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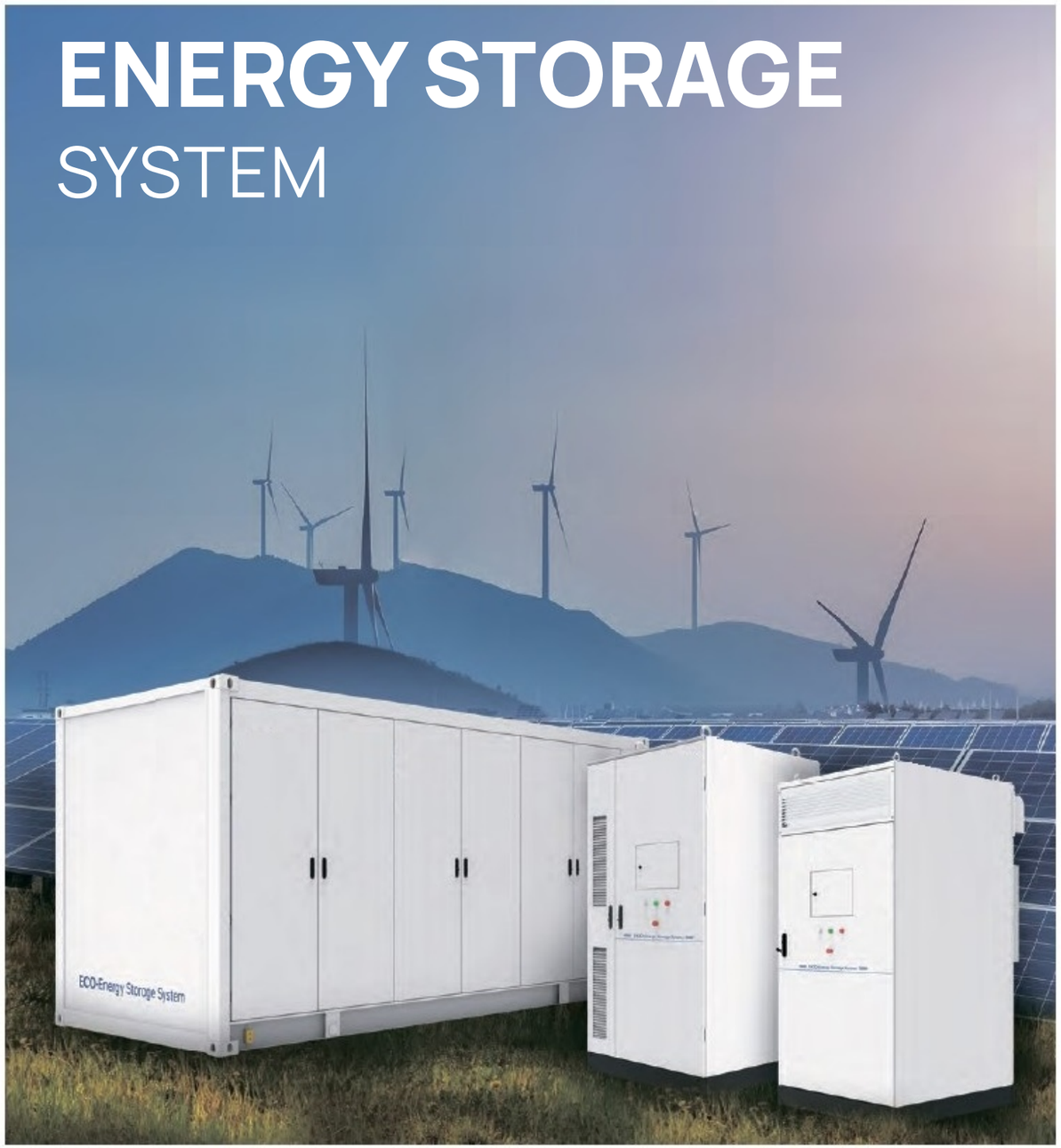
# ENERGY STORAGE
## SYSTEM



