

ELEKSTOR LIMITED

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# ENERGY STORAGE SYSTEMS



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# ABOUT US

EleKstor is a sustainable energy company delivering innovation and scalable Energy Storage and Management systems to our customers. Headquartered in the United Kingdom, EleKstor specialises in integrated "Energy Storage Systems". EleKstor delivers the full range of BESS systems including a range of "All in One" air & liquid cooled Cabinets.

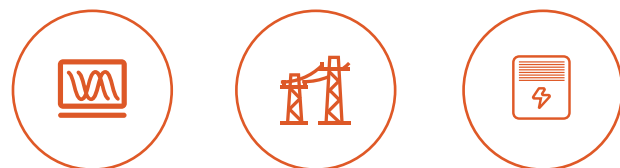
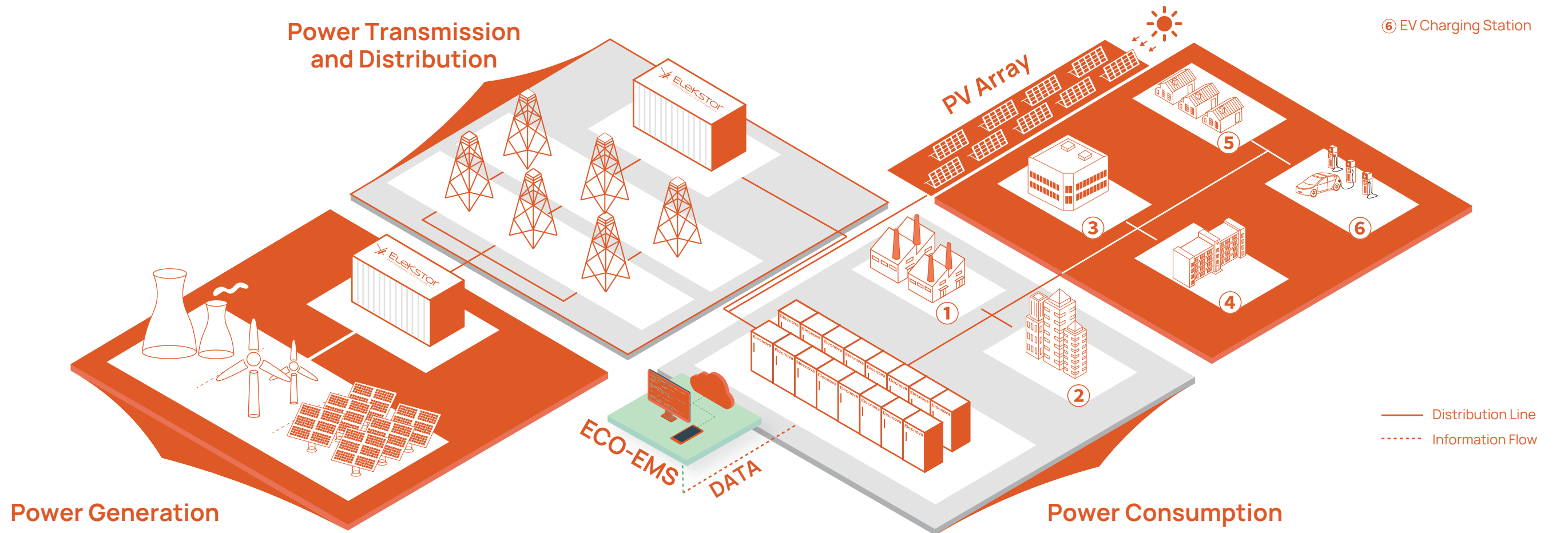
Our "All in One" cabinets incorporate all the modules required for a complete ESS in one easy to deliver and install product. EleKstor has a comprehensive range of products that range from an "All in One" air cooled 64 kWh hybrid Solar ESS cabinet to a 5.015 MWh liquid cooled battery container. We are focused on fulfilling diverse ESS requirements with a range of products to address the needs of our customers.

Our commitment extends to delivering outstanding customised products and services that address scenarios across generation, grid and end-users in diverse industries.



# Application of ESS

Provide one-stop industrial and commercial distributed energy storage battery system solutions with safety, reliability, efficiency and long cycle life.



# All-in-one Air-cooled Hybrid Solar ESS Cabinet

ECO-E64WX



## Product Introduction

ECO-E64WS is the entry level PV-plus ESS solution from Elekstor / Elecnova. The ECO-E64WS benefits from the accumulated expertise in the field of ESS integration and digital monitoring technology. Adopting the all-in-one design concept, this PV-plus ESS cabinet integrates a lithium battery ESS, hybrid inverter, HVAC, FSS & BCQ to deliver a compact footprint that enables ease of installation, service and support. The system incorporates a flexible capacity expansion capability supporting multiple operating modes including self-use, peak shaving, and backup power.

## Product Features



**Economic & Efficient**  
RTE over 87%, DOD over 95%



**In-House Development**  
PACK, BMS and EMS are all in-house developed ensuring optimum compatibility.



**Safe & Reliable**  
IP55, optimized ventilation design, temperature difference within 6°C



**Expandable & Modular**  
Easy modular design supports parallel connection for convenient system expansion.



**Compact & Convenient**  
0.96m<sup>2</sup> footprint, easy to transport and install.



**Easy O&M**  
Support multiple ways of operation and maintenance, including onsite, cloud.



**PV pluggable**  
Support PV connection.



**Versatile**  
Support multiple brands of hybrid inverter

## Specifications

### Battery Input

Cell Type	LFP 120Ah, 100%DOD, 25°C,1P
Battery System	1P168S
Rated Energy	64.512kWh
Rated Voltage	537.6V
Voltage Range	470.4V~604.8V

### PV Input

PV Voltage	200V~850V
MPPT	4
MAX. Input Current	30A*4

### AC Output

Rated Power	50kW
Max. Power	55kW
Nominal Voltage	400Vac/3P+N+PE
Nominal Frequency	50Hz/60Hz
THDi	< 3%
DC Ratio	< 0.5%I <sub>pn</sub>
Power Factor	-0.98~0.98

