

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

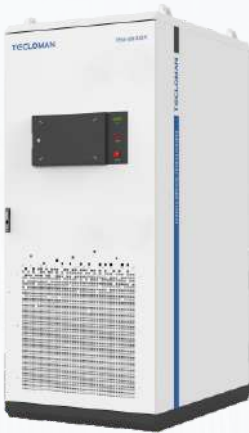
Combined Battery System
Design, Supporting
Power Expansion

Supporting Redundant
Expansion for Multiple
Functions

Standard System Design
with Multiple Parallel
Operation



Eos
C&I BESS



Alcor
Liquid cooling BESS for C&I



Polar
C&I PV + BESS



Vega
C&I PV + BESS(Container solution)

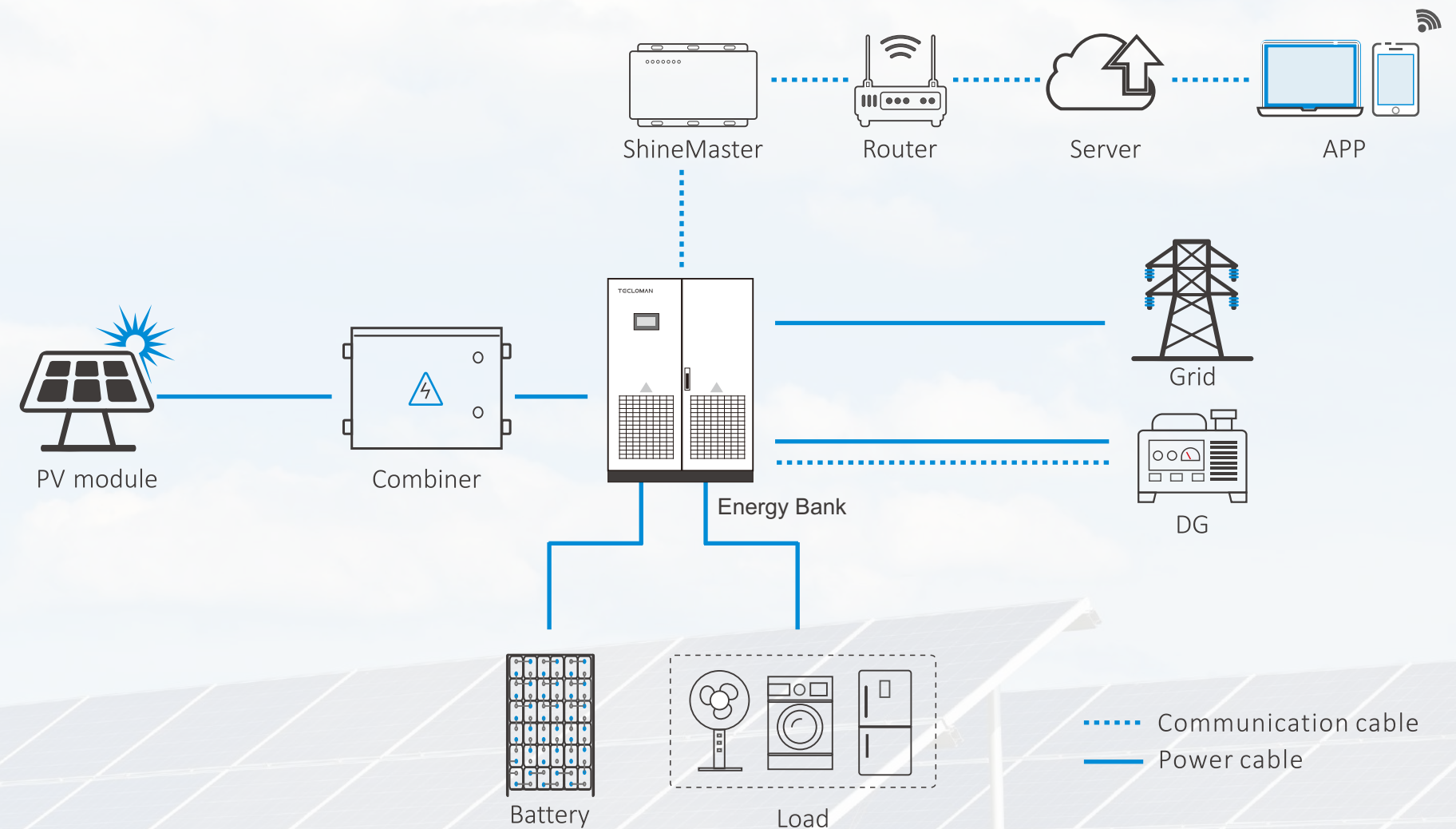


This commercial and industrial energy storage product operates under AC 400V on-grid condition, and can realize local manual adjustment, automatic peak shaving, dynamic expansion and other operating modes through local EMS or remote EMS control strategies.

