

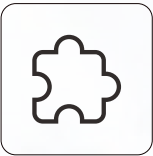
C&I BESS Solution



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Commercial and industrial energy storage is a typical application of the distributed energy storage system on the user side, and features close distance from the distributed pv power terminal and the load center, which can not only effectively improve the consumption rate of clean energy, but also effectively reduce the loss of power transmission, and help the realization of the carbon peaking and carbon neutrality goals. The purpose of industrial and commercial energy storage is to meet the electricity demand of industrial and commercial loads, and to realize the return on investment by making use of the difference between peak and valley electricity tariffs. C&i energy storage can cooperate with pv power generation to increase the ratio of "self-consumption priority", or it can take part in a microgrid system consisting of solar, wind, diesel generator, and other energy sources.



Flexible Configuration

Covering a wide power range of 30kW~MW,
Multiple configuration options for 2-5 hours backup power.



Convenient Installation

Integrated structure design with high protection grade
meeting a variety of application environments



Being Economical and Reliable

High charging and discharging efficiency
Design of an intelligent temperature control system
Providing a safer operating environment

Product Introduction and Features

Modular Power Conversion
System Design

Combined Battery System
Design, Supporting
Power Expansion

Supporting Redundant
Expansion for Multiple
Functions

Standard System Design
with Multiple Parallel
Operation



Modular PV
energy storage system



TRACK Outdoor
Liquid-cooled Battery Cabinets



Polar
C&I PV + BESS



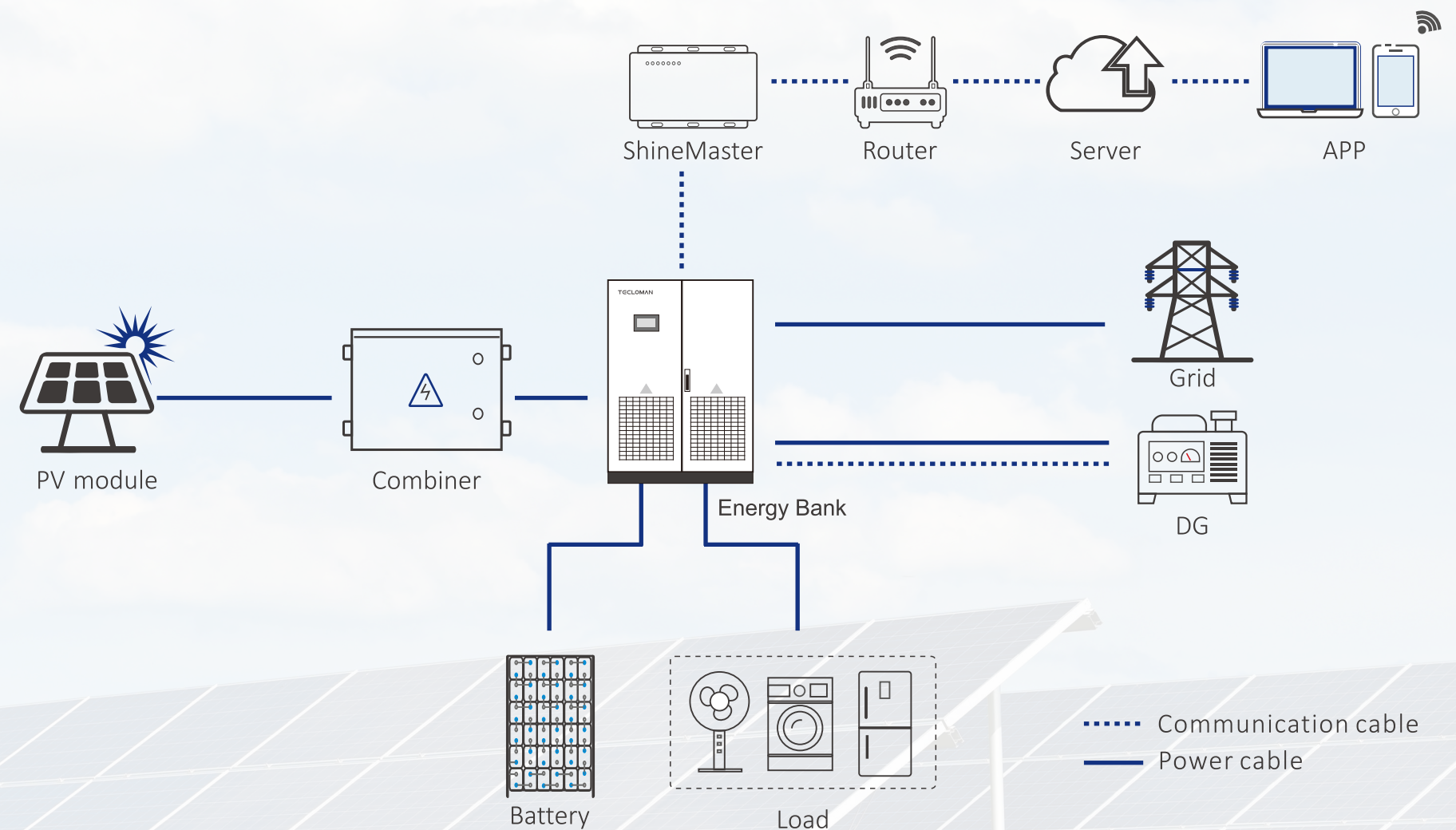
Vega
C&I PV + BESS(Container solution)

This commercial and industrial energy storage product operates under AC 400V on-grid condition, and can realize local manual adjustment, automatic peak shaving, dynamic expansion and other operating modes through local EMS or remote EMS control strategies.

The system can also be optionally equipped with a PV access function to form a PV-storage system.

PV Access

The System Connection Scheme is as Shown Below:



Flat and Valley Price Periods

In case of sufficient PV power generation, PVs first charge batteries and then supply the remaining power to loads; In case of insufficient PV power generation, PVs first charge batteries, and the grid supplies all the power to loads. However, the grid can charge batteries as well;

If batteries are not discharged within a week after the on-grid connection of the system, the batteries will be discharged a week following the charging to maintain the electrochemical activity, and the power is determined according to the battery calculation.