### General

Efficiency	≥ 87%
Charge/Discharge Rate	0.8P
DoD	95%(25±2°C)
Cycle Life	≥ 5500 Cycles
Ingress Rating	IP55
Cooling	Force air colling
Operating Temperature	-25~55°C
Humidity	0~95%RH, non-condensing
Altitude	≤ 2000m(derating above 2,000m)
Dimensions(W*D*H)	800*1200*2030mm
Weight	1t
Fire Safety	Aerosol
Connective	Ethernet/RS485
Compliance	UN38.3, IEC62477, IEC61000, IEC62619, IEC63056, UL9540A, EN50549
Grid Connection Certifications	G99, VDE-AR-N 4105 / VDE V 0124, EN 50549-1 / EN 50549-10, VDE 0126 / UTE C 15 / VFR,2019, NTS 631 / RD 1699 / RD 244 / UNE 206006 / UNE 206007-1, CEI 0-21, C10/11, NRS 097-2-1, TOR, EIFS 2018.2,IEC 62116, IEC 61727 , IEC 60068 , IEC 61683, EN 50530, MEA, PEA, PORTARIA Nº 140, DE 21 DE MARÇO DE 2022





# All-in-one Air-cooled Hybrid Solar ESS Cabinet

ECO-E107WS



## Product Introduction

ECO\_E107WS is the higher capacity PV-plus ESS solution by Elekstor /Elecnova. The ECO-E107WS benefits from the accumulated expertise in the field of ESS integration and digital monitoring technology. Adopting the all-in-one design concept, this PV-plus ESS cabinet integrates a lithium battery ESS, hybrid inverter, HVAC, FSS & BCQ to deliver a compact footprint that enables ease of installation, service and support.

The system incorporates a flexible capacity expansion capability supporting multiple operating modes including self-use, peak shaving, and backup power.

## Product Features

**Economic & Efficient**  
RTE over 90%, DOD over 95%

**In-house developed**  
LFP280Ah battery cell system integration, leading cost advantage, 3S fusion.

**Safe & Reliable**  
IP55, optimized ventilation design, temperature difference within 6°C

**Expandable & Modular**  
Easy modular design supports parallel connection for convenient system expansion.

**Compact & Convenient**  
0.96m<sup>2</sup> footprint, easy to transport and install.

**Easy O&M**  
Support multiple ways of operation and maintenance, including onsite, cloud.

**PV pluggable**  
Support PV connection.

**Versatile**  
Support multiple brands of hybrid inverter

## Specifications

### Battery Input

Cell Type	LFP 280Ah, 100%DOD, 25°C, 0.5P
Battery System	1P120S
Rated Energy	107.52kWh
Rated Voltage	384V
Voltag Range	336~432V

### PV Input

PV Voltage	150V~850V
MPPT	4
MAX. Input Current	40A*4

### AC Output

Rated Power	50kW
Max. Power	55kW
Nominal Voltage	400Vac/3P+N+PE
Nominal Frequency	50Hz/60
THDi	< 3%
DC Ratio	0.5%lpn
Power Factor	-0.98~0.98

### General

Efficiency	≥90%
Charge/Discharge Rate	0.5P
DoD	95%(25+2°C)
Cycle Life	≥8000 Cycles
Ingress Rating	IP55
Cooling	Force air colling
Operating Temperature	-25~55°C
Humidity	0~95%RH, non-condensing
Altitude	≤2000m(derating above 2,000m)
Dimensions(W*D*H)	800*1200*2100mm
Weight	1.2 t
Fire Safety	Aerosol
Connective	Ethernet/RS485
Compliance	UN38.3, IEC62477, IEC61000, IEC62619, IEC63056, UL9540A, EN50549

### Grid Connection Certifications

G99, VDE-AR-N 4105 / VDE V 0124, EN 50549-1 / EN 50549-10, VDE 0126 / UTE C 15 / VFR, 2019, NTS 631 / RD 1699 / RD 244 / UNE 206006 / UNE 206007-1, CEI 0-21, C10/11, NRS 097-2-1, TOR, EIFS 2018.2, IEC 62116, IEC 61727, IEC 60068, IEC 61683, EN 50530, MEA, PEA, PORTARIA Nº 140, DE 21 DE MARÇO DE 2022





# All-in-one Air-cooled Energy Storage Cabinet

ECO-E100WX

## Product Introduction

The all-in-one air-cooled ESS cabinet integrates long-life battery, efficient balancing BMS, high-performance PCS, active safety system, smart distribution and HVAC into one cabinet, enabling long-term operation with safety, stability and reliability. Through AC side parallel connection, it achieves agile deployment of ESS power station with flexible capacity expansion.



## Product Features



### Economical and Efficient

Conversion efficiency of above 89%, battery discharge depth greater than 95%.



### Safe and Reliable

IP55 protection level, reasonable air duct design, battery cell temperature difference within 5°C.



### 1P fast charge / discharge rate



Support DC-DC modular expansion to achieve PV access.



Support hybrid inverter (optional) to achieve integration of PV and ESS.



### In-house Development

In house developed PACK, PCS, BMS and EMS systems ensure optimum product compatibility



### Convenient Operation and Maintenance

Manual, automatic or intelligent operation capabilities. Maintenance management functions. includes APP and remote cloud platform and offline modes.