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

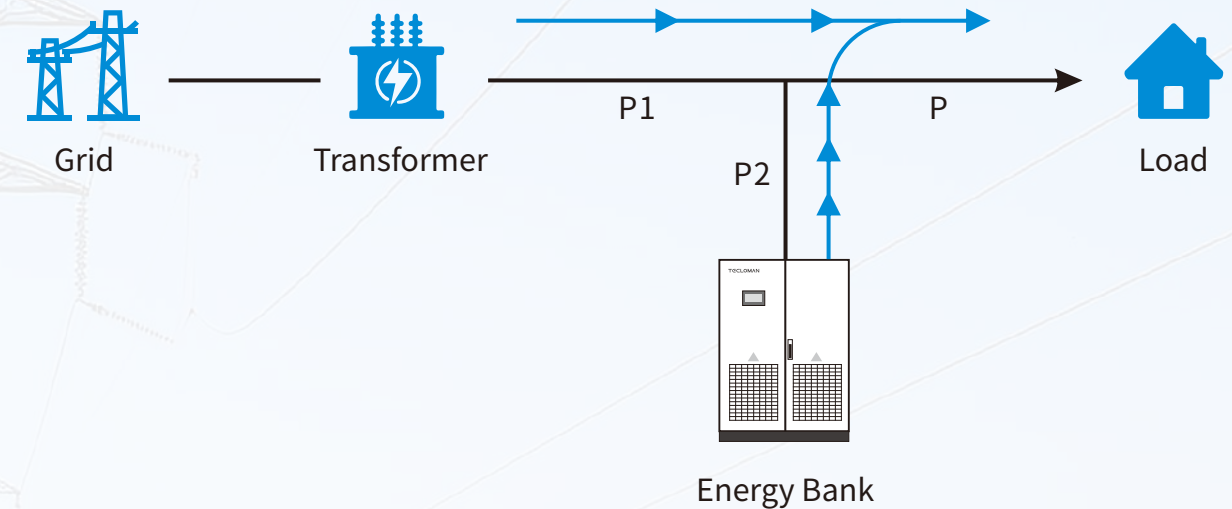
In case of sufficient PV power generation, PVs first supply power to loads and then charge batteries with the remaining power;

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;

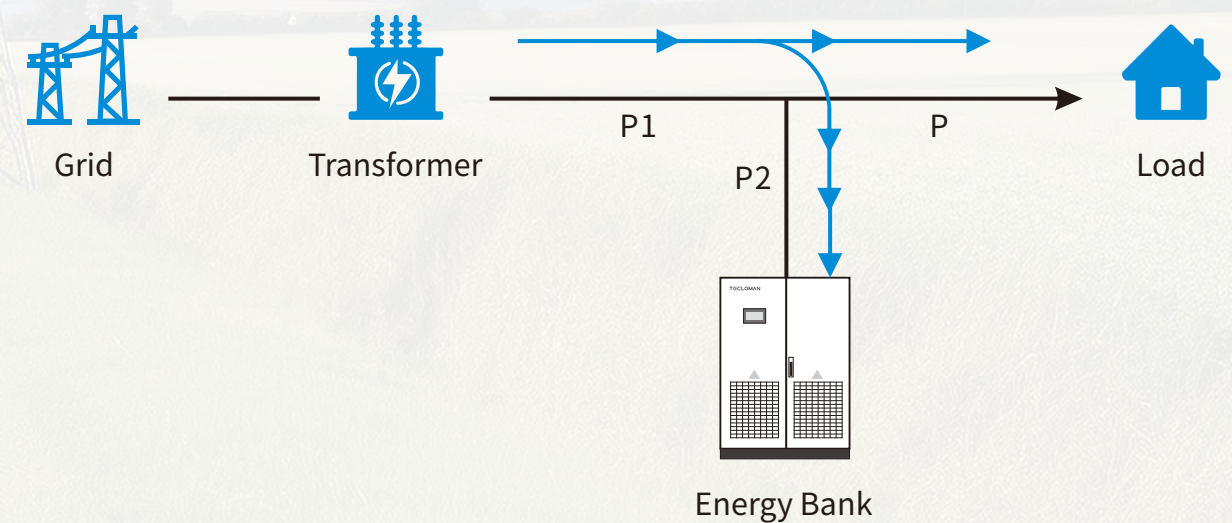
Dynamic extension of the grid or transformer by devices When electrical loads increase, the energy storage system can be used to effectively extend the capacity of the grid and reduce the short-time overload of transformers or circuits caused by the change of loads.

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.

