ah
Nominal power	314kWh	419kWh
Nominal voltage	499.2VDC	665.6VDC
Operating Voltage Range	436.8~561.6 VDC	582.4~748.8VDC
Nominal charge/discharge current	315A	
Max. charge/discharge current	400A	
Low voltage power supply mode	220V~50/60HZ 20A(Non-UPS power supply)	
Charge/discharge efficiency	$\geq 95\%$ (without auxiliary consumption)	
Cycle life	$\geq 6000$ Cycles	
Operating Temperature	Charging temperature: 0~55°C, Discharging temperature: -20~55°C	
Recommended operating temperature	15°C~ 40°C	
Storage temperature	Within one month: -30°C~+55°C, 90%RH Max ; Within three months: -10°C~+45°C, 90%RH Max ; Recommended storage temperature:-10°C~+ 25°C,85%RH Max)	
Altitude	$\leq 4000$ m	
Thermal management mode	Liquid-cooled	
Equalisation	Active / Passive	
Relative humidity	5~90%RH	
IP grade	Ip54	
Dimension WxDxH	1300×1300×2320mm(±5mm)	
Weight	$\approx 3098\text{kg}$	$\approx 3814\text{kg}$
Communication mode	Modbus / CAN2.0 / Rs485	
Certificates	IEC62477-1 , IEC61000-6-2/4, IEC62619 , UL1973 , UI9540A , UN38.3 , under certification	

# Ymir 5K









Liquid-cooled prefabricated energy storage battery system

TESS-2500-5016

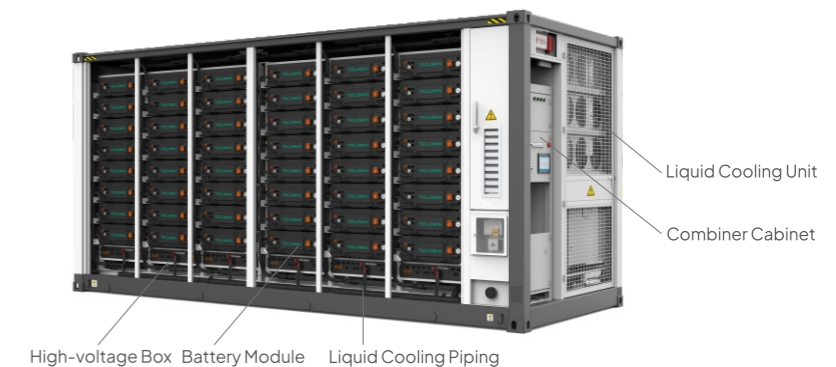


## Product Overview

The liquid-cooled prefabricated energy storage battery system is a high-capacity battery storage solution featuring a standardized design and flexible configuration. The system integrates energy storage batteries, an advanced Battery Management System (BMS), power distribution, temperature control, and fire protection into a single unit, and can be used in conjunction with mainstream energy storage converters (PCS) for a wide range of applications. The new generation 5 MWh liquid-cooled product features a highly integrated structural design, significantly reducing footprint and shortening installation time for users.

-  20-ft 5 MWh system with 30% higher energy density
-  Intelligent liquid cooling thermal management with  $\leq 3^{\circ}\text{C}$  temperature difference inside the container
-  High-altitude design, supporting up to 5000 m
-  Customizable insulation thickness for cold-climate applications
-  C3 anti-corrosion rating with a design life of up to 25 years
-  Factory pre-assembled for transportation and rapid installation
-  Active fire protection system
-  Interface for emergency firefighting system

Model	TBAT-5016-15-L
Container Size	20 ft
Voltage Class	1500V
Battery Chemistry	Lithium Iron Phosphate (LFP)
Cell Capacity	314Ah
Module Configuration	1P104S
Modules per Cluster	4
Nominal Cell Voltage	3.6V
Minimum Cell Voltage	2.8V
System Configuration	1P416S
Number of Clusters	12
Nominal Voltage	1331.2V
Voltage Range	1164.8~1497.6V
Nominal Capacity	3768Ah
Nominal Energy	5.016MWh
Charge/Discharge Rate	0.5C
Charge/Discharge Current	1884A
Operating Temperature	-25~50°C
Cooling Method	Liquid cooling
Relative Humidity	$\leq 95\%$ RH, non-condensing
Operating Altitude	$\leq 5000$ m (customized above 3000 m)
Ingress Protection	IP54
Corrosion Protection	C3
Fire Protection	Heptafluoropropane / Aerosol
Weight	43T
Dimensions (W x D x H)	6058x2438x2896mm