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# ESS Scenarios

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

① Industrial Parks

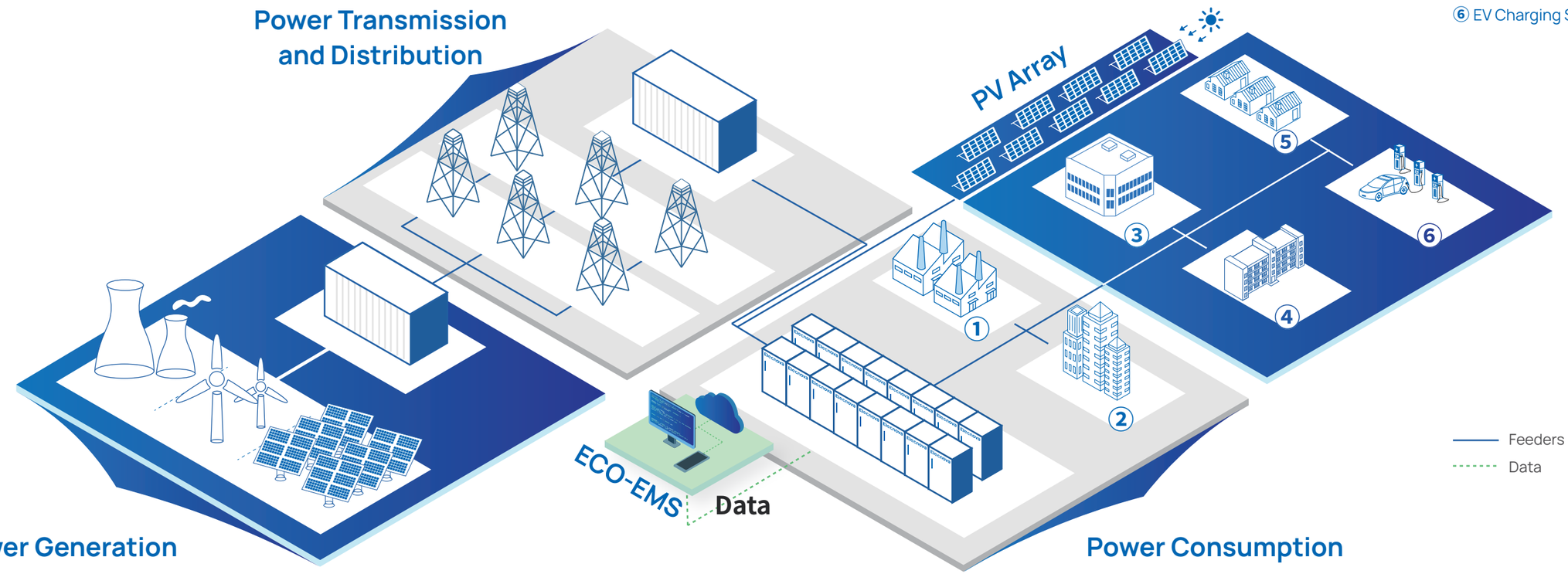
② Commercial Buildings

③ Data Centres

④ Utility Facilities

⑤ Dwellings

⑥ EV Charging Stations




Energy Arbitrage

Power Quality Optimisation

Power Market Ancillary Services

Backup Power Supply

Microgrid

VPP

# ESS Scenarios

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

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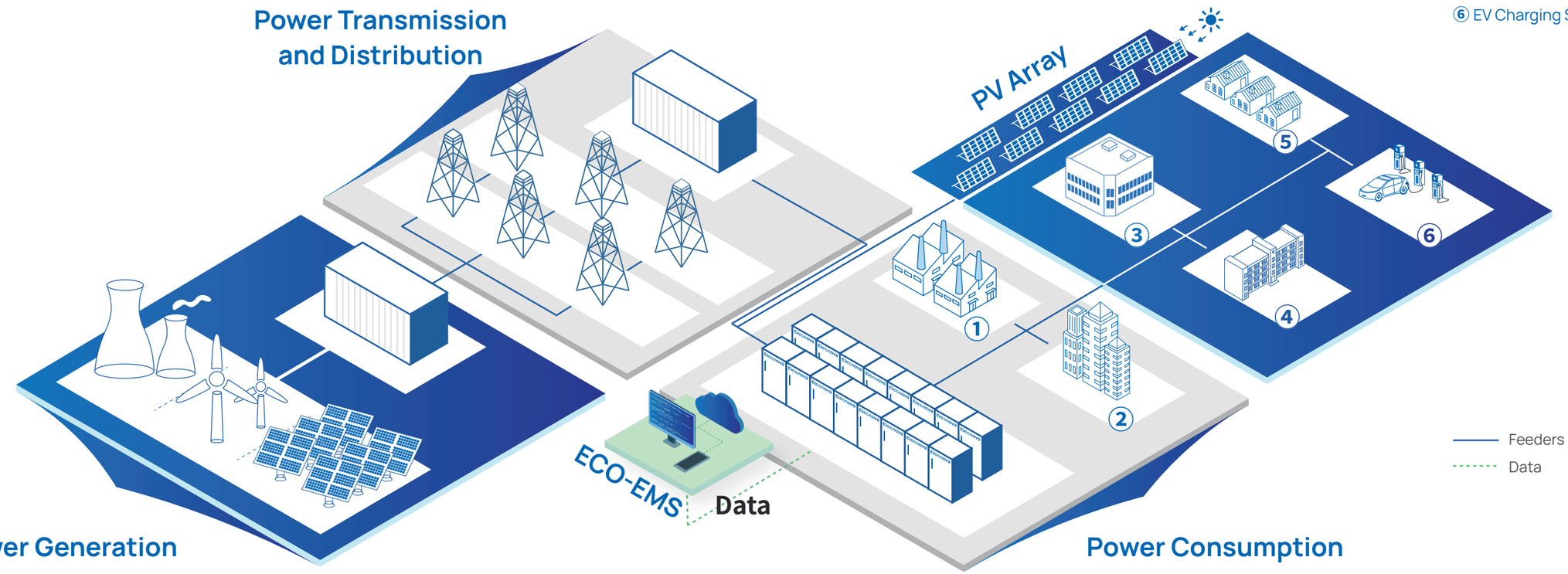


Energy Arbitrage

Power Quality Optimisation

Power Market Ancillary Services

Backup Power Supply

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VPP

# All-in-one Air-cooled ESS Cabinet

ECO-E215WS

## Brief

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.