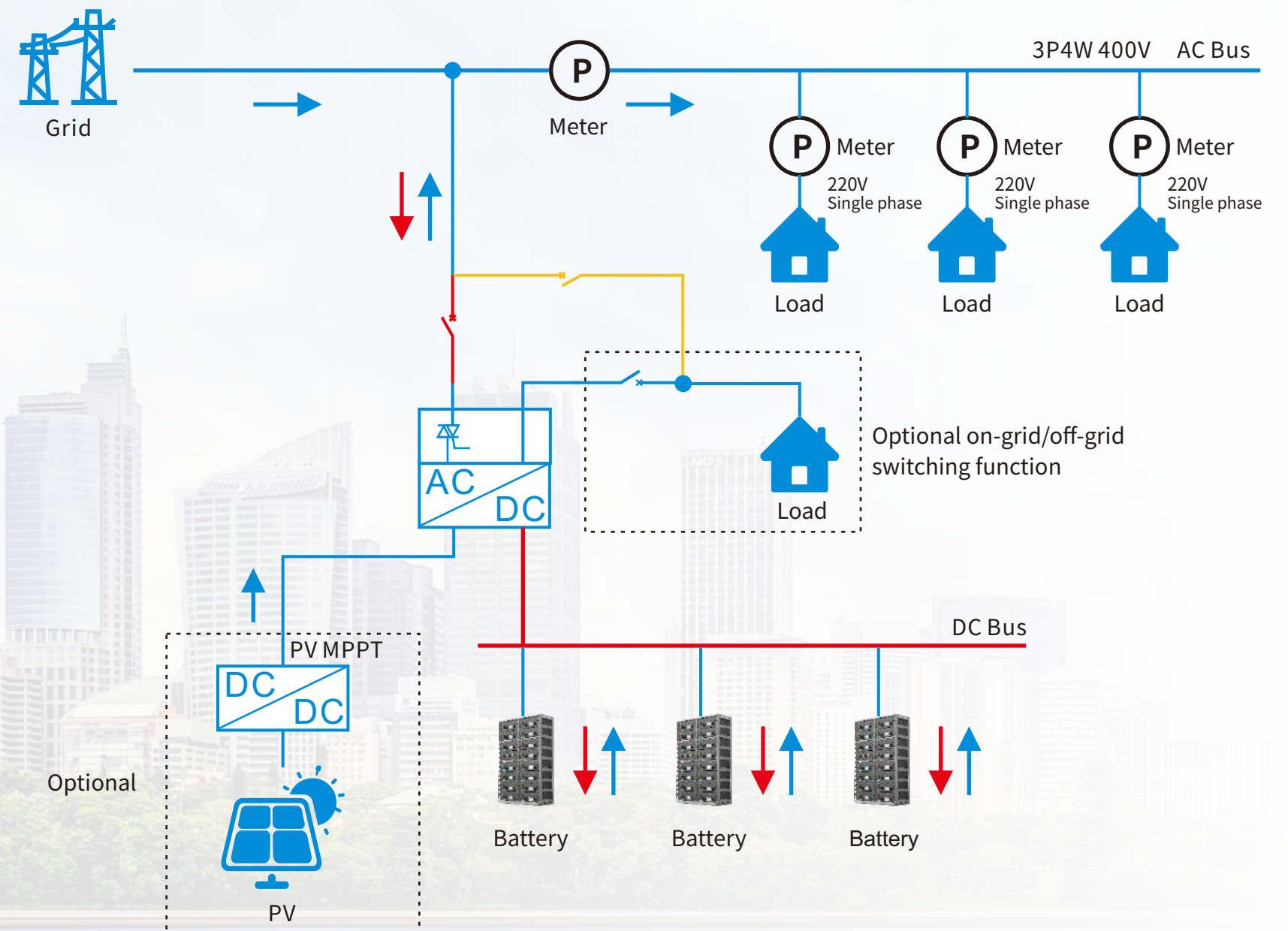


In power backup, power preservation, and other application scenarios, it is necessary to ensure the power supply for important loads. The EMS system controls the charging and discharging functions of batteries based on whether the grid is powered on or off, ensuring that its loads and power consumption 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

Eos
C&I BESS

- TESS-30-100
- TESS-50-100
- TESS-100-215



Product Overview

In the Eos commercial energy storage system, long-life battery cells, new BMS control methods, high-performance PCS, intelligent temperature control system, and active fire control system are integrated into the standardized outdoor cabinets. Eos is designed with the concept of completely independent electrical and battery components spaces, to enhance the reliability of system temperature control and fire safety protection. The product is applied in various application scenarios, such as peak shaving, renewable energy storage, dynamic expansion, and low voltage supporting of power grid.

- Integrated structure design with high protection level, to meet the installation and use in different environments.
- The design with independent battery and electrical spaces, to enhance fire safety and reliability of the system.
- Built-in local/remote EMS control logic, to meet the operation strategy customization of local operation and remote scheduling.
- Professional multi-platform access, to provide multi-dimensional after-sales and operation & maintenance services.
- 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.

Medel	TESS-30-100	TESS-50-100	TESS-100-215
AC (Grid tied)			
Apparent Power	33kVA	55kVA	110kVA
Rated Power	30kW	50kW	100kW
Rated Voltage	400V		
Rated Current	43A	72A	144A
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	55kVA	110kVA
AC (Off-grid)			
Apparent Power	33kVA	55kVA	110kVA
Rated Power	30kW	50kW	100kW
Rated Voltage	400V		
Rated Current	43A	72A	144A
THDU	≤2%		
Frequency	50/60Hz		
Overload Capability	110% for long-term; 120% for 1min		
DC (Battery and PV)(PV-Optional)			
Max. PV Open-circuit Voltage	1000V DC		
Rated PV Power	30kWp	50kWp	100kWp
Max. PV Power	1.1~1.4 times rated		
PV Voltage Range	400 ~ 750V DC	400 ~ 750V DC	400 ~ 650V DC
Max. PV Current	60A	60A×2	100A×2
PV MPPT NO.	1	2	2
Battery Voltage Range	313V ~ 403V	313V ~ 403V	672V ~ 884V
Available Battery Capacity	100.35kWh	100.35kWh	215.04kWh
Max. Charge Power	30kW	50kW	100kW
Max. Discharge Power	30kW	50kW	100kW
Max. Charge Current	95A	154A	148A
Max. Discharge Current	95A	154A	148A

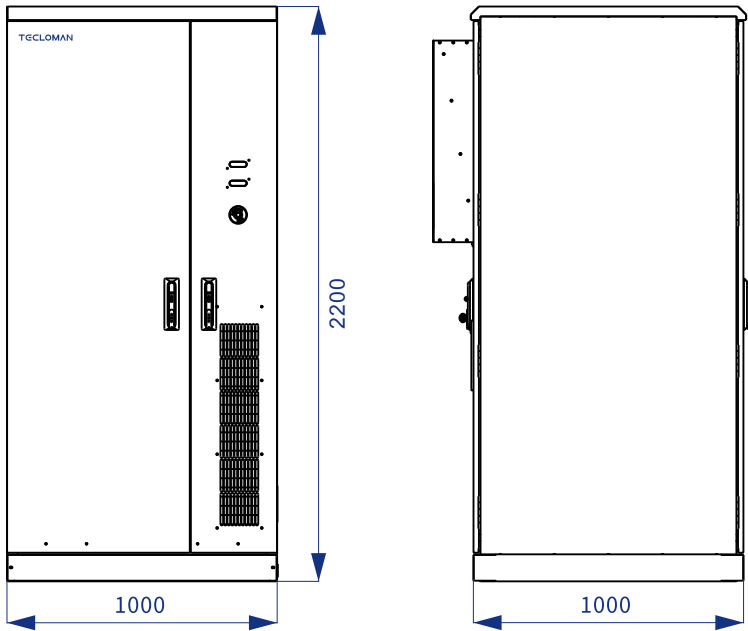
Model	TESS-30-100	TESS-50-100	TESS-100-215
Basic Parameters			
On/off grid switch function	Assorting		
On/off grid switch time	≤10ms		
Noise Level	<65dB(A)@1m		
IP protection level	IP54		
Fire protection	Aerosols		
Operating Temperature	-25°C ~ +55°C		
Protection Function	Over /under voltage, Over current, 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	4000m (>2000m derating)		
Dimensions (W×D×H)	1000×1000×2200mm	1000×1000×2200mm	1545×1000×2350mm
Weight	1350kg	1380kg	2450kg
Communication			
HMI	Touch Screen		
Communication	RS485 / LAN		