Peak Price Periods

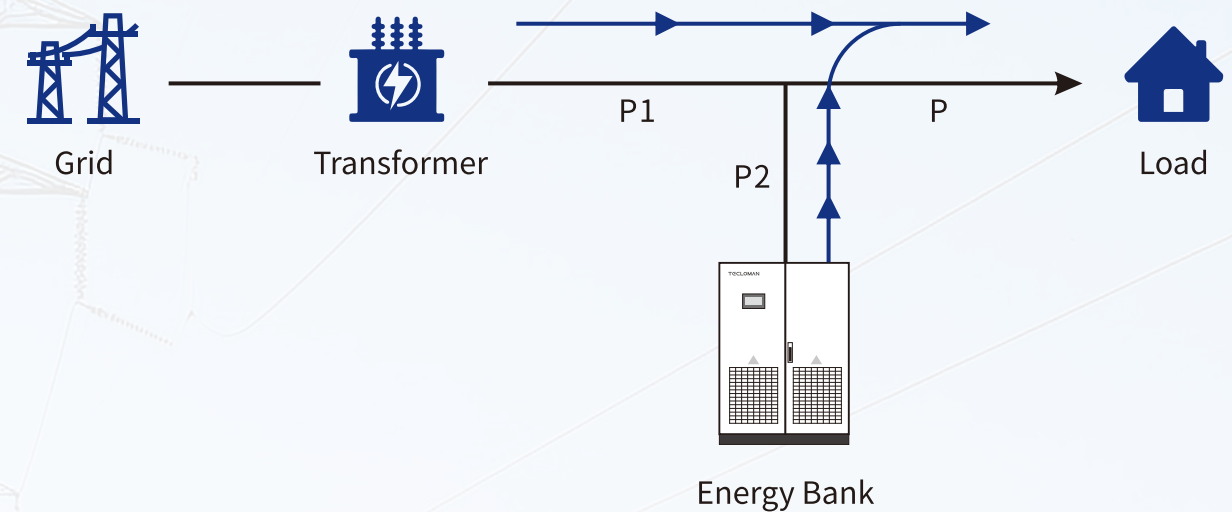
In case of sufficient PV power generation, PVs first supply power to loads and then charge batteries with the remaining power;

In case of insufficient PV power generation, batteries discharge to supply power to loads. If batteries get completely discharged, the grid supplies power to loads while charging batteries;

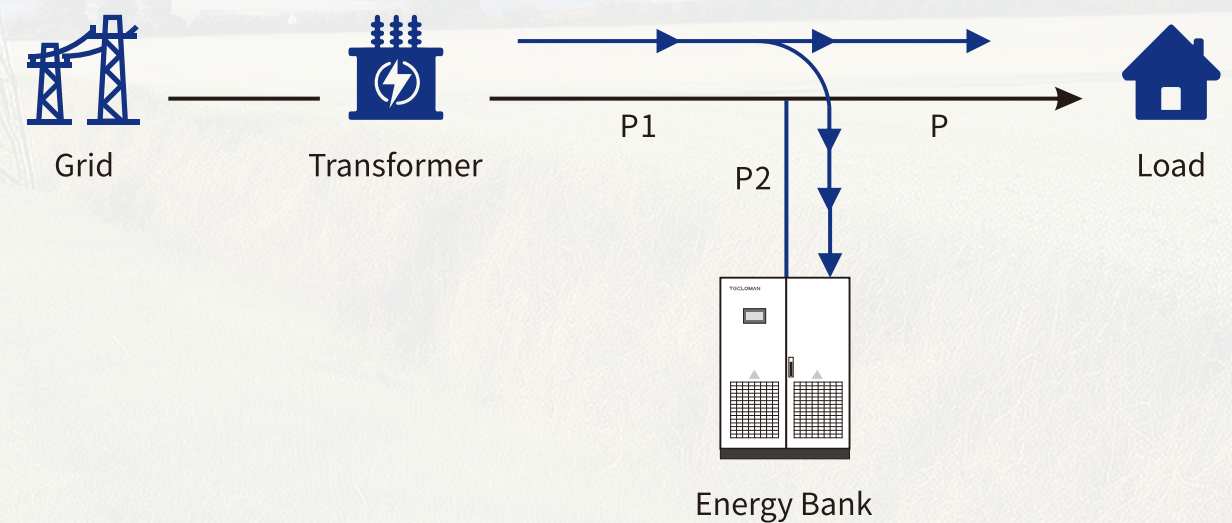
Dynamic extension of the grid or transformer by devices When electrical loads increase, the energy storage system can be used to effectively extend the capacity of the grid and reduce the short-time overload of transformers or circuits caused by the change of loads.

Dynamic Extension

When the power P of the load side is equal to or greater than that of the grid side, the energy storage system is in the discharging and extension mode ($P=P_1+P_2$) to reduce the load of transformers and effectively prevent the occurrence of the peak power.



When the power P of the load side is equal to or smaller than that of the grid side, the energy storage system is in the charging mode ($P_1=P+P_2$) to store the electric energy of the grid in batteries.