## Features

**Economical and Efficient**
Conversion efficiency over 90%,
DoD over 95%.

**Safe & Reliable**
IP55 protection level, optimized ventilation design,
cells temperature difference ≤6°C.

**Compact**
1.6m² footprint only,
easy transportation & fast installation.

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

**Flexible Expansion**
Modular design, simplified parallel expansion,
fast expansion.

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



## Specifications

| DC Side | |
|---|---|
| Cell Type | LFP 280Ah |
| PACK | 17.92kWh/1P20S |
| Battery System | 215kWh/1P240S |
| Voltage Range | 672~864Vdc |
| Rated Voltage | 768Vdc |

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

| General | |
|---|---|
| Efficiency | ≥90% |
| Charge/Discharge Rate | 0.5P |
| DoD | 95% (25±2°C) |
| Cycle Life | ≥8,000 times |
| Switching Time | ＜100ms |
| Connectivity | Ethernet /RS485 |
| Ingress Rating | IP55 |
| Cooling | Forced air cooling |
| Operating Temperature | -25°C~55°C |
| Humidity | 0-95%RH, non-condensing |
| Noise | 80dB |
| Altitude | ≤2,000m (derating above 2,000m) |
| Fire Safety | Aerosol |
| Dimensions (W*D*H) | 1,250*1,300*2,400 (mm) |
| Weight | 2,630kg |
| Compliance | UN38.3, IEC62477, IEC61000, IEC62619, IEC63056, UL9540A, EN50549 |

# All-in-one Liquid-cooled ESS Cabinet

ECO-E233LS

## Brief

The all-in-one liquid-cooled ESS cabinet adopts advanced cabinet-level liquid cooling and temperature balancing strategy. The cell temperature difference is less than 3°C, which further improves the consistency of cell temperature and extends the battery life. The modular design makes the parallel solution more flexible and has higher energy density, which significantly improves the economy, safety and construction convenience of ESS projects.

## Features

**Compact**
1.4m² footprint only, easy transportation & fast installation.

**High Integration**
233kWh energy in one cabinet with remarkable endurance.

**Efficient Cooling**
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 fire warning and protection with NOVEC1230/aerosol, prevent heat diffusion and runaway.



## Specifications

| | |
|---|---|
| **DC Side** | |
| Cell Type | LFP280Ah |
| PACK | 46.592kWh/1P52S |
| Battery System | 233.96kWh/1P260S |
| Voltage Range | 728~936Vdc |
| PACK Ingress Rating | IP65 |
| **AC Side** | |
| Rated Power | 100kW |
| Max. Power | 110kW |
| THDi | ≤3% |
| DC Ratio | ＜0.5%Ipn |
| Nominal Voltage | 400Vac/3P+N+PE |
| Power Factor | -1 lagging~1 leading |
| Nominal Frequency | 50Hz/60Hz |
| **General** | |
| System Efficiency | ≥90% |
| Charge/Discharge Rate | 0.5P |
| DoD | 95%（25±2°C） |
| SOC Accuracy | ＜3% |
| Cycle Life | ≥8,000 times |
| Switching Time | ＜100ms |
| Connectivity | Ethernet /RS485 |
| Ingress Rating | IP55 |
| Cooling | Active 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 | NOVEC1230/aerosol |
| Dimensions (W*D*H) | 1,050*1,350*2,400 (mm) |
| Weight | 2570kg |
| Compliance | UN38.3, IEC62477, IEC61000, IEC62619, IEC63056, UL9540A, EN50549 |

# All-in-one Air-cooled ESS Cabinet

ECO-E100WX

## Brief

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.

## Features

**Fast response**
1P fast charge/discharge rate.

**Energy Saving**
Achieve utilization of new energy via energy storing & releasing of renewables.

**Economical & Efficient**
Conversion efficiency over 90%, DoD over 95%.

**Smart O&M**
Diversified access of monitoring by HMI (local), APP/web (remote).

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

**Safe & Reliable**
IP55, fully tested and optimized thermal management, cell difference ≤6°C.



## Specifications

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

| AC Side | |
|---|---|
| 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 |

| General | |
|---|---|
| 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*2,150 (mm) |
| Weight | 2,000kg |
| Fire Safety | Aerosol |
| Connectivity | Ethernet /RS485 |
| Compliance | UN38.3, IEC62477, IEC61000, IEC62619, IEC63056, UL9540A, EN50549 |

# Liquid-cooled Battery Cabinet

ECO-B372LS

## Brief

The liquid-cooled battery cabinet adopts advanced cabinet-level liquid cooling and temperature balancing strategy. The cell temperature difference is less than 3°C, which further improves the consistency of cell temperature and extends the battery life. The modular design makes the parallel solution more flexible and can be combined with the centralized PCS to form an ESS with higher energy density, which significantly improves the economy, safety and construction convenience of ESS projects.