Product Dimensions

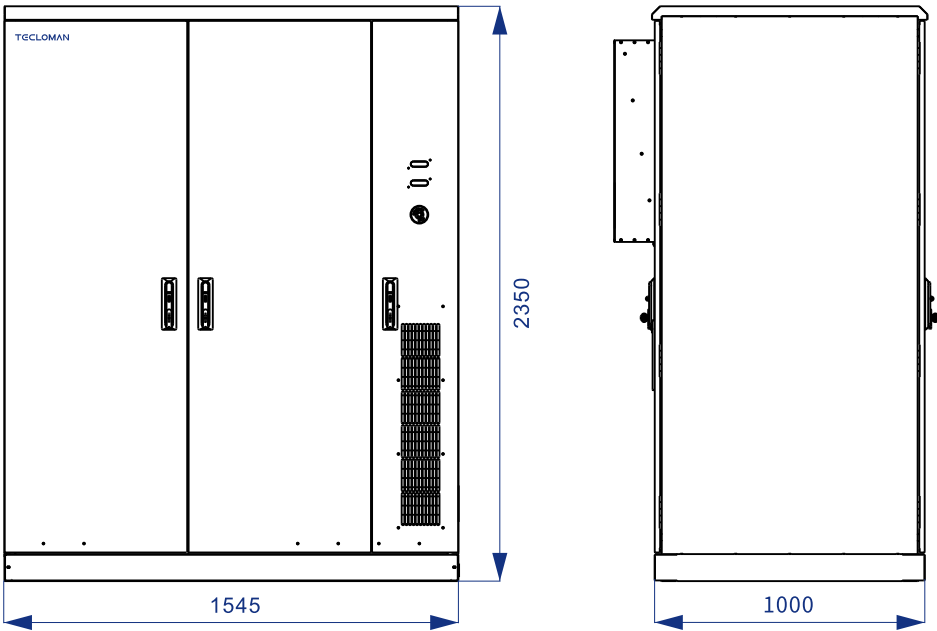
Energy Bank TESS-30-100 / TESS-50-100:

Dimensions: 1000mm×1000mm×2200mm Weight: 1350kg/1380kg



Energy Bank TESS-100-215 / TESS-120-215:

Dimensions: 1545mm×1000mm×2350mm Weight: 2450kg



Alcor

Liquid cooling BESS for C&I

- TESS-100-233-Y
- TESS-120-233-Y
- TESS-240-233-Y



Product Overview

The Alcor liquid cooling energy storage system, long-life battery cells, new BMS control methods, high-performance PCS, intelligent temperature control system, and active fire control system are integrated into the standardized outdoor cabinets. Eos is designed with the concept of completely independent electrical and battery components spaces, to enhance the reliability of system temperature control and fire safety protection. The product is applied in various application scenarios, such as peak shaving, renewable energy storage, dynamic expansion, and low voltage supporting of power grid.

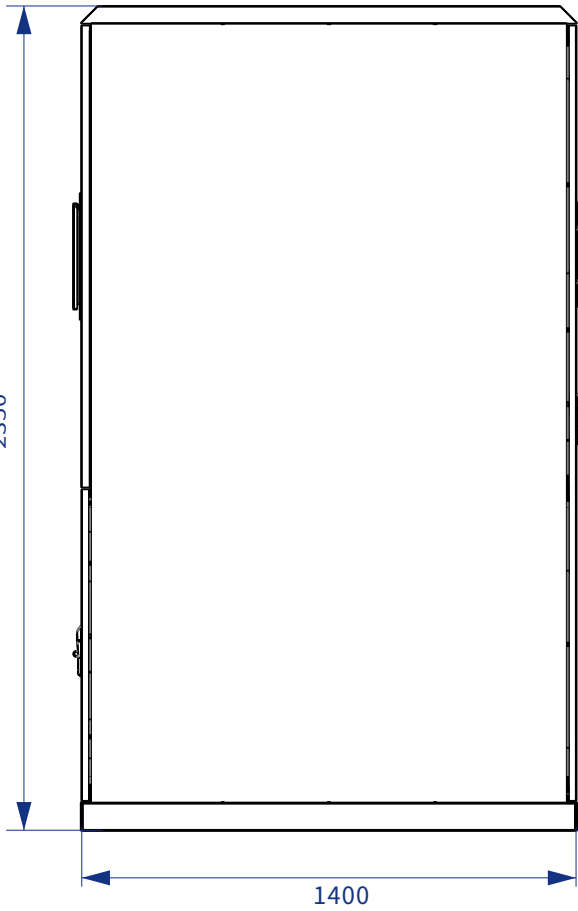
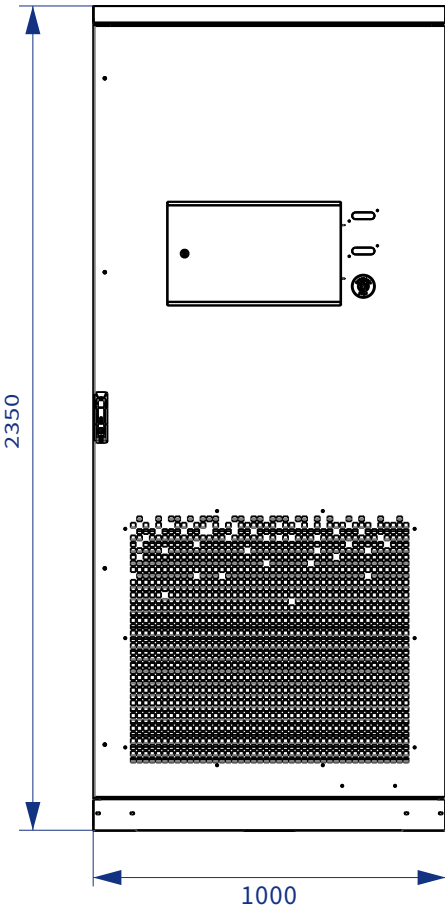
- High Efficiency Liquid Cooling Technology, Battery Cell Temperature Difference <3°C.
- All-in-one Design, Cabinet Transportation, Plug-in and Ready To Use.
- Intelligent Monitoring System, Integrated Management Of BMS and EMS. More Intelligent and Safe
- Built-in Independent Fire Protection System
- 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 0124-100:2020-06, EN 50549-1: 2019; Module Certifications: UL9540A, IEC61629, UN38.3, FCC, EMC, EN62477-1, IEC60529; Battery Certifications: UL1973, UL9540A, IEC61629, UN38.3, GB/T36276-2018, ROHS, MSDS.