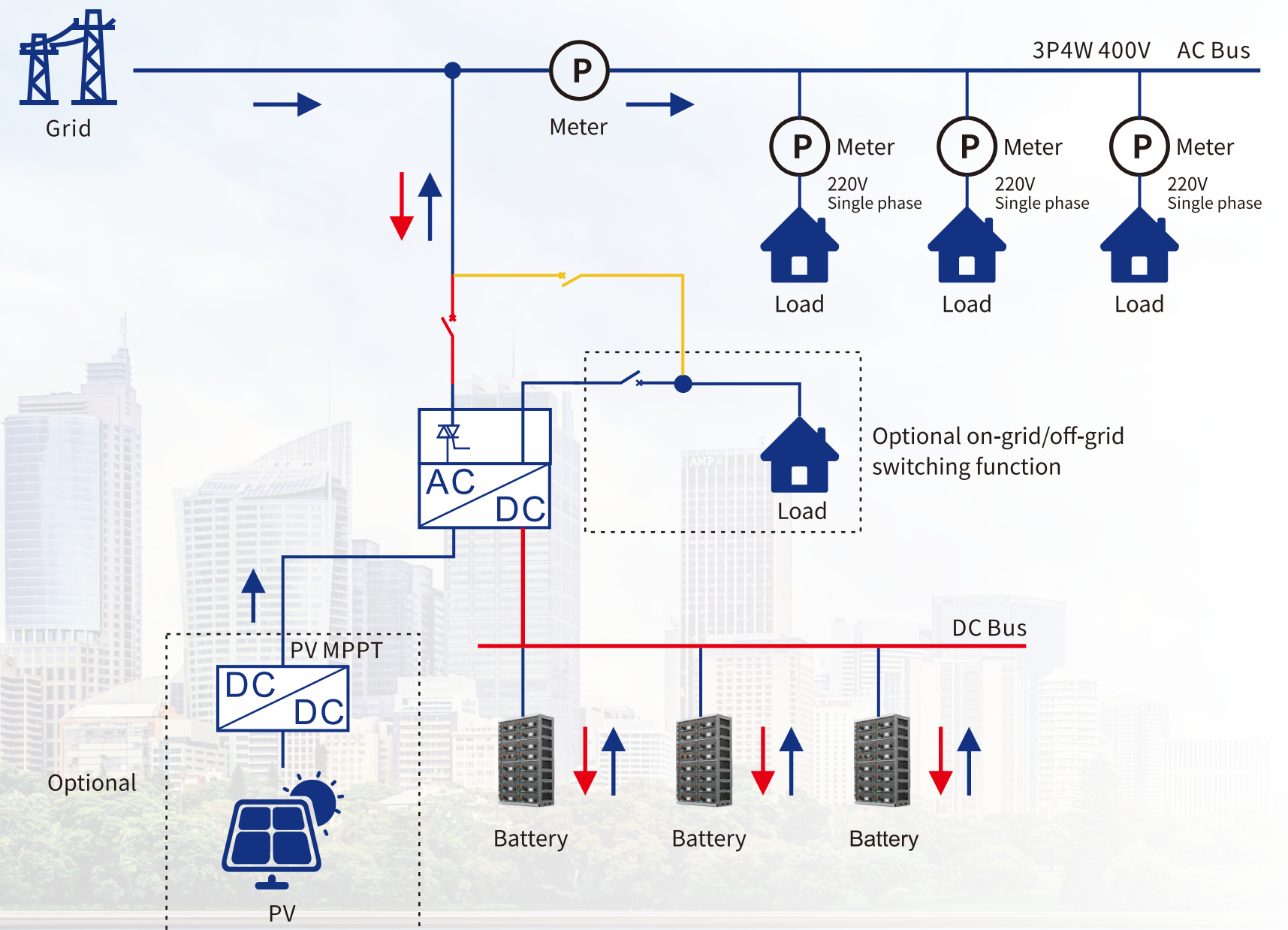


In power backup, power preservation, and other application scenarios, it is necessary to ensure the power supply for important loads. The EMS system controls the charging and discharging functions of batteries based on whether the grid is powered on or off, ensuring that its loads and power consumption terminal are not affected by grid outage. The switching time shall be less than or equal to 10ms.

① When the grid is powered on, the energy storage system works in on-grid mode and charges batteries under specific settings.

② When the grid is suddenly powered off, the distributed energy storage all-in-one machine inverts the battery energy storage into AC power supply for the loads, with a switching time less than 10ms, to ensure that the loads are not subject to intermittent power supply interruptions.

③ When the grid is powered on again, after the system detects the grid power-on, it automatically switches to the on-grid mode, and recharges the batteries according to the policy requirements to ensure the power supply for the next power outage.



On-grid/Off-grid Switching Function

- Matching Standard Modular PV-storage System
- Standard Single-gun and Dual-gun Ev Charger Access
- PV, Storage and Charging Control Strategy and Energy Scheduling
- Standard EV Charger System, Matching Combination Mode
- Prefabricated PV-storage-charging Integrated System



DC Power Supply of EV Charger

Modular PV energy storage system

THESS-120-241

THESS-125-261


THESS-240-482


THESS-250-522





Product Overview


The modular commercial and industrial energy storage system adopts a modular and integrated design. Independent battery cabinets and power cabinets enhance system safety and reliability. The equipment can integrate with photovoltaic (PV) systems to form a PV-storage hybrid system, increasing the self-consumption rate of solar energy. The system is adaptable to diverse Peak-valley arbitrage applications, including:Peak-valley arbitrage,Backup power supply.Smart microgrids,Dynamic capacity expansion for power supply stations,Renewable energy integration,Low-voltage mitigation and three-phase imbalance regulation in grid areas.

- 

Modular design, can be flexibly configured according to requirements;
- 

Independent battery and electrical space design enhances the level of protection;
- 

Supports seamless switching between grid-connected and off-grid operation, ensuring that critical loads operate without interruption.
- 

Support the access of photovoltaic power generation to improve the rate of self-consumption;
- 

Arbitrary standardized expansion, flexible and can be used in a variety of scenarios;

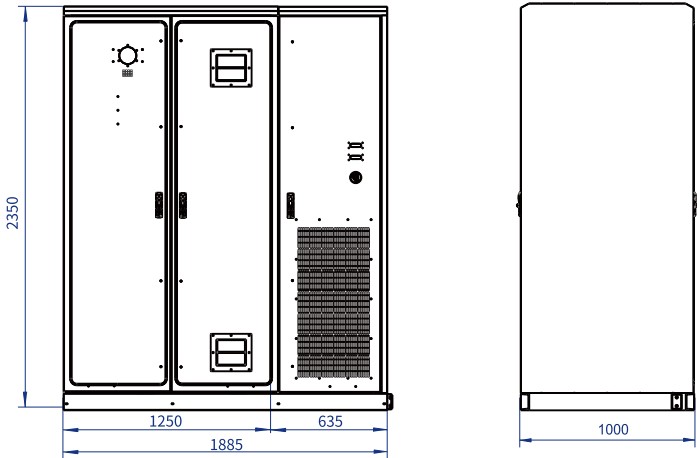
Modle	THESS-120-241	THESS-125-261	THESS-240-482	THESS-250-522
AC (Grid tied)				
Rated Power	120kW	125kW	240kW	250kW
Rated Voltage	400V			
Rated Current	173A	180A	346A	360A
Voltage Range	400Vac (-15%~+10%)			
Frequency	50Hz/60Hz			
THDI	<5%			
Power Factor	±1			
AC (Off-grid)				
Rated Power	120kW	125kW	240kW	250kW
Rated Voltage	400V			
Rated Current	173A	180A	346A	360A
THDU	<3%			
Frequency	50Hz/60Hz			
Overload Capability	110% 10minutes, 120% 1min			
DC (Battery and PV)				
Max. PV Open-circuit Voltage	1000V			
Rated PV Power	120kWp	120kWp	240kWp	240kWp
PV Voltage Range	400~650VDC	400~650VDC	400~650VDC	400~650VDC
PV MPPT NO.	2	2	4	4
Battery Rated Voltage	768V	832V	768V	832V
Battery Voltage Range	696~852VDC	728~949VDC	696~852VDC	728~949VDC
Battery Capacity	241kWh	261kWh	482kWh	522kWh
Max. Charge Power	120kW	125kW	240kW	250kW
Max. Discharge Power	120kW	125kW	240kW	250kW
Max. Charge Current	172A	171A	345A	343A
Max. Discharge Current	172A	171A	345A	343A

Modle	THESS-120-241	THESS-125-261	THESS-240-482	THESS-250-522
Basic Parameters				
On/off grid switch function	Optional			
On/off grid switch time	<20ms			
Noise Level	<75dB			
IP protection level	IP54			
Anti-corrosion protection	C3			
Operating Temperature	-20°C~50°C			
Fire protection	Aerosols			
Cooling	Forced air + Smart AC	Forced air + Liquid cooling	Forced air + Smart AC	Forced air + Liquid cooling
Relative Humidity	0 ~ 95%, without condensation			
Max. Altitude	< 2000m			
Dimensions (W×D×H)	1885×1300×2350mm	1635×1300×2350mm	3764×1300×2350mm	3264×1300×2350mm
Weight	3150kg	2990kg	6050kg	5700kg
Communication				
Display	Touch Screen			
Communication	RS485 / CAN / LAN			