## Features

**Compact**
1.7㎡ footprint only, easy transportation & fast installation.

**High Integration**
Multiple units connected in parallel achieve MV/HV connection with PCS-boost containers.

**Efficient Cooling**
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**
Support seamless cabinets combination and flexible grid access

**Ultimate Safety**
In-PACK fire warning and protection with NOVEC1230/aerosol, prevent heat diffusion and runaway.



## Specifications

| Item | Specification |
|---|---|
| Configuration | 1P416S |
| Rated Energy | 372kWh |
| Rated Voltage | 1331.2Vdc |
| DC Voltage Range | 1165~1498Vdc |
| PACK Ingress Rating | IP65 |
| Rated Charge/Discharge Rate | 0.5C |
| Operating Temperature | -25℃~55℃ |
| Fire Safety | NOVEC1230/aerosol |
| Ingress Rating | IP55 |
| Cooling | Liquid cooling |
| Altitude | ≤2,000m (derating above 2,000m) |
| Dimensions (W*D*H) | 1,300*1,300*2,400 (mm) |
| Weight | 3,660kg |
| Compliance | UN38.3, IEC62477, IEC61000, IEC62619, IEC63056, UL9540A, EN50549 |

# Liquid-cooled Battery Container

ECO-B20FT4472LS


## Brief

The 20-ft liquid-cooled ESS container product integrates PACK, EMS, BMS, HVAC, fire safety system into one container. Compared with the air cooling, the liquid cooling empowers the ESS product with higher power density and ensures the cell temperature difference less than 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.

## Features

**Higher Energy Density**
The 20-foot liquid-cooled energy storage container has a maximum capacity of 4.472MWh, 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 cell temperature consistency extends the battery service life by 5% and enhances the safety of batteries, and increases returns.

**Better Temperature Control**
In comparison to air cooling, the liquid cooling scheme keeps cell temperature difference less than 3°C, which improves cell voltage consistency.

**Higher Protection**
The product utilizes the IP55 (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 |
| Rated Charge/Discharge Rate | 0.5P |
| Operating Temperature | -25°C~55°C |
| Fire Safety | NOVEC1230/aerosol+water |
| Ingress Rating | IP55 |
| Cooling | Chiller+liquid cooling |
| Altitude | ≤2,000m (derating above 2,000m) |
| Dimensions (W*D*H) | 6,058 mm x 2,550mm x 2,896 mm |
| Compliance | Pack: UN38.3, IEC62477, IEC61000, IEC62619, IEC63056<br>System: IEC62477, IEC61000, IEC62619, IEC63056, UL9540A, UN3536, EN50549 |

# Liquid-cooled Battery Container

ECO-B20FT5015LP


## Brief

The 20-ft liquid-cooled ESS container product integrates PACK, EMS, BMS, HVAC, fire safety system into one container. Compared with the air cooling, the liquid cooling empowers the ESS product with higher power density and ensures the cell temperature difference less than 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.

## Features

**Higher Energy Density**
The 20-foot liquid-cooled energy storage container has a maximum capacity of 5.015MWh, 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 cell temperature consistency extends the battery service life by 5% and enhances the safety of batteries, and increases returns.

**Better Temperature Control**
In comparison to air cooling, the liquid cooling scheme keeps cell temperature difference less than 3°C, which improves cell voltage consistency.

**Higher Protection**
The product utilizes the IP55 (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 | 1165-1498Vdc |
| PACK Ingress Rating | IP65 |
| Rated Charge/Discharge Rate | 0.5P |
| Operating Temperature | -25°C~55°C |
| Fire Safety | NOVEC1230/aerosol+water |
| Ingress Rating | IP55 |
| Cooling | Chiller+liquid cooling |
| Altitude | ≤2,000m (derating above 2,000m) |
| Dimensions (W*D*H) | 6,058 mm x 2,550mm x 2,896 mm |
| Compliance | Pack: UN38.3, IEC62477, IEC61000, IEC62619, IEC63056<br>System: IEC62477, IEC61000, IEC62619, IEC63056, UL9540A, UN3536, EN50549 |

# Air-cooled Battery Container

ECO-B20FT3404WS


## Brief

The 20-ft air-cooled ESS container product integrates PACK, EMS, BMS, HVAC, fire safety system into one container. It has the advantages of high energy density, easy transportation & installation, and high protection level. The DC output can combine with PCS-boost container to realize AC network connection at medium/high voltage . It can be applied to the generation side, grid side, and ESS applications with high power/capacity requirements.