Model	TESS-100-233-Y	TESS-120-233-Y	TESS-240-233-Y
AC (Grid tied)			
Apparent Power	110kVA	125kVA	240kVA
Rated Power	100kW	116.5kW	233kW
Rated Voltage	400V		
Rated Current	144A	168A	336A
Voltage Range	360V ~ 440V		
Frequency	50/60Hz		
THDI	<3%		
Power Factor	- 0.9 leading ~ 0.9 lagging		
Wire Connection	3 / N / PE		
AC input	110kVA	125kVA	240kVA
AC (Off-grid)			
Apparent Power	110kVA	125kVA	240kVA
Rated Power	100kW	116.5kW	233kW
Rated Voltage	400V		
Rated Current	144A	168A	336A
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	100kWp		
Max. PV Power	1.1~1.4 times rated		
PV Voltage Range	400V ~ 700V DC		
Max. PV Current	100A×2		

Model	TESS-100-233-Y	TESS-120-233-Y	TESS-240-233-Y
Basic Parameters			
On/off grid switch function	Assorting		
On/off grid switch time	≤10ms		
Noise	<70dB@25°C		
IP Level	IP54 (Battery IP67)		
Fire Protection	Aerosol + C6F12O (Optional) fire extinguisher		
Operating Temperature	-30°C ~ +60°C (>45°C derating)		
Protection Function	Over /under voltage, Over current, Over/low temperature, SOC too high/low Low insulation impedance, Short circuit protection, etc		
Cooling	Air Cooling + Liquid Cooling		
Relative Humidity	0 ~ 95%, without condensation		
Max. Efficiency	4000m (>2000m derating)		
Dimensions (W×D×H)	1000×1400×2350mm		1300×1300×2300mm
Weight	2500kg		
Communication			
	Touch Screen		
Communication	RS485 / LAN		



Product Dimensions



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.

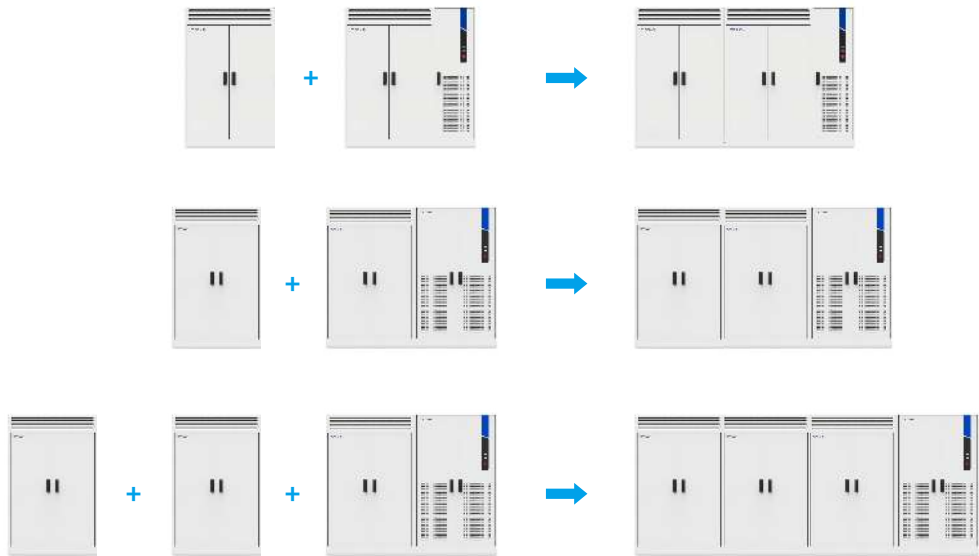
- Modular design, can be flexibly configured according to requirements.
- Independent battery and electrical space design enhances the level of protection.
- Arbitrary standardized expansion, flexible and can be used in a variety of scenarios.
- Professional cloud platform monitoring, multi-dimensional 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				