## Specifications

### DC Battery Parameters

Cell Type	LFP 120Ah
Battery System	1P264S
Rated Energy	101kWh
Rated Voltage	844.8V
Voltage Range	739.2V~950.4V

### AC Parameters

Rated Power	100kW
Max. Power	110kW
Nominal Voltage	400Vac/3P+N+PE
Nominal Frequency	50Hz/60Hz
THDi	≤3%
DC Ratio	<0.5%Ipn
Power Factor	-1 lagging~1 leading

### System Parameters

Efficiency	≤ 89%
Charge/Discharge Rate	1P
DoD	95% (25±2°C)
Cycle Life	≥ 5000 cycles
Ingress Rating	IP55
Cooling	Forced air cooling
Operating Temperature	-25°C~55°C
Humidity	0~95%RH, non-condensing
Altitude	≤ 2,000m (derating above 2,000m)
Dimensions (W*D*H)	1,250*1,200*2,250 (mm)
Weight	2,000kg
Fire Safety	Aerosol
Connectivity	Ethernet /RS485
Compliance	UN38.3, IEC62619, UL1973, UL9540, CE-EMC





# All-in-one Air-cooled Energy Storage Cabinet

ECO-E215WS

## Product Introduction

The all-in-one air-cooled ESS cabinet integrates long-life battery, efficient bidirectional-balancing BMS, high-performance PCS, active safety system, smart distribution and HVAC into one cabinet, enabling long-term operation with safety, stability and reliability. Through AC side parallel connection, it achieves agile deployment of ESS power station with flexible capacity expansion.



## Product Features



### Economical and Efficient

Conversion efficiency over 90%,  
DoD over 95%.



### Safe & Reliable

IP55 protection level, optimized ventilation design,  
cells temperature difference within 5.



### Compact

1.6m<sup>2</sup> footprint only,  
easy transportation & fast installation.



### Flexible Expansion

Modular design, simplified parallel expansion,  
fast expansion.



### Self-developed

Self-developed PACK, PCS, BMS and EMS with good  
product compatibility.



### Smart O&M

Diversified O&M access, both on APP & Cloud.

## Specifications

### DC Battery Parameters

Battery Cell Type	LFP
Battery Pack Configuration	17.92kWh/1P20S
Battery System Configuration	215kWh/1P240S
Battery Voltage Range	600~876V DC
System Rated Voltage	768V DC

### AC Parameters

Rated Power	100kW
Maximum Power	110kW (60s)
THDi	<3%
DC Ratio	<0.5%lpn
Nominal Voltage	400 AC
Power Factor	-0.98~0.98
Nominal Frequency	50Hz/60 Hz

### System Parameters

Conversion Efficiency	≥89%
Charge/Discharge Rate	≤0.5P
Discharge Depth	95%DOD
Number of Cycles	≥8,000 times(25±2 C)
Charge/Discharge Switching Time	<100ms
Communication Interface	Ethernet /RS485
Protection Level	IP55
Cooling Method	Forced Air Cooling
Operating Temperature	-25 °C~55 °C
Relative Humidity	0-95%RH, non-condensing
Noise	<75dB
Altitude	≤2,000m (derating for usage above 2,000m)
Fire Suppression System	Aerosol + Active Warning
Dimensions (W*D*H)	1,250*1,300*2,400 (mm)
Weight	2,500kg
Compliance Standards	UN38.3, IEC62619, UL1973, UL9540 and CE-EMC





# All-in-one Liquid-cooled Energy Storage Cabinet

ECO-E233LS

## Product Introduction

The liquid-cooled cabinet includes state-of-the-art cabinet-level liquid cooling and temperature balancing techniques. With a cell temperature variance of less than 3°C, it enhances the uniformity of cell temperature and prolongs battery lifespan. As a result of the cooling techniques, the ESS is able to benefit from greater energy density. This enhances the economic viability. The cabinet integrates long-life Lithium Ferrous Phosphate battery chemistry, efficient bidirectional-balancing Battery Management System (BMS), high-performance Power Conversion System (PCS), active safety system, smart distribution into one cabinet.



## Product Features



### Compact

1.4m<sup>2</sup> footprint only, save 35% space compared with air-cooled.



### High Integration

Liquid cooling delivers higher power density and long term stability.



### Efficient

Optimal in-PACK duct design, achieve high-efficient cooling and low energy consumption.



### Long Cycle Life

Over 8,000 times cycle life.



### Flexible Expansion

Modular design, simplified parallel expansion.



### Ultimate Safety

In-PACK and triple-level fire safety.

## Specifications

### DC Battery Parameters

Cell Type	LFP 3.2V/280Ah
PACK	46.6kWh/1P52S
Battery System	233kWh/1P260S
Voltage Range	728~936Vdc
PACK Ingress Rating	IP65

### AC Parameters

Rated Power	100kW
Max. Power	110kW
THDi	<3%
DC Ratio	<0.5%lpn
Nominal Voltage	400Vac
Power Factor	-1 lagging~1 leading
Nominal Frequency	50/60 Hz

### System Parameters

System Efficiency	≥91%
Charge/Discharge Rate	≤0.5P
DoD	95%
SOC Accuracy	<3%
Cycle Life	≥8,000 times
Switching Time	<100ms
Connectivity	Ethernet /RS485
Ingress Rating	IP55
Cooling	Liquid Cooling
Operating Temperature	-25°C~55°C
Humidity	5-95%RH, non-condensing
Noise	≤75dB
Altitude	≤2,000m (derating above 2,000m)
Fire Safety	Combustible gas detection/smoke detection/temperature detection + active warning + module-level fire suppression (Perfluoro)
Dimensions (W*D*H)	1,050*1,350*2,400 (mm)
Weight	2800kg
Compliance	UN38.3, IEC61619, UL1973, UL9540 and CE-EMC





# Liquid-cooled Battery Cabinet

ECO-B372LS

## Product Introduction

The liquid-cooled cabinet includes state-of-the-art cabinet-level liquid cooling and temperature balancing techniques. With a cell temperature variance of less than 3°C, it enhances the uniformity of cell temperature and prolongs battery lifespan. As a result of the cooling techniques used, the cabinet is able to deliver greater energy density. The increased energy density enhances economic viability of the platform. The cabinets can be connected in parallel to deliver the required storage capacity for the site. The battery storage cabinets are connected to a PCS and ESS control system to deliver a bespoke customer storage installation.



## Product Features



### Compact

Less footprint compared with air-cooled unit of same energy level.



### High Power Density

372kWh energy in one cabinet and ensure long-term endurance.



### Efficient

Optimal in-PACK duct design, achieve high-efficient cooling and low energy consumption



### Long Cycle Life

Over 8,000 times cycle life, excellent performance of battery system.