## Features

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

**Economical & Efficient**
Low system cost, high charge/discharge efficiency, support various ESS applications

**Smart Cooling**
Smart cooling ensures temperature difference not over 8°C.

**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

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

## Specifications

| Item | Specification |
|---|---|
| Configuration | 10P380S |
| Rated Energy | 3.404MWh |
| Rated Voltage | 1216Vdc |
| Voltage Range | 1064~1368Vdc |
| Nominal Charge/Discharge Rate | 0.5P |
| 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 mm x 2,438mm x 3,100mm |
| Compliance | Pack: UN38.3, IEC62477, IEC61000, IEC62619, IEC63056<br>System: IEC62477, IEC61000, IEC62619, IEC63056, UL9540A, UN3536, EN50549 |

# PCS-Boost Container

ECO-H3200K

## Brief

In order to meet the modular, integrated and convenient design needs of large-scale ESS stations, the all-in-one PCS-Boost container prefabricates the PCS, boost transformer, HV & LV power distribution unit, communication unit, etc. in one container, to achieve the fast construction of ESS stations. It has a virtual synchronization function and assures quality and stability for regional power distribution.

## Features

**Fast Delivery**
Prefabrication & all-in-one design, high system integration, easy transportation and installation.

**Ultra Bearing**
Wide DC voltage range, Full load capacity at DC1500V.

**Multi-level Protection**
Supports charge/discharge management, and cooperates with EMS, BMS and other systems to achieve multi-level protection.

**Swift Scheduling**
Excellent functions such as fast power scheduling, off-grid operation and black start to improve energy efficiency.

**Ultimate Safety**
Whole-unit intelligent forced air cooling & high protection, adaptable to various harsh environments.

**On-demand Customization**
On-demand customization according to power and structural requirements to meet customized needs.

## Specifications

| Model | Item | ECO-H3200K-G6-35 |
|---|---|---|
| DC side | Max. Voltage | 1500Vdc |
| | Max. Power | 200kW*16 |
| | Max. Current | 200A*16 |
| | Voltage Range | 1000-1500Vdc |
| AC Side | Rated Power | 3200kW |
| | Max. Power | 3520kW |
| | Nominal Voltage | 6-35kV optional |
| | Rated Frequency | 50Hz/60Hz |
| | THD | <1.5% @rated power |
| | Power Factor | -1 lagging~1 leading |
| General | Isolation | dry/oil transformer |
| | Max. Efficiency | 98% |
| | Ingress Rating | IP54 |
| | Operating Temperature | -40℃~60℃ |
| | Altitude | 4000m(derating above 4000m) |
| | Cooling | Smart air cooling |
| | Connectivity | RS485/CAN/Ethernet |
| | Dimensions (W*D*H) | 6058*2438*2591mm |

# Air-Cooled PACK

ECO-P1P20WS

## Brief

The air-cooled PACK consists of LFP cells, grouping in 1P20S. With built-in BMU, HV connectors, fans, and fixed structural components, these accessories enable the PACK module to have protection functions such as overvoltage, undervoltage, overcurrent, insulation, short circuit, and overheat. Combined with PCS, it achieves energy charge and discharge. This PACK is compatible with 1500V platform.

## Features

**Excellent Performance**
Laser welding for excellent cells consistency and superior charging/discharging performance.

**Long Cycle Life**
Over 8,000 times cycle life and a designed lifespan up to 10 years.

**Safe and Reliable**
Optimized ventilation system, active thermal management system.

**Flexible Configuration**
Standard & modular design, on-demand flexible expansion.

## Specifications

| ECO-P1P20WS | |
|---|---|
| Cell Type | LFP |
| Rated Capacity | 280Ah |
| Grouping | 1P20S |
| Rated Energy | 17.92kWh (rated conditions) |
| Rated Voltage | 64Vdc |
| Recommended Operating Voltage | 56-72Vdc |
| Rated Charge/Discharge Rate | 0.5C |
| Cooling | Air cooling |
| Cycle Life | ≥8,000 times |
| Storage Environment | 0~35℃, RH<75%(non-condensing) |
| Operating Temperature | -20℃~50℃ (discharging)/0~55℃(charging) |
| Ingress Rating | IP20 |
| Dimensions (W*D*H) | 470*950*230mm |
| Weight | 143kg |
| Compliance | UN38.3, IEC62619, IEC63056 |

# Liquid-Cooled PACK

ECO-P1P52LS

## Brief

The liquid-cooled PACK consists of LFP cells, grouping in 1P52S. With built-in BMU, HV connectors, liquid cooling module, fixed structural components , these accessories enable the PACK module to have protection functions such as overvoltage, undervoltage, overcurrent, insulation, short circuit, and overheat. Working together with PCS, it enables charge/discharge operation.

## Features

**Excellent Performance**
Laser welding for excellent cells consistency and superior charging/discharging performance.

**High Integration**
High energy density, built-in BMU monitoring the cell status in real-time

**Safe and reliable**
The cells temperature difference less than 3°C.

**Flexible Configuration**
Standard & modular design, on-demand flexible expansion.

**Long Cycle Life**
Over 8,000 times cycle life and a designed lifespan up to 10 years.

**Advanced Protection**
IP65 protection level, meeting various scenarios.

## Specifications

| ECO-P1P52LSP | |
|---|---|
| Cell Type | LFP |
| Rated Capacity | 280Ah |
| Grouping | 1P52S |
| Rated Energy | 46.592kWh (rated conditions) |
| Rated Voltage | 166.4Vdc |
| Recommended Operating Voltage | 145.6-187.2Vdc |
| Rated Charge/Discharge Rate | 0.5C |
| Cooling | Liquid cooling |
| Cycle Life | ≥8,000 times |
| Storage Environment | 0~35℃， RH＜75%(non-condensing) |
| Operating Temperature | -20℃~50℃(discharging)/0~55℃(charging) |
| Ingress Rating | IP65 |
| Dimensions (W*D*H) | 812*1132*238mm |
| Weight | 342kg |
| Compliance | UN38.3, IEC62619, IEC63056 |