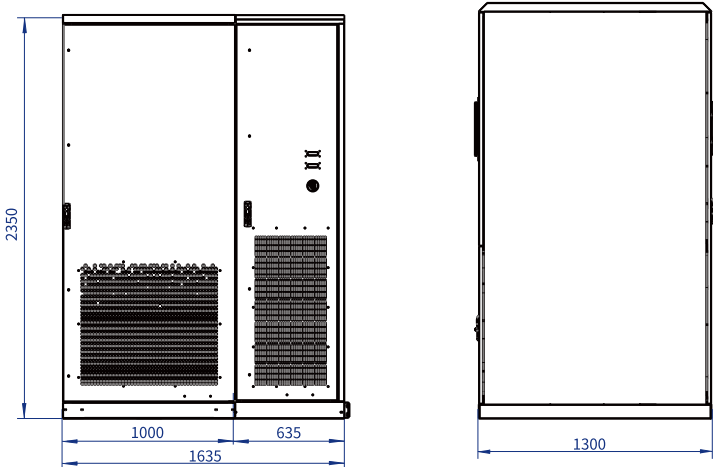
Product Dimensions

THESS-120-241 Dimensions: :1885mm×1300mm×2350mm Weight: 3150kg

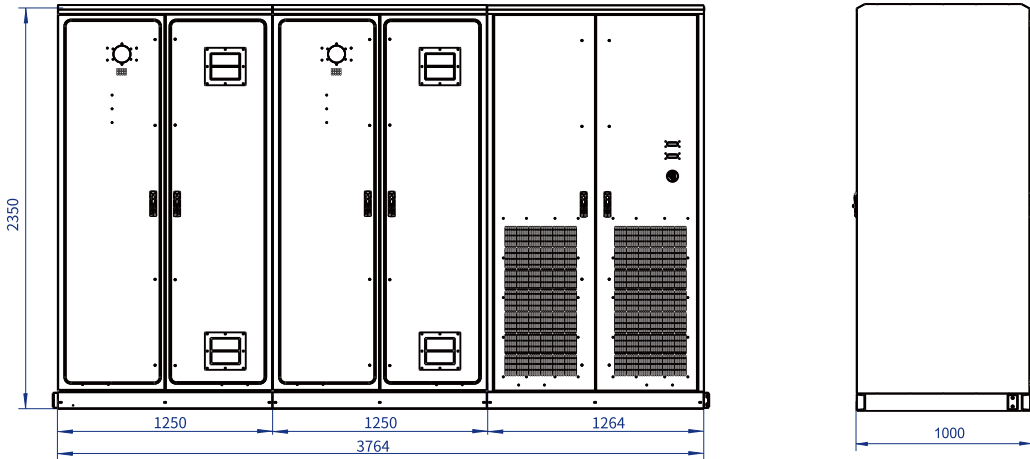


Product Dimensions

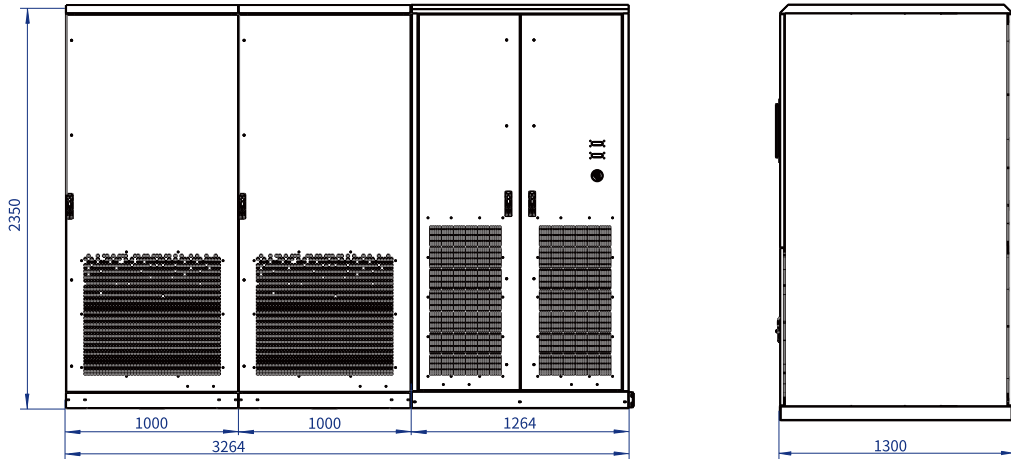
THESS-125-261 Dimensions: 1435mm×1300mm×2350mm Weight: 2900kg



THESS-240-482 Dimensions: 3764mm×1300mm×2350mm Weight: 6050kg



THESS-120-241 Dimensions: 3264mm×1300mm×2350mm Weight: 5700kg



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

Polar

C&I PV + BESS

- THESS-30-114/129/143/157
- THESS-60-114/129/143/157
- THESS-90-258/286/315
- THESS-120-286/315
- THESS-150-315/387/430/473



Product Overview

Polar is mainly aimed at the scenarios of commercial & industrial battery storage applications. The system integrates photovoltaic solar and battery storage technologies to improve the spontaneous self-consumption rate of solar generation, reduce abandoned solar. The system has both indoor and outdoor designs to meet different installation environments, and its power and energy capacity can be flexibly configured according to needs. The system adopts modular PCS and MPPT to improve the maintenance and redundancy of the system.

- Modular design, can be flexibly configured according to requirements.
- Independent battery and electrical space design enhances the level of protection.
- Arbitrary standardized expansion, flexible and can be used in a variety of scenarios.
- Professional cloud platform monitoring, multi-dimensional after-sales service system.
- Support the access of photovoltaic power generation to improve the rate of self-consumption.
- PCS Certifications: EN IEC 61000-6-2:2019、EN IEC 61000-6-4:2019、IEC 62477-1:2012/AMD1:2016、EN 62477-1:2012/A1:2017、VDE-AR-N 4105:2018-11、DIN VDE V 0124-100(VDE V 0124-100):2020-06、EN 50549-1: 2019;
Module Certifications:GB/T36276-2018、IEC61629、UN38.3、EMC;
Battery Certifications:UL1973、UL9540A、IEC61629、UN38.3、GB/T36276-2018、ROHS、MSDS.