# Ymir 6K Plus

## 6.25MWh Liquid-Cooled Energy Storage Container

TESS-1800-6250-LRE-AC



### Product Overview

TESS-1800-6250-LRE-AC is an energy storage system, and more importantly, a standardized, integrated AC/DC intelligent power unit. Inside a standard 20-foot container, we have unprecedentedly integrated a 6.25MWh battery system with a 1.8MW PCS inverter, creating the ultimate product form of "One Container, One Station". It achieves built-in full functionality from DC energy storage to AC grid connection, thoroughly simplifying the traditionally complex power station integration work into on-site connection and commissioning, bringing unprecedented deployment speed and investment efficiency to customers.

Integrated Design: High protection rating, easy installation and transportation.

Fire Safety: Reliable integration of intelligent temperature control and fire management, improving the system's fire safety protection.

Certification: All components within the system are CE certified, facilitating overall system transportation.

Safety Design: Independent battery and electrical space design, enhancing safety protection levels.

Versatile Applications: Meets multiple application scenarios such as renewable energy absorption, microgrids, and peak shaving.

Model	TESS-1800-6250-LRE-AC
Dc Side Parameters	
Cell Type	LFP-587Ah
Module Configuration	8P416S
Charge/discharge Duration	4h
Rated Power	1800KW
Rated Energy	6.25MWh
Rated Voltage	1331.2Vdc
Operating Voltage Range	1123.2~1497.6Vdc
Ac Side Parameters	
Rated Power	450kW*4
Grid Voltage Range	690V (-15%~10%)
Grid Frequency Range	50Hz/60Hz±2.5Hz
Current Harmonics	≤3%(Full Load)
Power Factor	-0.99~+0.99
Other Parameters	
IP Rating	CONTAINER IP55
Cooling Method	Liquid Cooling
Balancing Method	Active Balancing / Passive Balancing
Fire Suppression System	Container-level Aerosol
Auxiliary Power Supply	480VAC/60HZ
Cycle Life	≥ 6000 cycles (80%EOL)
Operating Temperature	-30°C ~ +55°C
Operating Humidity	0~95%RH, Non-condensing
Operating Altitude	≤4000m(Derating ≥2000m)
Dimensions(w×d×h)	6058*2438*2896 (W*D*H) mm
Weight	≤50t
Communication Interface	Ethernet/CAN/RS485



# Ymir 6K

## 6.25MWh Liquid-Cooled Energy Storage Container









TESS-1800-6250-LRE

TESS-3125-6250-LRE



### Product Overview

The 6.25MWh liquid-cooled container is a groundbreaking product that sets a new industry benchmark for energy density. Within a standard 20-foot container, we have achieved an ultra-high storage capacity of 6.25MWh. Powered by top-tier cells, an innovative architecture, and comprehensive safety design, it delivers the ultimate solution for customers—offering a smaller footprint, faster deployment, and higher returns.

-  Integrated design with a high protection rating for easy installation and transportation.
-  The independent battery and electrical compartment design enhances the overall safety level.
-  The integrated intelligent temperature control and fire management system enhances overall fire safety.
-  Meets multiple application scenarios such as new energy consumption, microgrids, and peak shaving
-  Designed for high-altitude applications up to 4,000 m
-  All components in the system pass CE certification, meeting overall system transportation requirements
-  New insulation materials improve thermal insulation rate
-  Intelligent liquid cooling heat pipe system, intra-bundle temperature difference  $\leq 3^{\circ}\text{C}$