# Battery Management System (ECO-BMS)

## Brief

BMS supports two architectures: three-level architecture (BMU+BCU+BAU) and two-level architecture (BMU+BCU). BMU, BCU and BAU respectively offer PACK-level, cluster-level and array-level protection against overcharging, over-discharging, overcurrent, overheat and short circuit for battery clusters. Real-time monitoring of battery safety status, fault diagnosis, and warnings are provided. The main control unit within the cluster can accurately estimate SOC/SOH (State of Charge/State of Health) and offers insulation detection function with precision requirements exceeding national standards, ensuring efficient, reliable and safe operation of the energy storage system.

## Features

**Complete Architecture**
Compatible with two-/three-level architectures, support distributed and centralized scenarios.

**High-Precision Insulation Estimation**
Flexible insulation diagnosis solution, compatible with two-/three-level architectures with high accuracy.

**Multiple Interfaces**
Multiple types of DI/DO interfaces, adaptive to status input and control of various equipment.

**Various Applications**
Supports air-/liquid-cooled scenarios.

**Protocol Compatible**
Support multiple PCS protocols.

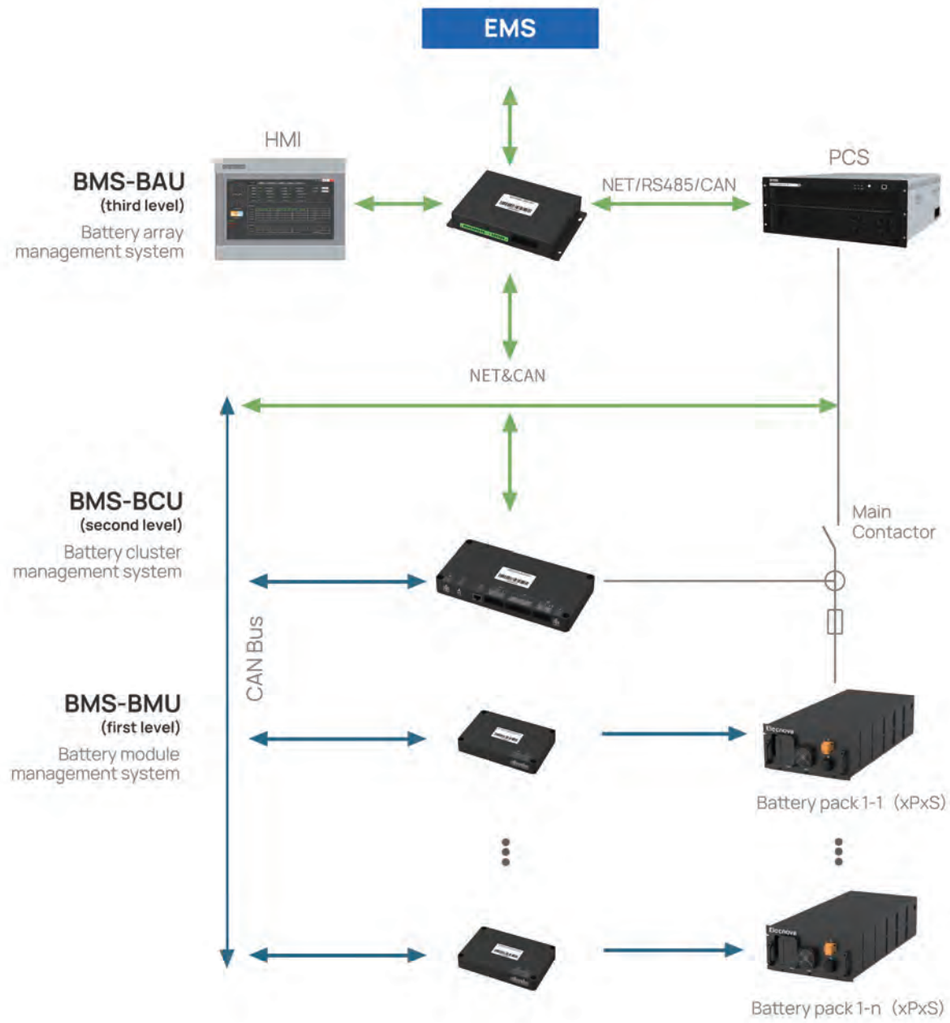
**SOC Estimation Accuracy**
Error < 5%

**Ultra-Low Consumption**
Flexible power supply and hibernation function.

**Real-Time Response**
100ms sampling interval to ensure timeliness of data.



Typical Architecture



# Specifications (Battery Module Unit BMU)

BMU-S24PB-A

BMU-S64PB-A

## Functions

- Acquisition of cell voltage
- Acquisition of cell temperature
- Passive balancing execution
- Liquid leakage monitoring
- Module fan feedback
- Module fan control