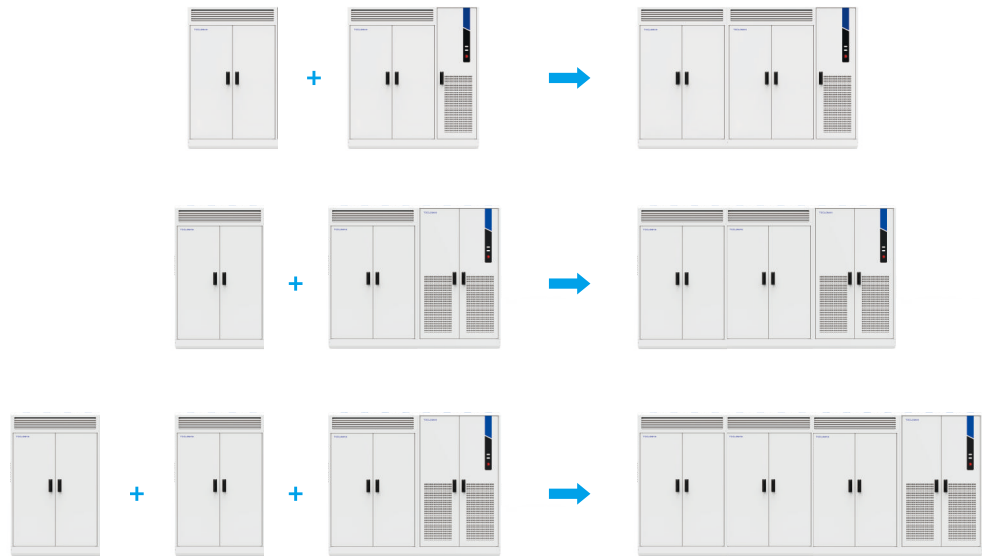
Model	THESS-30-114	THESS-60-114	THESS-90-258	THESS-120-286	THESS-150-315
	THESS-30-129	THESS-60-129	THESS-90-286	THESS-120-315	THESS-150-387
	THESS-30-143	THESS-60-143	THESS-90-315		THESS-150-430
	THESS-30-157	THESS-60-157			THESS-150-473
AC (Grid tied)					
Apparent Power	33kVA	66kVA	100kVA	132kVA	165kVA
Rated Power	30kW	60kW	90kW	120kW	150kW
Rated Voltage	400V				
Rated Current	43A	87A	130A	173A	217A
Voltage Range	360V ~ 440V				
Frequency	50/60Hz				
THDI	<3%				
Power Factor	-0.9 leading ~ 0.9 lagging				
Wire Connection	3 / N / PE				
AC input	33kVA	66kVA	100kVA	132kVA	165kVA
AC (Off-grid)					
Apparent Power	33kVA	66kVA	100kVA	132kVA	165kVA
Rated Power	30kW	60kW	90kW	120kW	150kW
Rated Voltage	400V				
Rated Current	43A	87A	130A	173A	217A
THDU	≤2%				
Frequency	50/60Hz				
Overload Capability	110% for long-term; 120% for 1min				
DC (Battery and PV)					
Max. PV Open-circuit Voltage	1000V DC				
Rated PV Power	30kWp	60kWp	90kWp	120kWp	150kWp
Max. PV Power	1.1~1.4 times rated				
PV Voltage Range	400~750V DC	400~750V DC	400~750V DC	500~750V DC	500~750V DC
Max. PV Current	100A	200A	200A×2	200A×2	200A×3
PV MPPT NO.	1	1/2	2/3	2/4	3/5
Battery Voltage Range	352V ~ 600V				
Available Battery Capacity	114.69kWh 129.02kWh 143.36kWh 157.70kWh	114.69kWh 129.02kWh 143.36kWh 157.70kWh	258.05kWh 286.72kWh 315.39kWh	286.72kWh 315.39kWh	315.00kWh 387.07kWh 430.08kWh 473.09kWh
(三种规格电池容量可任意配置。)					
Max. Charge Power	33kW	66kW	100kW	132kW	165kW
Max. Discharge Power	33kW	66kW	100kW	132kW	165kW
Max. Charge Current	100A	154A	300A	308A	462A
Max. Discharge Current	100A	154A	300A	308A	462A

Model	THESS-30-114	THESS-60-114	THESS-90-258	THESS-120-286	THESS-150-315
	THESS-30-129	THESS-60-129	THESS-90-286	THESS-120-315	THESS-150-387
	THESS-30-143	THESS-60-143	THESS-90-315		THESS-150-430
	THESS-30-157	THESS-60-157			THESS-150-473

Basic Parameters					
On/off grid switch function	Assorting				
On/off grid switch time	≤10ms				
Noise Level	<75dB(A)@1m				
IP protection level	IP54				
Fire protection	Aerosols				
Operating Temperature	-25°C ~ +55°C				
Protection Function	Over /under voltage, Over current, Over/low temperature, SOC too high/low Low insulation impedance, Short circuit protection, etc				
Cooling	Forced air + Smart AC				
Relative Humidity	0 ~ 95%, without condensation				
Max. Altitude	≤3000m (>3000m derating)				
Dimensions (W×D×H)	1985×1000×2190mm		3964×1000×2190mm		5314×1000×2190mm
Weight	1948kg	1978kg	3858kg	4320kg	4572kg
	2059kg	2089kg	4060kg	4542kg	5847kg
	2170kg	2200kg	4282kg		6180kg
	2281kg	2311kg			6513kg
Communication					
HMI	Touch Screen				
Communication	RS485 / CAN / LAN				

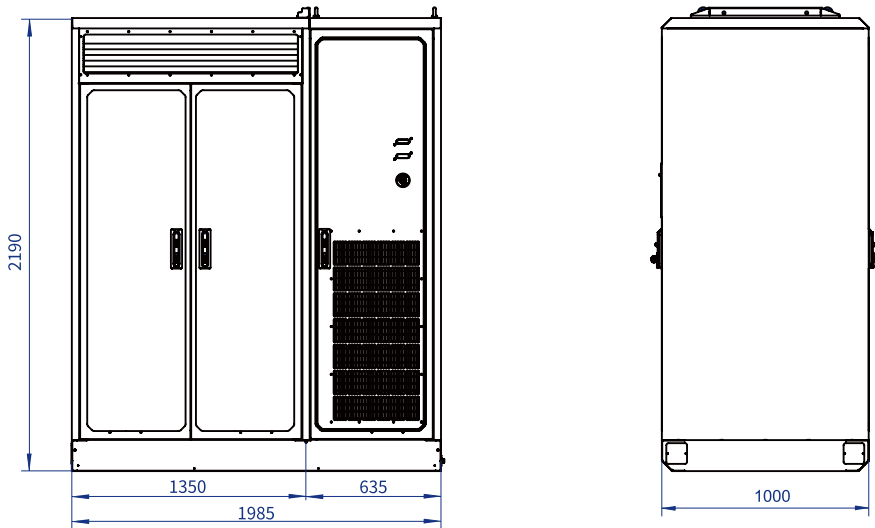
Note: * Battery energy capacity can be added multiply.
* The system supports inverter parallel operation, please contact manufacturer for details.