Model	TESS-1800-6250-LRE	TESS-3125-6250-LRE
Basic Parameters		
Cell Type	LFP-587Ah	
Configuration	8P416S	
Convergence Method	8 clusters to 1 bus / 8 clusters to 2 buses	
Charge/Discharge Duration	4h	2h
Rated Power	1562KW	3125KW
Rated Energy	6.25MWh	
Rated Voltage	1331.2VDC	
Operating Voltage Range	1123.2~1497.6VDC	
IP Rating	ContainerIP55	
Cooling Method	Liquid Cooling	
Balancing Method	Active Balancing / Passive Balancing	
Fire Suppression System	Cabin-grade Aerosol	
Auxiliary Power Supply	480VAC/60Hz	
Cycle Life	$\geq 6000$ cycles 80%EOL	
Operating Temperature	$-30^{\circ}\text{C} \sim +55^{\circ}\text{C}$	
Operating Humidity	0~95%RH, non-condensing	
Altitude	Up to 4,000 m (derating above 2,000 m)	
Dimensions(WxDxH)	6058*2438*2896mm	
Weight	$\leq 50\text{T}$	
Communication Interface	Ethernet/CAN/RS485	



# 1500V Energy Storage PCS

TPCS-2500



## Product Overview

The 1500 V energy storage inverter is a bidirectional AC/DC inverter with a wide DC voltage range, featuring high power density and a compact footprint. It is suitable for both grid-connected and off-grid applications.

### High Efficiency

- ANPC three-level topology with peak efficiency up to 99%
- Wide DC voltage range enabling full-power operation at 1500 V
- Smart air cooling with no derating up to 50°C ambient temperature

### Safety & Reliability

- High protection rating (IP54, C3)
- DC fault waveform recording and analysis capability up to 250 kA
- Integrated with BMS and EMS for multi-level system protection

### Flexible Applications

- Four-quadrant operation with advanced charge/discharge management
- Supports multiple operating modes, including SVG, VF, and PQ
- Black start capability supported

### Grid Support

- Fast active/reactive power response for grid support
- Supports dynamic control of voltage, frequency, and power

Model	TPCS-2500
<b>DC Parameters</b>	
Maximum DC Voltage	1500V
DC Voltage Range	1000-1500V
Maximum DC Current	3000A
<b>AC Grid-connected Parameters</b>	
Rated Power	2500kW
Maximum Capacity	3000kVA
Maximum Current	2092A @ 45°C / 2510A @ 30°C
Grid Connection Method	Three-phase, three-wire
Isolation Method	Transformerless
Active Power Control	-100%-100%
Rated Voltage	690V
Voltage Range	607-759V
Rated Frequency	50Hz/60Hz
Frequency Range	±5Hz
Maximum Output Harmonic Distortion	≤3% (at rated power)
Power Factor	>0.99 (at rated power)
Charge/Discharge Response Time	<100ms
<b>AC Off-grid Parameters</b>	
Rated Voltage	690V
Voltage Deviation	<1%UN (linear balanced load)
Voltage Unbalance	<0.5%UN (linear balanced load)
THDU	<3% (linear load)
Rated Frequency	50Hz/60Hz
Unbalanced Load Capability	100%
<b>Protection &amp; Monitoring</b>	
DC Input Protection	Isolation switch + fuse
AC Output Protection	Circuit breaker
Surge Protection	DC Type II / AC Type II
Insulation Monitoring	Available
Overtemperature Protection	Available
<b>System</b>	
Cable Entry Method	Bottom cable entry
Maximum Efficiency	>99%
Overload Capacity	1.1x overload for continuous operation, 1.2x overload for 1 min
Allowable Ambient Temperature	-35°C to 60°C (<45°C derating, <-20°C heating start-up)
Allowable Relative Humidity	0-100% RH, non-condensing
Maximum Operating Altitude	5000 m (>2000 m derating)
Noise (dB)	<80
Dimensions (W x D x H)	1080x2380x2444mm
IP Rating	>Ip54
Cooling Method	Smart air cooling
Communication Interface	Rs485, Ethernet
Communication Protocol	MODBUS-RTU, MODBUS-TCP, IEC 61850 (GOOSE & MMS dual-network), IEC 104
<b>Certification</b>	
Standards	GB/T 34120, GB/T 34133