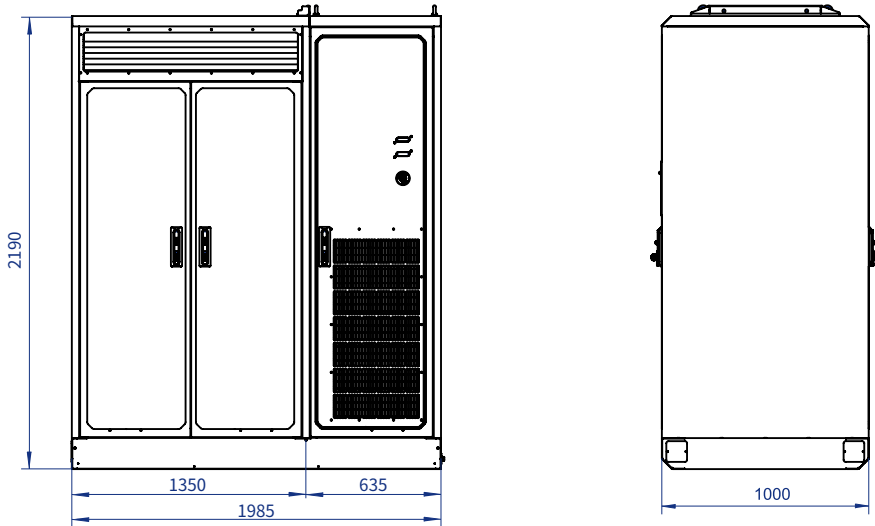
Note: * Battery energy capacity can be added multiply.
* The system supports inverter parallel operation, please contact manufacturer for details.

Combination Parallel

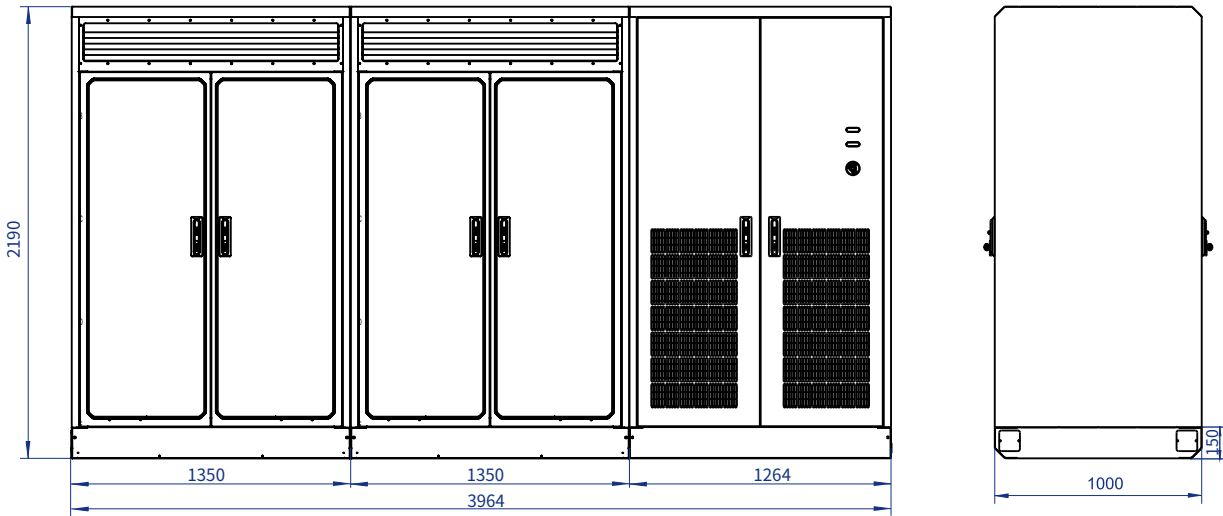


Product Dimensions

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.

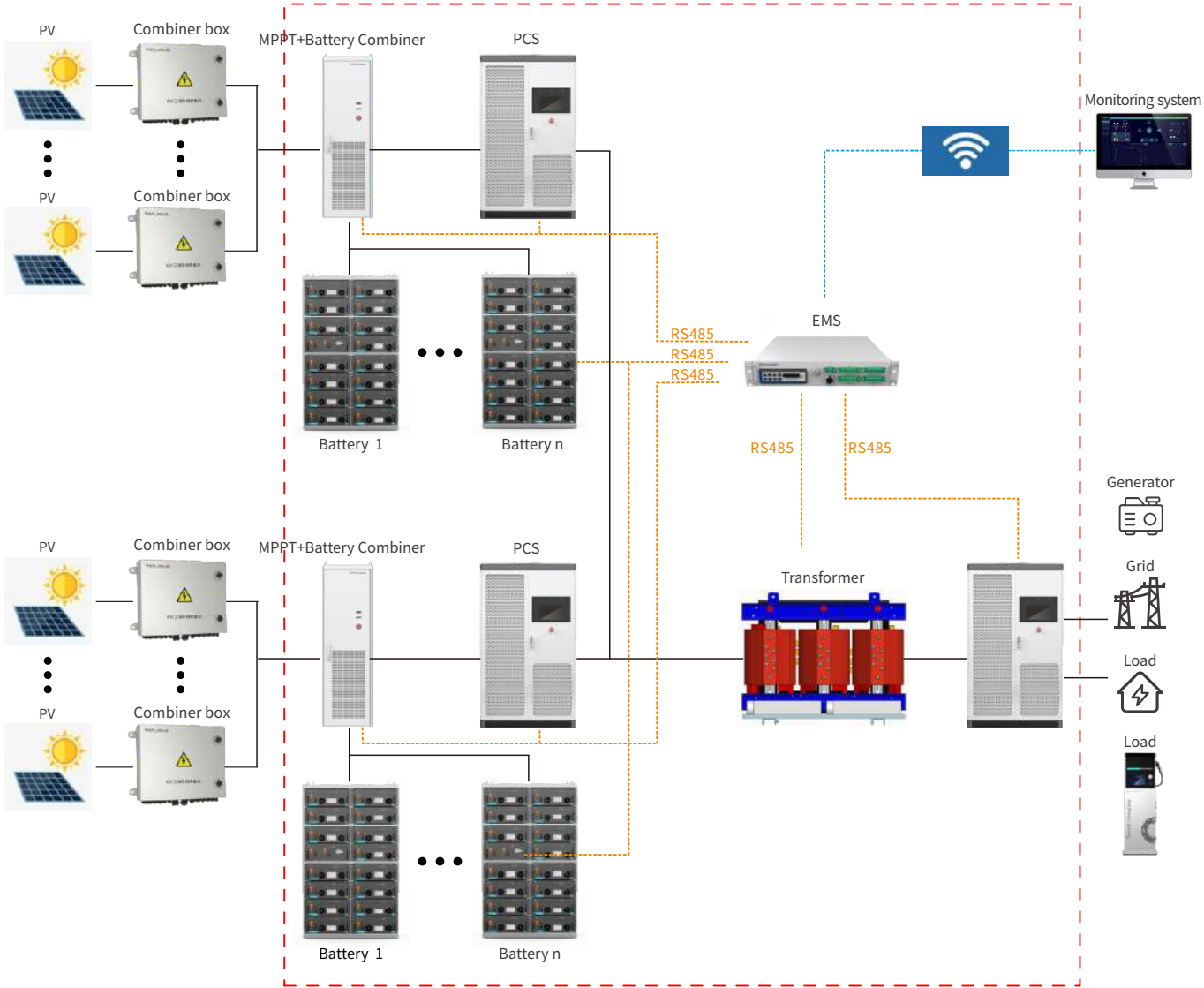
Module Certifications:

GB/T36276-2018、IEC61629、UN38.3、EMC.

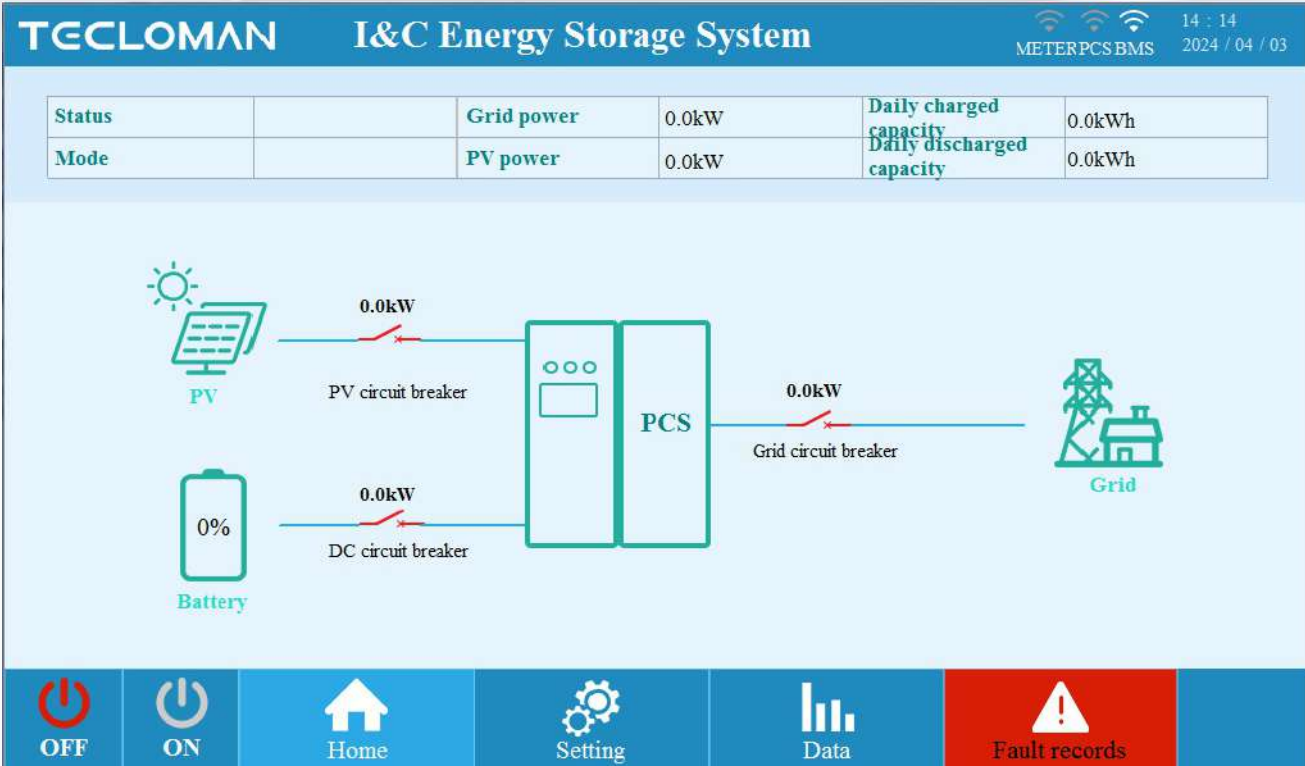
Battery Certifications:

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

Product Principle



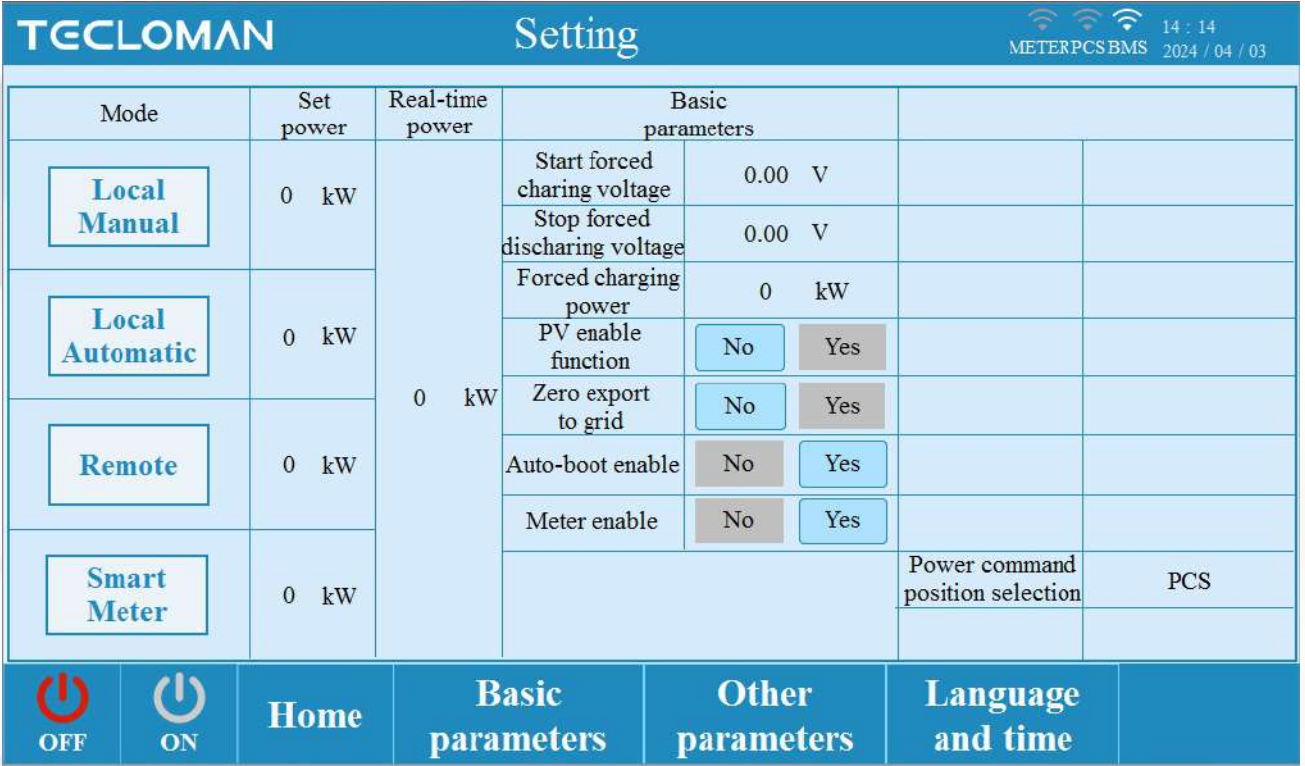
- * Remarks:
1. This system adopts standard container integration, container size is standard 20 feet or 40 feet.
 2. 40-foot standard containers are used for systems with battery power over 1000kWh, and 20-foot standard containers are used for systems with battery power below 1000kWh.
 3. 20-foot container 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;

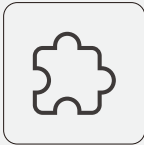
Local EMS Control



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.



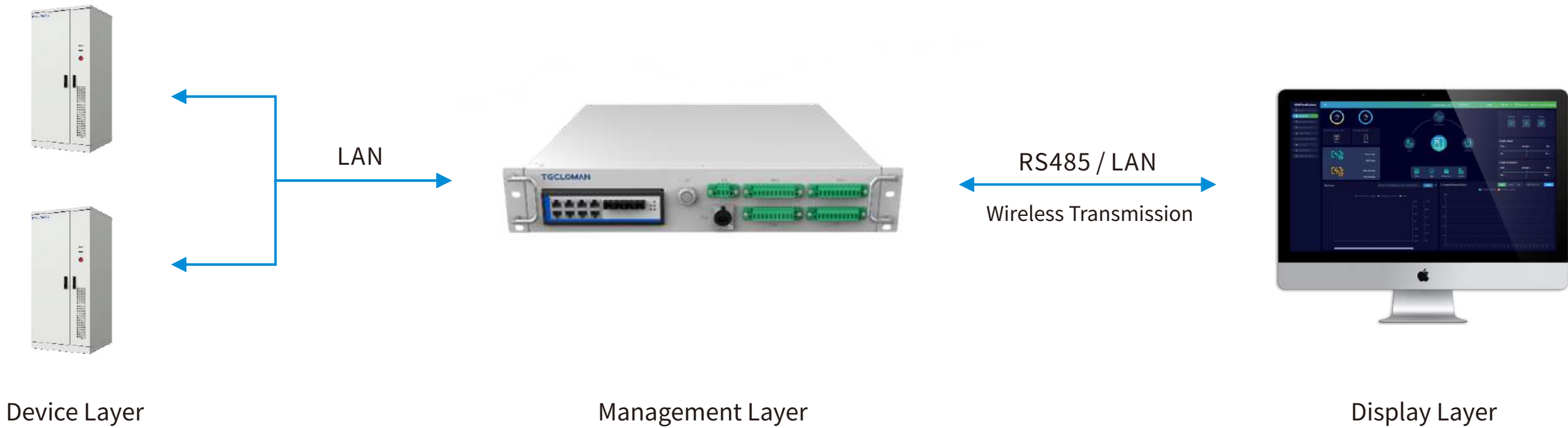
Fault Alarm
Collect fault alarms among devices, including time, level, status, etc.



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