| Specifications | | Min. | Typical | Max. | | Unit |
|---|---|---|---|---|---|---|
| | | | | BMU-S24PB-A | BMU-S64PB-A | |
| Auxiliary Power Supply | Voltage | 9 | 12, 24 | 32 | | V |
| Operating Environment | Temperature | -25 | — | 65 | | ℃ |
| | Humidity | 5 | — | 95 | | % |
| Cell Voltage | Voltage Range | 0 | — | 5 | | V |
| | Sampling channel | — | — | 24 | 64 | mV |
| | Insulation Resistance | — | 100 | — | | MΩ |
| Voltage Resistance Insulation | Rated Operating Voltage | 1500 | | | | V |
| | Voltage Resistance | 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 | | ℃ |
| | Sampling Points | — | — | 24 | 64 | — |
| | Sampling Accuracy | — | 1 | — | | ℃ |
| Passive Balancing | Current | — | — | 100mA | | mA |
| DI/DO | DI | — | — | 2 | | Channel |
| | DO | — | — | 1 | | Channel |
| Signal Wiring | Wiring | — | — | Side connection | | — |



# Specifications (Battery Cluster Unit BCU)

## 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 | | Min. | Typical | Max. | Unit |
|---|---|---|---|---|---|
| Auxiliary Power Supply | Voltage | 9 | 12, 24 | 32 | V |
| Operating Environment | Temperature | -25 | — | 65 | ℃ |
| | Humidity | 5 | — | 95 | % |
| 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 |
| Voltage Resistance Insulation | Rated Operating Voltage | 1500 | | | V |
| | Voltage Resistance | 50Hz/3,000VAC applied between voltage sampling terminal and housing and digital interface terminal for 1 minute without breakdown or flashover | | | |
| AI | Voltage Range | 0 | — | 3.3 | V |
| | Temperature Sampling Accuracy | | ±1 | | ℃ |
| DI/DO | DI | | 3 | | Channel |
| | DO | | 8 | | Channel |
| SOC | Calculation Error | | 5 | | % |
| CAN | | | 3 | | Channel |
| RS485 | | | 3 | | Channel |
| Ethernet | | | 1 | | Channel |

# Specifications (Battery Array Unit BAU)

## 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 | | Min. | Typical | Max. | Unit |
|---|---|---|---|---|---|
| Auxiliary Power Supply | Voltage | 9 | 12, 24 | 32 | V |
| Operating Environment Quantity | Temperature | -25 | — | 65 | ℃ |
| | Relative Humidity | 5 | — | 95 | % |
| DI | High-level | 4 high-level effective inputs | | | — |
| | Low-level | 4 low-level effective inputs | | | — |
| Passive Dry Contact | Normally Open | 12 | | | Channel |
| | Normally Closed | 2 | | | Channel |
| CAN | | 3 | | | Channel |
| RS485 | | 5 | | | Channel |
| Ethernet | | 1 | | | Channel |



# Specifications (Human-machine Interface BMS-HMI)

| Product Model | ECO-BMS-HMI-7 | ECO-BMS-HMI-10 |
|---|---|---|
| LCD Screen | 7" TFT | 10" TFT |
| Resolution | 800×480 | 1024×600 |
| Memory | 128M | 128M |
| Interface | 2 channels serial interface,<br>2 channels USB Interface | 2 channels serial interface,<br>2 channels USB interface,<br>1 channel Ethernet interface |
| Power Supply | 24±20%Vdc | 24±20%Vdc |
| Overall Dimensions | 226mm×163mm | 271mm×213mm |
| Hole Dimensions | 215mm×152mm | 260mm×202mm |

# Power Conversion System (ECO-PCS)

## Brief

This product is a modular inverter specifically designed for small-scale ESS. It achieves bidirectional energy conversion in ESS and meets the requirements of various scenarios such as C&I ESS, microgrid energy storage, PV-plus ESS.


## Features

### Ultra-High Efficiency
GEN7 IGBT, three-level topology and minimal switch loss modulation method, conversion efficiency reaches up to 99%.