# 500 kW Energy Storage PCS

TPCS-500/0.69/3-LM



## Product Overview

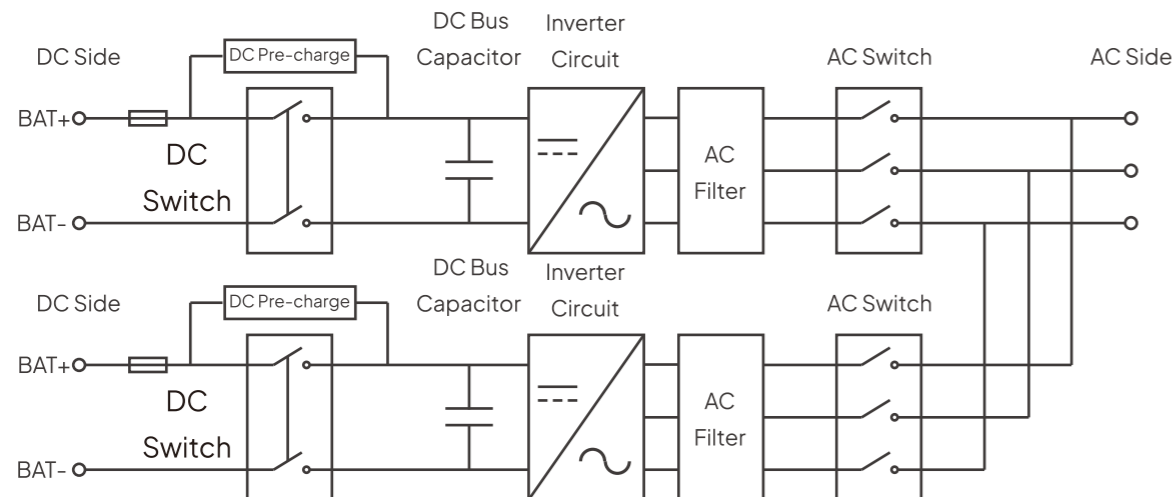
The TPCS-500/0.69/3-LM is a high-performance energy storage inverter featuring a dual-DC-input design, enabling flexible connection of two battery strings and significantly improving system configuration flexibility and battery availability. Its core advantages lie in its industry-leading high power density. Through optimized internal layout and heat dissipation design, the unit integrates high-power conversion modules within the cabinet, effectively reducing equipment footprint and saving installation space.

### High-efficiency conversion

- Three-level topology with peak efficiency up to 98.7%
- Wide DC voltage range, enabling full-load operation at 1500 V
- Dual battery cluster interfaces for higher battery availability

### Flexible applications

- Four-quadrant operation with advanced battery charge/discharge management
- Supports grid-forming, grid-following, and seamless online switching between the two modes



Model	TPCS-500/0.69/3-LM
<b>DC Side</b>	
DC Voltage Range	1050 ~ 1500V
Maximum DC Power	550kW
Maximum DC Current	262A×2
<b>AC Grid-connected Parameters</b>	
Rated AC Power	500kW
Maximum AC Power	550kW
Rated AC Current	418A
Maximum AC Current	460A
Rated Grid Voltage	690V
Maximum Overload Capacity	110% overload (continuous), 120% overload (1 min)
Allowable Grid Voltage Range	-12% to +10% (adjustable)
Grid Connection Type	3P + PE
Rated Grid Frequency	50Hz / 60Hz
Allowable Grid Frequency Range	45 ~ 50Hz / 60 ~ 65Hz
Adjustable Power Factor Range	-1 ~ +1
Isolation Transformer	Transformerless
THDi at Rated Power	<3% (at rated power)
<b>AC Off-grid Parameters</b>	
Rated AC Power	500kW
Rated Output Voltage	690V
Rated AC Current	418A
Rated Frequency	50Hz / 60Hz
THDv at Rated Power	<3% (at rated power)
<b>System</b>	
Isolation Method	Non-isolated
Maximum Efficiency	98.7%
Operating Ambient Temperature	-40 ~ +60
Cooling Method	Liquid cooling
IP Rating	Ip66
Relative Humidity	0~95% RH (non-condensing)
Maximum Operating Altitude	2000 m (linear derating to 70% from 2000 m to 4000 m)
Installation Method	Rack-mounted / Floor-standing
Dimensions (W x D x H)	790x1500x215mm
Weight	200kg
Communication Interface	RS485/ CAN/Ethernet
Communication Protocol	MODBUS-RTU / MODBUS-TCP / IEC61850(GOOSE, MMS dual-network) / IEC104
<b>Certification</b>	
Standards	UL1741, IEC61850, IEC/EN62477-1, EN50549-1, IEEE519, IEC/EN61000-6-2, IEC/EN61000-6-4, FCC Part 15