### Flexible Expansion

Modular design, simplified parallel expansion.



### Ultimate safety

In-PACK and triple-level fire safety.

## Specifications

Item	Specification
Configuration	1P416S
Rated Energy	372kWh
Rated Voltage	1331.2V DC
DC Voltage Range	1165~1498V DC
PACK Ingress Rating	IP65
Rated Charge/Discharge Rate	0.5C
Maximum Charge/Discharge Rate	0.6C (60s)
Operating Temperature	-20°C~55°C
Fire Safety	Combustible gas detection/smoke detection/temperature detection + Active warning + Module-level fire suppression (Perfluoro)
Ingress Rating	IP55
Cooling	Chiller+in-PACK liquid cooling
Altitude	≤2,000m (derating above 2,000m)
Dimensions (W*D*H)	1,300*1,300*2,400 (mm)
Compliance	UN38.3, IEC62619, UL1973, UL9540





# Air-cooled Battery Container

ECO-E20FT3404WS



## Features



### Safe & Reliable

High-end and ESS-specific LFP cells to achieve high energy density, long cycle life and non-spontaneous combustion.



### Precise Temp Control

One-cluster-one-air-conditioning achieves accurate temp control for battery consistency and modular temp strategy.



### Smart Cooling

Smart cooling ensures temperature difference not over 8.



### Smart O&M

Triple-level BMS achieves real-time monitoring and control of core from battery, PCS, HVAC, fire safety etc. EMS achieves remote monitoring and control to reduce cost and improve maintainability.



### String Design

Cooperate with modular PCS to eliminate battery system inconsistency caused by parallel connection of cells.



### Economical & Efficient

Low system cost, high charge/discharge efficiency, support various ESS applications.

## Specifications

Item	Specification
Configuration	10P380S
Rated Energy	3.404MWh
Rated Voltage	1216Vdc
Voltage Range	1064~1368Vdc
Charge/Discharge Rate	0.5C
Operating Temperature	-25 °C~55 °C
Fire Safety	NOVEC1230/aerosol+water
Ingress Rating	IP55
Cooling	Forced air cooling
Altitude	≤2,000m (derating above 2,000m)
Dimensions (W*D*H)	6,058*2,438*3,100 (mm)
Compliance	UN38.3

## Product Introduction

The 20-ft air-cooled ESS container product integrates PACK, BMS, PCS, EMS, HVAC and fire safety system in one container which has advantages such as high energy density, easy transportation, fast installation and high Ingress Rating. With AC output voltage of 690Vac, it can be connected to grid at medium-/high-voltage levels combined with step-up transformation. The 20-ft air-cooled ESS container product can be applied to power generation side, grid side, as well as C&I ESS scenarios which has strict requirements on power and capacity.





# Liquid-cooled Battery Container

ECO-E20FT4472LS



## Product Introduction

The 20-ft liquid-cooled ESS container product integrates PACK, EMS, BMS, HVAC, fire safety system into one cabinet. Compared with the air cooling, the liquid cooling empowers the ESS product with higher power density and ensures the temperature difference between the cells within 3°C, which effectively extends battery service life and improves energy efficiency. The 20-ft liquid-cooled ESS container product can be applied to power generation side, grid side, as well as C&I ESS scenarios which has strict requirements on power and capacity.

## Product Features



### Higher Energy Density

The 20-foot liquid-cooled energy storage container has a maximum capacity of 3.72MWh, providing higher energy density, and saving costs.



### Lower Local Power Consumption

The variable-frequency compressor adjusts its operating status based on temperature conditions, thus reducing the equipment's power consumption.



### Lower Operating Noise

The product significantly reduces the use of fans, resulting in lower noise compared to air-cooled products.



### Longer Service Life

The temperature consistency of battery cell temperatures extends the service life and enhances the safety of batteries, and increases returns.



### Better Temperature Control

In comparison to air cooling, the liquid cooling scheme reduces the battery cell temperature difference by 200%, keeping the temperature difference within 3°C.



### Higher Protection

The product utilizes the IP54 (PACK IP65) high protection level & C4 protection level and the high/low-temperature design.

## Specifications

Item	Specification
Configuration	12P416S
Rated Energy	4.472MWh
Rated Voltage	1331.2Vdc
Voltage Range	1165~1498Vdc
PACK Ingress Rating	IP65
Nominal Charge/Discharge Rate	0.5C
Maximum Charge/Discharge Rate	-25 °C~55 °C
Operating Temperature	NOVEC1230/aerosol+water
Fire Safety	IP55
Ingress Rating	Chiller+liquid cooling
Cooling	≤2,000m (derating above 2,000m)
Altitude	6,058x2,550x2,896 (mm)
Dimensions (W*D*H)	Cell: IEC 62619, UL9540A, UN38.3, UL1973
Compliance	Pack: UN38.3, IEC62477, IEC61000, IEC62619, IEC63056 System: IEC62477, IEC61000, IEC62619, IEC63056, UL9540A, UN3536, EN50549



# Air-Cooled PACK

ECO-P1P20WS



## Brief

The air-cooled PACK consists of standard 280Ah lithium iron phosphate (LiFePO<sub>4</sub>) battery cells of series and parallel connection, with the configuration method of 1P20S. It is internally configured with accessories such as the BMU battery monitoring module, high-voltage connector, fan and structural fixing members. This configuration provides the PACK module with protection functions against over-voltage, under-voltage, over-current, insulation, short-circuit and over-temperature issues. When combined with a PCS, it can store and release electric energy. In addition, this PACK is compatible with 1,500V system.

## Features



### Excellent Performance

Excellent electrical performance, utilizing laser welding, with good battery cell consistency and superior charge/discharge performance.



### Long Cycle Life

The battery cycle life exceeds 8,000 times, with a design services life of up to 10 years



### Safe and Reliable

The battery cell temperature difference is < 3 °C, enhancing safety.



### Flexible Configuration

The standardized and modular design allows for flexible capacity combinations based on requirements.