### Flexible Configuration
Modular design enables parallel expansion, can directly connect to LV distribution.

### Reliable
IP65 protection level, ms-level on-/off-grid switching.

### Versatile Applications
Extra-wide DC voltage input range, suitable for various battery types and scenarios.

### Unique Design
Adapt to single-/three-phase loads, active/reactive power control capabilities

### Excellent load-bearing
100% three-phase unbalanced loads, strong resistance to load fluctuations.



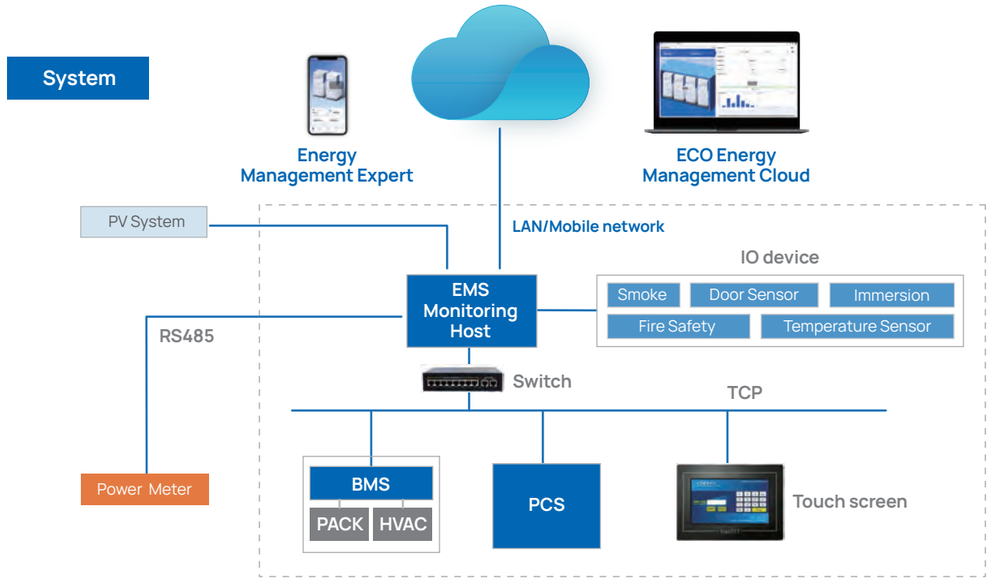
## Specifications

| DC Side | ECO-PCS-100/0.4-S | ECO-PCS-100/0.4-T |
|---|---|---|
| Voltage Range | 615~950Vdc | 615~950Vdc |
| Max. Current | 165A | 165A |
| Max. Voltage | 1000Vdc | 1000Vdc |
| Max. Power | 110kW | 110kW |
| **AC Side** | | |
| Rated Power | 100kW | 100kW |
| Max. Power | 110kW | 110kW |
| THDi | ＜3% | ＜3% |
| Wiring | 3P3W | 3P4W |
| Nominal Voltage | 400Vac | 400Vac |
| Power Factor | ＞0.99 | ＞0.99 |
| Power Factor Range | -1 lagging~1 leading | -1 lagging~1 leading |
| Nominal Frequency | 50Hz/60Hz | 50Hz/60Hz |
| **General** | | |
| System Efficiency | ≥98.5% | ≥98.5% |
| Switching Time | ≤52ms | ≤52ms |
| Connectivity | RS485/CAN | RS485/CAN |
| Ingress Rating | IP20 | IP20 |
| Cooling | Forced air cooling | Forced air cooling |
| Operating Temperature | -30~55℃ | -30~55 ℃ |
| Humidity | 5~95%RH(non-condensing) | 5~95%RH(non-condensing) |
| Dimensions (W*H*D) | 484*703*256(front/back connection)<br>544*717*271.5(circular connector) | |
| Weight | 47kg | 47kg |

# Energy Storage Management System (ECO-EMS)

## Brief

The ECO-EMS series products are integrated EMS designed for ESS scenarios, enabling real-time monitoring to meet the requirements of comprehensive operation monitoring, ensuring the safe, reliable, and cost-effective operation of ESS. Adopting an integrated architecture design, the system is suitable for user-side ESS, microgrid and PV-plus ESS and more. It ensures that the system operates optimally at all times, maximizing overall benefits and shortening ROI.




## Features

### Smart O&M
Support 4G network access to achieve intelligent O&M both on site and cloud.

### Stable and Reliable
Bus monitoring and bus wake-up, support the parallel operation of up to 10 integrated units, auto-networking, mutual backup operation between APP and nodes.

### Diverse Integration
Support real-time power control, load tracking, demand management, and charge/discharge planning strategies, integrate with distributed power generation equipment, support coordination control of PV-ESS, and distributed consumption and other operation modes.

### Self-adaptive Operation
Flexible arrangement of single-/dual-bus during parallel operation, identify the bus operation mode to achieve adaptive operation of multiple units, ensuring the safety of line operation.

## Functions

### System 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 sensors, and other devices.

### Peak Shaving
Adapt charge and discharge strategies to achieve energy arbitrage.

### Time Shifting
Intelligent prediction of new energy generation, maximizing the self-consumption utilisation of PV and reducing customer electricity costs.

### SOH Analysis
Collect data such as cell voltage, total current, SOC, and accurately assesses the battery's health status based on cloud.

### Intelligent Alarms
Various notification methods, help customers quickly address operational abnormalities and ensure reliable system operation.

### Demand Management
Smooth the electricity load through charge and discharge strategies, reduce peak power & maximum demand, and lower the customer's electricity cost.

### Remote O&M
Remote fault diagnosis and maintenance, reducing equipment downtime and safety risks, improving operation efficiency, and reducing maintenance costs, ensuring system stability.

### PV-ESS Coordination
Accurately predict electricity loads and intelligently control the output of PV generation and ESS, improving power supply reliability.

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