Combination Parallel

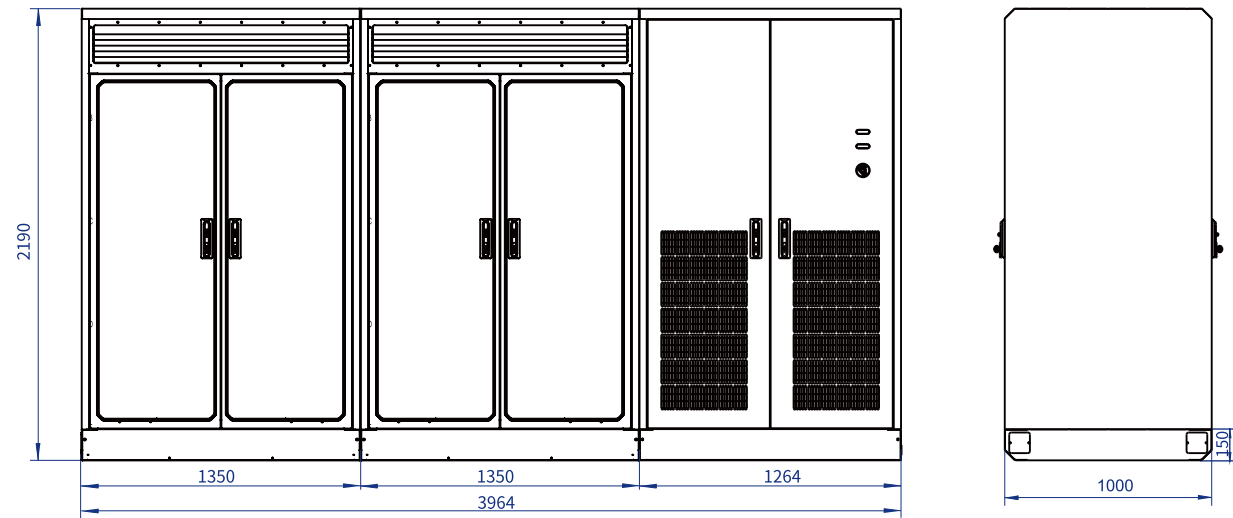


Product Dimensions

THESS-30-114:



THESS-150-315:



Vega

C&I PV + BESS(Container solution)

- THESS-500-1003
- THESS-630-1290
- THESS-1000-2007
- THESS-1260-2150



Product Overview

Vega is mainly aimed at the use of commercial energy storage application scenarios in both domestic and overseas market. The system integrates PV and energy storage technology to improve the self-utilization rate of PV, reduce PV power waste and direct grid-connection of PV. Integrated with standard 20-foot and 40-foot containers, fire extinguishing and intelligent temperature control systems with high safety protection levels are suitable for various PV energy storage and charging scenarios.

- Integrated design, high protection level, convenient installation and transportation;
- Independent battery and electrical space design enhances the level of protection;
- The reliable integration of intelligent temperature control and fire management improves the fire safety protection of the system;
- Meet the renewable energy storage, micro grid, peak regulation and other multiple application scenarios;
- Support the access of photovoltaic power generation to improve the rate of self-consumption;
- The whole container is certified by Classification Society to meet the overall transportation of the system.

Model	THESS-500-1003	THESS-630-1290	THESS-1000-2007	THESS-1260-2150
AC (Grid tied)				
Apparent Power	550kVA	693kVA	1100kVA	1280kVA
Rated Power	500kW	630kW	1000kW	1200kW
Rated Voltage	400V			
Rated Current	722A	909A	1444A	1563A
Voltage Range	360V ~ 440V			
Frequency	50/60Hz			
THDI	<3%			
Power Factor	- 0.9 leading ~ 0.9 lagging			
Wire Connection	3 / N / PE			
AC input	550kVA	693kVA	1100kVA	1280kVA
AC (Off-grid)				
Apparent Power	550kVA	693kVA	1100kVA	1280kVA
Rated Power	500kW	630kW	1000kW	1200kW
Rated Voltage	400V			
Rated Current	722A	909A	1444A	1563A
THDU	≤2%			
Frequency	50/60Hz			
Overload Capability	110% for long-term; 120% for 1min			
DC (Battery and PV)				
Max. PV Open-circuit Voltage	1000V DC			
Rated PV Power	500kWp	600kWp	1000kWp	1000kWp
Max. PV Power	1.1~1.4 times rated			
PV Voltage Range	400V ~ 600V DC			
Max. PV Current	100A×10	100A×12	100A×20	100A×20
PV MPPT NO.	10	12	20	20
Battery Voltage Range	627V ~ 850V			
Available Battery Capacity	1003.52kWh 1505.28kWh 2007.04kWh	1290.24kWh 1935.36kWh	2007.04kWh	2150.4kWh
Max. Charge Power	500kW	630kW	1000kW	1200kW
Max. Discharge Power	500kW	630kW	1000kW	1200kW
Max. Charge Current	722A	909A	1444A	1540A
Max. Discharge Curretn	722A	909A	1444A	1540A

Model	THESS-500-1003	THESS-630-1290	THESS-1000-2007	THESS-1260-2150
Basic Parameters				
Noise Level	<65dB (A) @1m			
IP protection level	IP54			
Fire protection	C6F12O fire extinguisher			
Operating Temperature	-25°C ~ +55°C			
Protection Function	Over /under voltage, Over current, Over/low temperature, SOC too high/low Low insulation impedance, Short circuit protection, etc			
Cooling	Forced air + Smart AC			
Relative Humidity	0 ~ 95%, non-condensing			
Max. Altitude	4000m (>2000m derating capacity)			
Dimensions (W×D×H)	6058×2438×2896mm		12192×2438×2896mm	
Weight	25T (20 feet)		38T (40 feet)	
Build-in Transformer	Optional			
Communication				
HMI	Touch Screen			
Communication	RS485 / CAN / LAN			

Certifications

PCS Certifications:

CE、EN 61000-6-4:2019、EN 61000-6-2:2019、EN 62477-1:2012+A1:2017、EN62109-1:2010、EN 50549-1: 2019、C10/11.