## Specifications

### ECO-PACK-P1P20S-W-CH

Battery Cell Type	Lithium Iron Phosphate Battery
Nominal Capacity	280Ah
Configuration Method	1P20S
Nominal Energy	17.92kWh (rated conditions)
Rated Voltage	64Vdc
Recommended Operating Voltage Range	56-72V DC (Individual battery cell 2.8-3.6V DC)
Rated Charge/Discharge Rate	0.5C
Cooling Method	Air Cooling
Cycle Life	≥8,000 times
Temperature and Humidity in Storage Environment	0~35°C, RH≤95%
Operating Temperature Range	-25°C~50°C
Protection Level	IP20
Product Dimensions (W*D*H)	470*950*231mm
Weight	135kg
Compliance Standards	IEC62619, UL1973, UL9540





# Liquid-cooled PACK

ECO-P1P52LS



## Product Introduction

The liquid-cooled PACK consists of standard 280Ah lithium iron phosphate (LiFePO<sub>4</sub>) battery cells of series and parallel connection. with the configuration method of 1P52S. It is internally configured with accessories such as the BMU battery monitoring module, high-voltage connector, liquid cooling plate and structural fixing members. This configuration provides the PACK module with protection functions against over-voltage, under-voltage, over-current, insulation, short-circuit and over-temperature issues. When combined with a PCS, it can store and release electric energy.

## Product Features



### Excellent Performance

Excellent electrical performance, utilizing laser welding, with good battery cell consistency and superior charge/discharge performance.



### High Integration

High energy density, with internally integrated BMU moduled for real-time monitoring of battery cell status.



### Safety and Reliability

The battery cell temperature difference is <math>\lt; 3^{\circ}\text{C}</math>, enhancing safety.



### Flexible Expansion

The standardized and modular design allows for flexible capacity combinations based on requirements.



### Long Service Life

The battery cycle life exceeds 8,000 times, with a design service life of up to 10 years.



### Advanced Protection

The production level of the product can be up to IP65, suitable for various on-site operating environments.

## Technical Parameters

### ECO-PACK-1P52S-L-CH

Battery Cell Type	Lithium Iron Phosphate Battery
Normal Capacity	280Ah
Configuration Method	1P52S
Normal Energy	46.59kWh (rated conditions)
Rated Voltage	166.4V DC
Recommended Operating Voltage Range	145.6-187.2V DC (individual battery cell 2.8-3.6V DC)
Rated Charge/Discharge Rate	0.5C
Cooling Method	Liquid Cooling
Cycle Life	$\geq 8,000$ times
Temperature and Humidity in Storage Environment	0~35 $^{\circ}\text{C}$ , RH $\leq 95\%$
Operating Temperature Range	-25 $^{\circ}\text{C}$ ~50 $^{\circ}\text{C}$
Protection Level	IP65
Product Dimensions (Weight*Depth*Height)	812*1132*238mm
Weight	330kg
Compliance Standards	UN38.3, IEC62619, UL1973, UL9540



# Battery Management System (ECO-BMS)

## Product Introduction

The energy storage BMS solution supports two modes a three-level architecture (BMU sub-control module + BCU main control module + BCU main control module + BSU master control module) and a two-level architecture (BMU sub-control module + BCU main control module). The master control module can be configured with an HMI display screen for centralized data presentation. The system provides an integrated solution for data acquisition, data analysis, logic processing and data mapping. It offers over-charge, over-discharge, over-current, over-temperature and short-circuit protection for battery clusters. It can also provide real-time detection, fault diagnosis and warning for the battery's safety status. The main control unit within the cluster can accurately estimate SOC/SOH and offer insulation detection capabilities with accuracy exceeding national standards, ensuring the efficient, reliable and safe operation of the energy storage system.

## Product Features



### Complete Architecture

The product is compatible with both two-level and three-level architectures, and supports the distributed and centralized operating scenarios.



### High-Precision Insulation Estimation

It has a flexible insulation diagnosis solution, and is adaptable to both two-level and three-level architectures, with accuracy higher than 2%.



### Rich Interfaces

Various types of DI/DO interfaces are provided to meet the requirements for status input and control of the fire suppression equipment and other relevant equipment.



### Wide Applications

The product supports multiple scenarios, including air cooling and liquid cooling.



### Protocol Compatible

It supports multiple PCS protocols.



### SOC Estimation Accuracy

Error < 5%.



### Ultra-Low Power Consumption

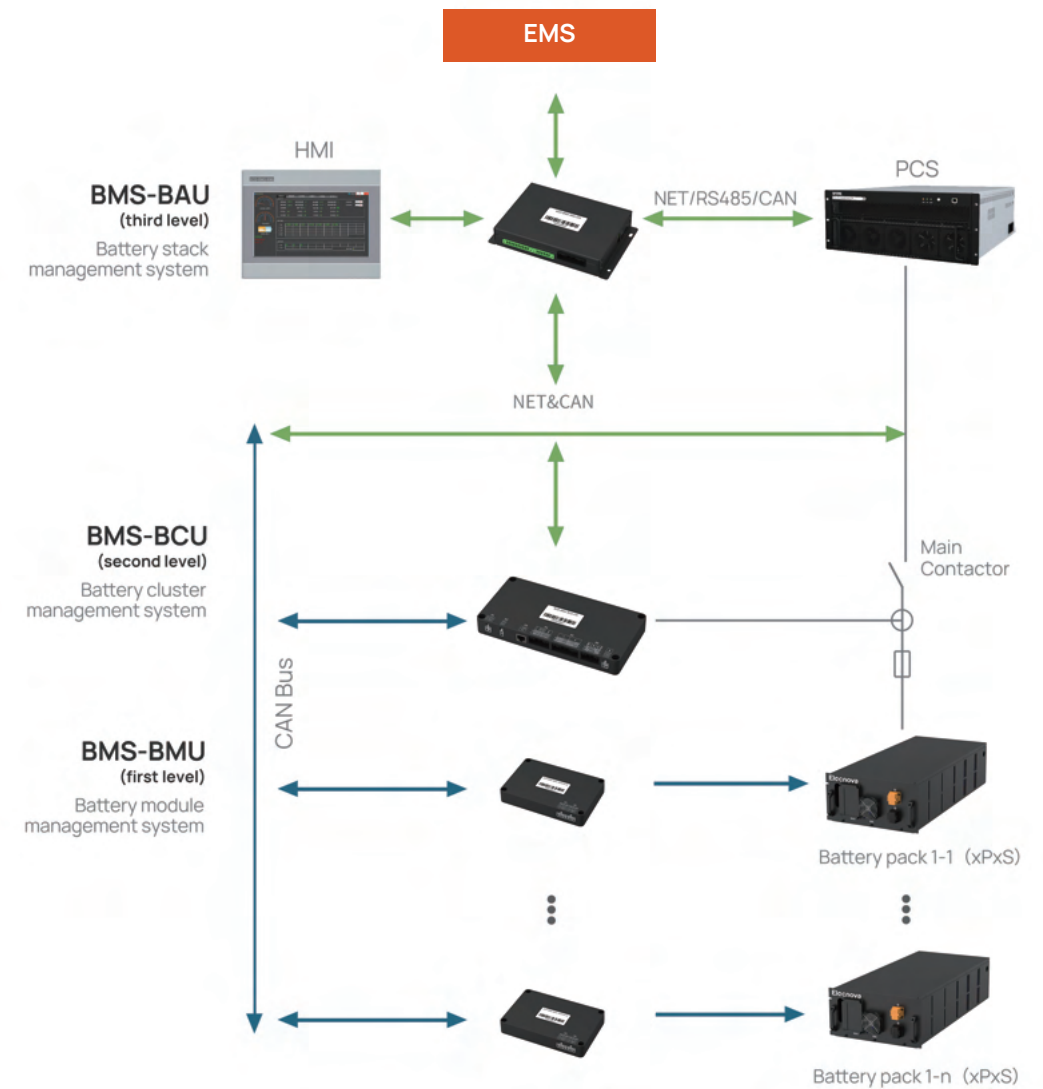
It has the flexible power supply and self-sleep function.



### Real-Time Response

100ms sampling interval, ensuring the data timeliness.

## Typical Architecture





## Specifications (Battery Module Unit ECO-BMS-BMU)



BMU-S24PB-A



BMU-S64PB-A

### Product Functions

- Acquisition of individual battery voltage
- Acquisition of battery temperature
- Module fan PWM speed adjustment
- Passive balancing execution
- Liquid leakage monitoring
- Module fan feedback
- Module fan control

Main Technical Parameters		Minimum Value	Typical Value	Maximum Value			Unit
				BMU-S24PB-CH	BMU-S24PB-CI	BMU-S64PB-CH	
Auxiliary Power Supply	Voltage	9	24	32			V
Operating Environment	Temperature	-25	—	65			°C
	Relative Humidity	5	—	95			%
Individual Battery Voltage	Voltage Range	0	—	5			V
	Sampling channel	—	—	24	24	64	mV
	Insulation Resistance	—	100	—			MΩ
Insulation and Withstand Voltage	Rated Operating Voltage	1500			V		
	Withstand Voltage	50Hz 3,000VAC applied between voltage sampling terminal and housing and digital interface terminal for 1 minute without breakdown or flashover					
Temperature Sampling	Temperature Range	-40	—	125			°C
	Number of Sampling Points	—	—	24	24	64	—
	Sampling Accuracy	—	1	—			°C
Passive Balancing	Current	—	—	100mA Passive Balancing			mA
DI/DO	DI Channels	—	—	2			Channel
	DO Channels	—	—	1			Channel
Signal Wiring	Wiring	—	—	Side connection	Back connection (Hidden)	Side connection	—

## Product Parameters (Main Control Unit BMS-BCU-CH)



### Product Functions

- Total voltage acquisition, main circuit current, insulation resistance and temperature detection
- Control of main circuit contactor and pre-charge relay, as well as status detection of relay
- Communication with sub-control unit for information acquisition of sub-control individual voltage and temperature
- Communication with master control unit to upload battery system information
- Communication with display screen (only for two-level architecture), PCS and EMS to display battery system information
- Passive balancing control algorithm, single cluster SOC/SOH calculation
- Sub-control address allocation control, sub-control fan control, system alarm and protection operations
- System battery data storage
- Multiple digital input/output channels (active/passive)

Main Technical Parameters		Minimum Value	Typical Value	Maximum Value	Unit
Auxiliary Power Supply	Voltage	9	24	32	V
Operating Environment	Temperature	-25	—	65	°C
	Relative Humidity	5	—	95	%
5V Output			1		Channel
12V Output			1		Channel
Total Voltage Sampling	Voltage Range	100	—	1500	V
	Sampling Accuracy		±0.5		%
Shunt Current Sampling	Current Range	-500	—	500	A
Hall Current Sampling	Sensor Power Supply Voltage		5		V
	Current Range	—	80	—	mA
Insulation Resistance	Detection Range	0	—	10	MΩ
	Rated Operating Voltage		1500		V
Insulation and Withstand Voltage	Withstand Voltage	50Hz/3,000VAC applied between voltage sampling terminal and housing and digital interface terminal for 1 minute without breakdown or flashover			
Analog Input	Voltage Range	0	—	3.3	V
	Temperature Sampling Accuracy		±1		°C
Digital Input/Output	DI		8		Channel
	DO		8		Channel
SOC	Calculation Error		5		%
CAN			3		Channel
RS485			3		Channel
Ethernet			1		Channel



## Product Parameters (Master Control Unit BMS-BAU-CH)



### Product Functions

- Three-level architecture system management
- Communication with the main control unit to summarize information from the multi-cluster battery system
- Communication with the display screen, PCS and EMS to display all battery system information
- System alarms and protection operations
- Multiple digital input/output channels (active/passive)