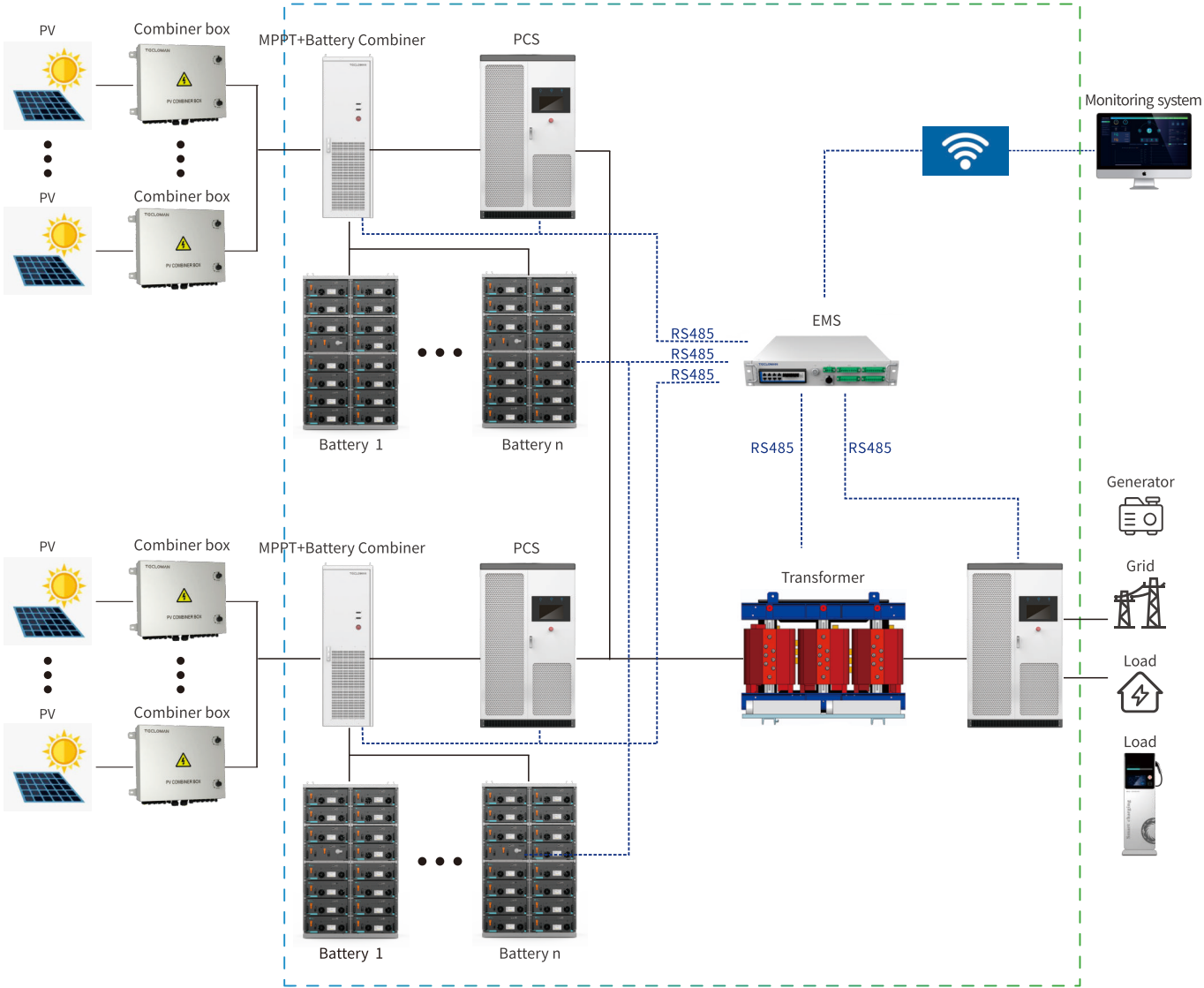
Module Certifications:

GB/T36276-2018、IEC61629、UN38.3、EMC.

Battery Certifications:

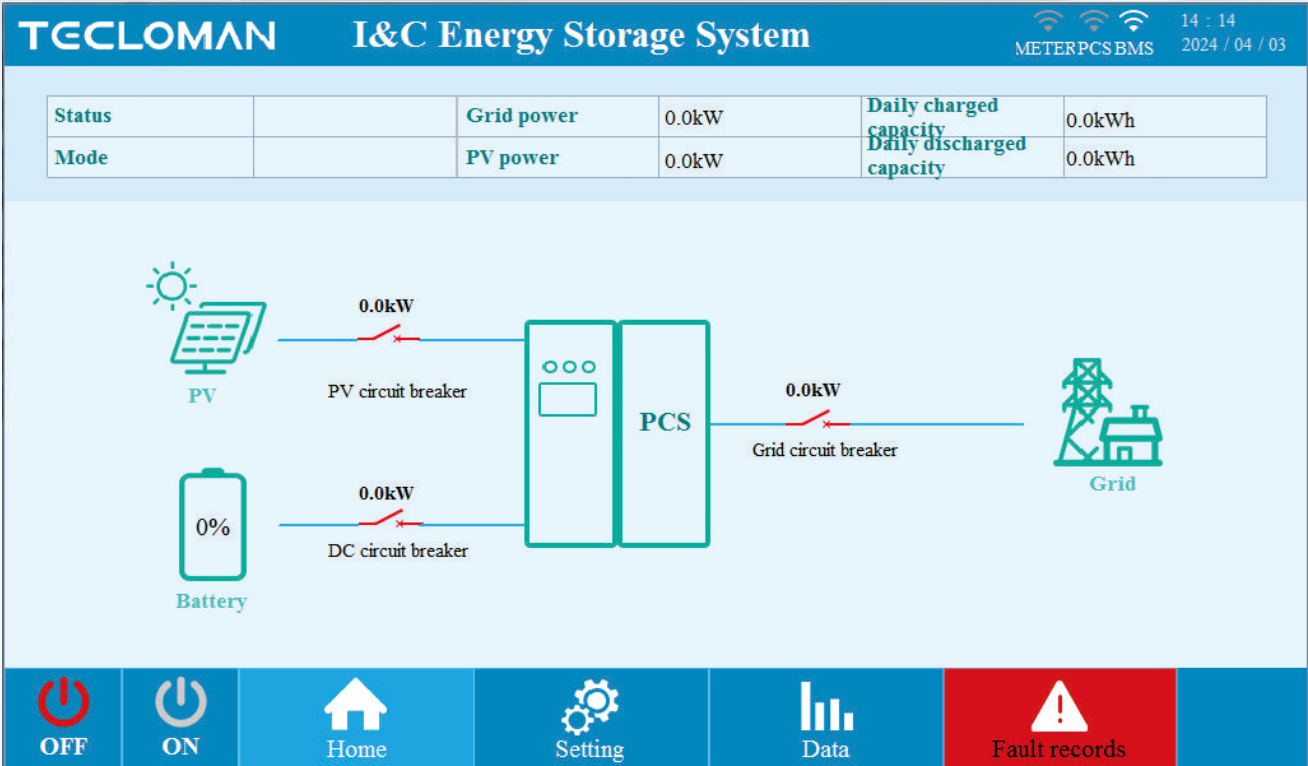
UL1973、UL9540A、IEC61629、UN38.3、GB/T36276-2018、ROHS、MSDS.

Product Principle



* Remarks:

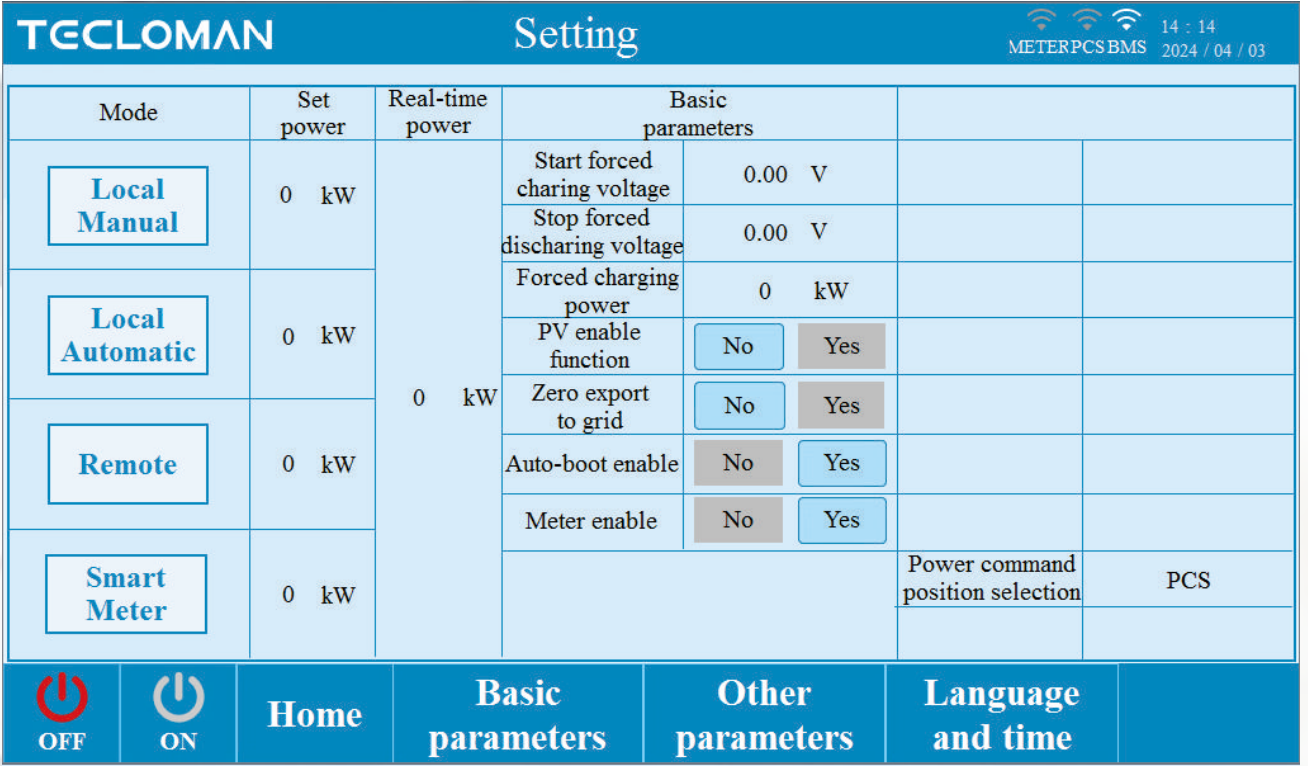
1. This system adopts standard container integration, container size is standard 20 feet or 40 feet.
2. 40-foot standard containers are used for systems with battery power over 1000kWh, and 20-foot standard containers are used for systems with battery power below 1000kWh.
3. 20-foot container dimensions: W×D×H = 6058×2438×2896mm.
40-foot container dimensions: W×D×H = 12192×2438×2896mm.



Monitoring Home Page

- The local EMS control of commercial and industrial energy storage adopts a unified operating interface, which is convenient for customer operation and maintenance;
- Realize the monitoring function of PCS, BMS, and auxiliary systems;
- It can realize the power monitoring of the grid side or the load side, understand the relevant data in real time and participate in the control;
- Reserve RS485 and Ethernet interfaces;

Local EMS Control



Multiple Operating Modes

- Four operating modes are available for free choice to meet a variety of application requirements;
- Local automatic: Implement automatic operation strategy during local peak and valley periods;
- Remote EMS: Execute device operation according to superior control commands and support RS485 or Ethernet port;
- Dynamic extension: A single local device is provided with the function of dynamic extension to meet the requirements of independent operation.

Centralized EMS controller is a cost-effective and multi-functional energy management controller tailored for the energy storage industry. By collecting important data between devices, processing and analyzing the data, and implementing internal control strategies within the controller, various application scenarios can be achieved, such as peak shaving and frequency regulation, peak-valley arbitrage, and reducing maximum demand. At the same time, the EMS controller can manage 7 energy storage devices simultaneously, supervise the operation of each device in real time, and allocate the operating power among the devices reasonably.



Parallel Operation Management
Can manage the operation of 7 devices simultaneously, and allocate the operating power of each device reasonably.



System Protection
Integrated structure design with high protection grade meeting a variety of application environments.



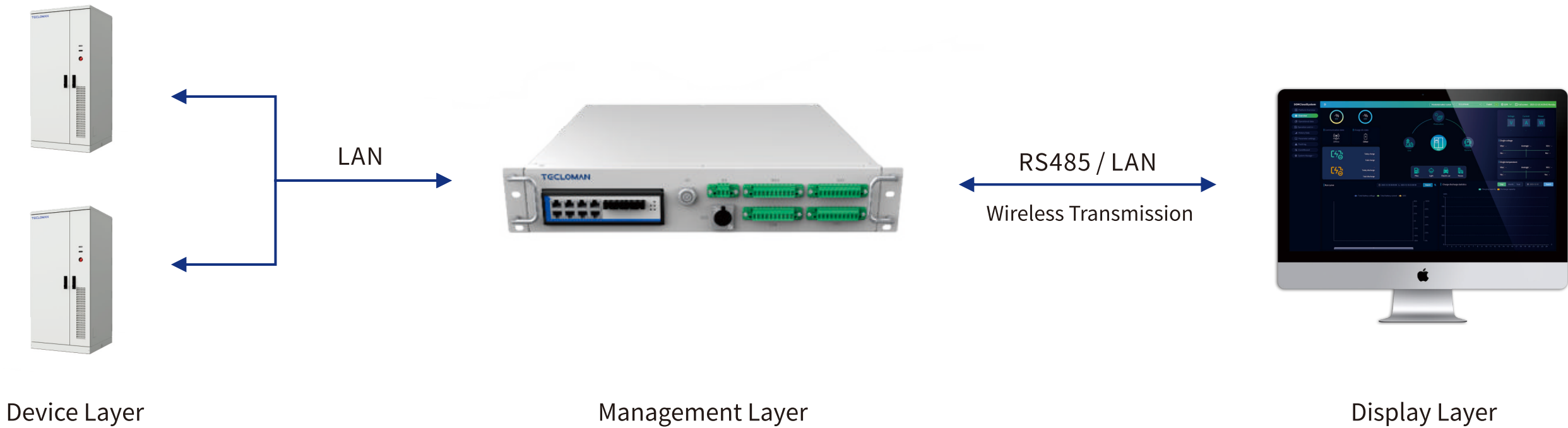
Fault Alarm
Collect fault alarms among devices, including time, level, status, etc.



Energy Management
Configure energy storage strategies, including manual mode, local automatic, remote EMS and dynamic extension, etc., to adapt to various scenario requirements.



Device Monitoring
View the operation status of various devices in the energy storage system and support device regulation.







Centralized/Remote EMS Control

Tecloman Smart O&M Cloud System is a professional remote operation and maintenance monitoring platform independently developed for energy storage products, which adopts self-developed edge computing terminals for bi-directional data communication, and encrypts and decrypts the transmitted data through encryption algorithms to ensure the security of communication.

Users can view the equipment operation status, alarm records, historical data and other information at any time through browser, applet or APP, and can also perform remote parameter setting, control, timing, firmware upgrading and other operations on the equipment, realizing the monitoring and operation and maintenance of the whole life cycle of the equipment.

Tecloman Smart O&M Cloud System

-  Full-time data monitoring + beidou positioning, Remote visualization of equipment status and location
-  Intelligent operation strategy, can be customized Strategy, to achieve automatic control of equipment
-  Intelligent O&M, intelligent equipment health status Assessment based on historical data
-  Fault alarm information active push, support public, Sms,email multiple message reminder function