Main Technical Parameters		Minimum Value	Typical Value	Maximum Value	Unit
Auxiliary Power Supply	Voltage	9	24	32	V
Operating Environment Quantity	Temperature	-25	—	65	°C
	Relative Humidity	5	—	95	%
Digital Input	High-side	6 high-level effective inputs			—
	Low-side	6 low-level effective inputs			—
Passive Dry Contact	Normally Open	12			Channel
	Normally Closed	2			Channel
CAN		3			Channel
RS485		5			Channel
Ethernet		1			Channel

## Product Parameters (Human-machine Interface ECO-BMS-HMI)



Product Model	ECO-BMS-HMI-7	ECO-BMS-HMI-10.2
LCD Screen	7" TFT	10.2" TFT
Resolution	800×480	1024×600
Memory	128M	128M
Interface	2 channels serial interface, 2 channels USB interface	2 channels serial interface, 2 channels USB interface, 1 channel Ethernet interface
Power Supply	24±20%V DC	24±20%V DC
Overall Dimensions	226mm×163mm	271mm×213mm
Hole Dimensions	215mm×152mm	260mm×202mm








# Power Conversion System (ECO-PCS)




## Product Introduction

The ECO-PCS series product is modular converted designed specifically for small-sized energy storagesystems. It has a maximum rated power of 200kW and serves as a bidirectional energy converter within the entire energy storage system. It can meet the demands of various applications scenarios, such as the industrial and commercial energy storage, substation area energy storage, photovoltaic energy storage micro-grid, etc.



## Product Features

- 
**Ultra-High Efficiency**  
 The product adopts the seventh generation of IGBT, three-level topology and the minimum switching loss modulation methods, achieving a conversion efficiency of up to 99%.
- 
**High Reliability**  
 Power components and control sections are of IP65 protection level, offering millisecond-level on-grid and off-grid switching, with high reliability.
- 
**Unique Design**  
 The three-phase four-leg design makes the product suitable for the application scenarios of both single-phase and three-phase loads, with active and reactive power control functions.

- 
**Flexible Configuration**  
 The product is modular and expandable with multiple units connected in a parallel way, with a 380V output that can be directly connected to the low-voltage power distribution side of users.
- 
**Flexible Applications**  
 It supports an ultra-wide DC voltage input range, and is suitable for the application scenarios of various battery types.
- 
**Ultra-Strong Loading Capability**  
 The product has a 100% three-phase unbalanced loading capability, with strong resistance to load impact.

## Technical Parameters

DC Side Parameters	ECO-PCS-100/0.4-S-CH	ECO-PCS-100/0.4-T-CH
Voltage Range	615~950V DC	650~900V DC
Maximum Current	165A	165A
Maximum Voltage	1000V DC	1000V DC
Maximum Power	110kW	110kW
AC Side Parameters		
AC Rated Power	100kW	100kW
AC Maximum Power	110kW	110kW
AC Current Distortion Rate	< 3%	< 3%
Wiring Method	Three-phase three wiring	Three-phase four-wiring
Rated Grid Voltage	400V AC	400V AC
Power Factor	> 0.99	> 0.99
Adjustable Power Factor Range	-1 ~ 1	-1 ~ 1
Rated Grid Frequency	50Hz	50Hz
System Parameters		
System Maximum Efficiency	≥ 98%	≥ 98%
Charge/Discharge Switching Time	≤ 50ms	≤ 50ms
Communication Interface	RS485/LAN/CAN	RS485/LAN/CAN
Protection Level	IP20	IP20
Cooling Method	Forced Air Cooling	Forced Air Cooling
Operating Temperature	-20~50 C	-20~50 C
Relative Humidity	5~95%RH	5~95%RH
Dimensions (Width*Height*Depth)	520*650*215mm	690*650*215mm
Weight	50kg	65kg
Compliance Standards	IEC62477-1	

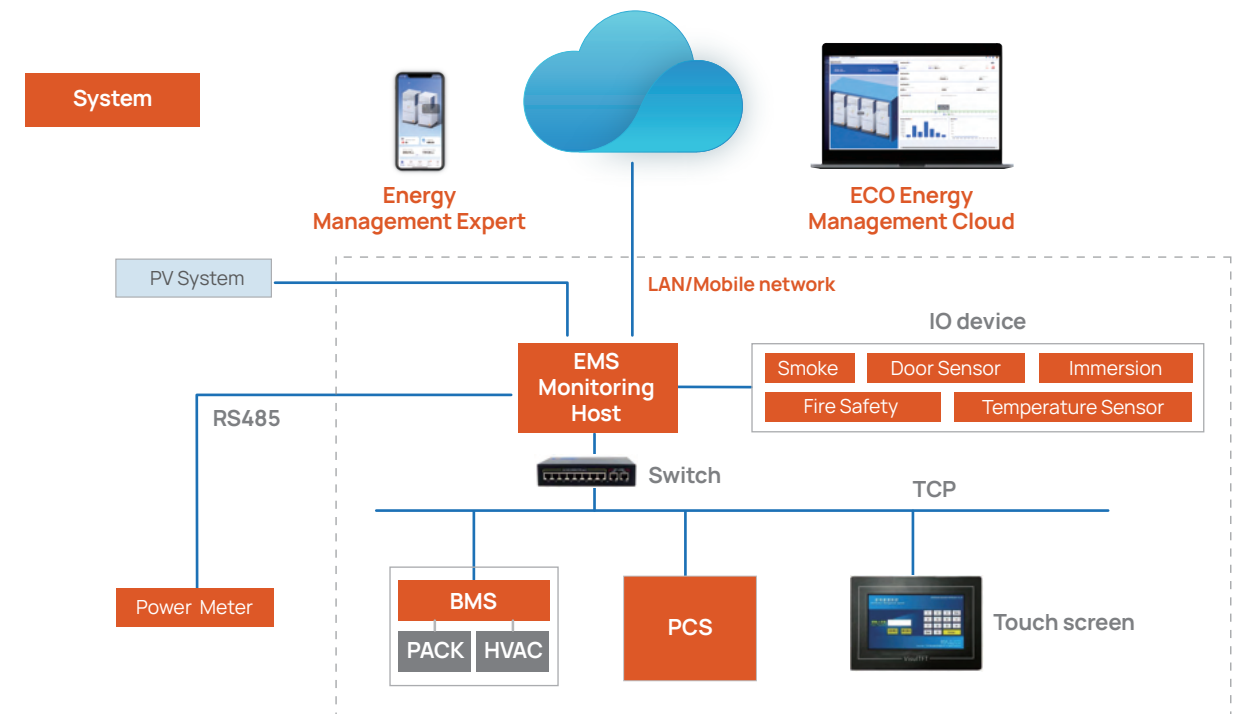


# Energy Storage Management System (ECO-EMS)

## System Introduction

The ECO-EMS series of products is an integrated energy management system designed for energy storage application scenarios. They enable real-time monitoring, diagnostic warning, panoramic analysis, advanced control, etc. of the system. These functions meet the demands for comprehensive operational monitoring, intelligent safety analysis, and dynamic panoramic analysis, ensuring the safety, reliability and cost-effective operation of energy storage systems.

The system adopts a cloud-edge integrated architecture design and is suitable for user-side energy storage systems, micro-grids, photovoltaic-storage-charge integration, and other application scenarios. This ensures that the system is in its optimal operation all the time, maximizing overall benefits of the system and shortening the investment payback period.



## Technical Advantages

- Convenient Operation and Maintenance with Remote Support**  
 Supporting 4G network module access for cloud-end operation and maintenance, also supporting local WIFI-APP access, achieving local commissioning and control.
- Stability, Reliability and Scalability**  
 The system adopts the bus monitoring method for reliable operation and supports bus wake-up. It can support the parallel operation of up to ten integrated machines, automatically forming a network, with automatic primary and backup operations for each node and application equipment.
- Flexible Strategies and Diverse Access**  
 Combined with energy storage application scenarios, the system supports various operational strategies such as real-time power control, load tracking, demand management and charge/discharge planning; allows access to distributed power generation equipment, supports photovoltaic-storage-charge coordination control and distributed consumption.
- Diverse Application Scenarios, Self-adaptive Operation**  
 When running in parallel, the system supports the flexible arrangement of single-bus or double-bus configurations. In addition, it can identify the bus operation mode to achieve the multi-machine self-adaptive operation and to ensure the line operation safety.



- Equipment Monitoring**  
 Real-time monitoring of the operating status of PCS, BMS, air conditioning, access control, fire protection equipment, smoke sensors, immersion sensors, temperature and humidity, and other relevant equipment, so as to achieve intelligent control.
- Intelligent Alert**  
 The system supports various notification methods, such as SMS and App push notifications, to help customers promptly address operational anomalies and ensure reliable system operation.
- Peak Load Shifting**  
 The system implements charges and discharge strategies to achieve "peak-valley arbitrage", i.e. charging the battery during off-peak hours and discharging it during peak hours.
- Demand Management**  
 By managing charge and discharge strategies, the system smooths the electrical load, and reduces peak power and maximum demand, thus reducing the basic electricity price for customers.
- Energy Time Shifting**  
 The system intelligently forecasts the new energy power generation and charges the battery when the new energy output is high. It discharge the battery when the new energy out is insufficient, maximizing the self-use ratio of photovoltaic power generation and reducing electricity costs of customers.
- Remote Operation and Maintenance**  
 The system supports remote fault diagnosis and remote maintenance, reducing equipment downtime and safety risks. In addition, it enhances equipment operation and maintenance efficiency and reduces operation and maintenance costs, ensuring system stability.
- Battery Health Analysis**  
 The system acquires data such as battery cell voltage, total current and state of charge (SOC), accurately assessing the battery health status based on the big data computation model.
- Photovoltaic-storage Coordination**  
 The system accurately forecasts the electrical load, intelligently controls the output of photovoltaic power generation and energy storage systems, thus improving the power supply reliability.





# Liquid-cooled Battery Container

ECO-E20FT5015LP



## Product Introduction

The 20-ft liquid-cooled ESS container product integrates PACK, EMS, BMS, HVAC, fire safety system into one cabinet. Compared with the air cooling, the liquid cooling empowers the ESS product with higher power density and ensures the temperature difference between the cells within 3°C, which effectively extends battery service life and improves energy efficiency. The 20-ft liquid-cooled ESS container product can be applied to power generation side, grid side, as well as C&I ESS scenarios which has strict requirements on power and capacity.

## Product Features



### Higher Energy Density

The 20-foot liquid-cooled energy storage container has a maximum capacity of 3.72MWh, providing higher energy density, and saving costs.



### Lower Local Power Consumption

The variable-frequency compressor adjusts its operating status based on temperature conditions, thus reducing the equipment's power consumption.



### Lower Operating Noise

The product significantly reduces the use of fans, resulting in lower noise compared to air-cooled products.



### Longer Service Life

The temperature consistency of battery cell temperatures extends the service life and enhances the safety of batteries, and increases returns.



### Better Temperature Control

In comparison to air cooling, the liquid cooling scheme reduces the battery cell temperature difference by 200%, keeping the temperature difference within 3°C.



### Higher Protection

The product utilizes the IP54 (PACK IP65) high protection level & C4 protection level and the high/low-temperature design.

## Specifications

Item	Specification
Configuration	12P416S
Rated Energy	5.015MWh
Rated Voltage	1331.2Vdc
Voltage Range	1164.8~1497.6Vdc
PACK Ingress Rating	IP65
Nominal Charge/Discharge Rate	0.5C
Maximum Charge/Discharge Rate	-25 °C~55 °C
Operating Temperature	NOVEC1230/aerosol+water
Fire Safety	IP55
Ingress Rating	Chiller+liquid cooling
Cooling	≤2,000m (derating above 2,000m)
Altitude	6,058*2,550*2,896 (mm)
Dimensions (W*D*H)	Cell: IEC 62619, UL9540A, UN38.3, UL1973
Compliance	Pack: UN38.3, IEC62477, IEC61000, IEC62619, IEC63056 System: IEC62477, IEC61000, IEC62619, IEC63056, UL9540A, UN3536, EN50549

