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—≡ AULANBEL ENERGY ≡—

## ABOUT AULANBEL

11

National Invention Patents

51

Utility Model Patents

10

Related qualifications and awards

Aulanbel is a national high-tech enterprise specializing in product R&D and system construction of the entire electrochemical energy storage industry chain, R&D, production and sales of EV chargers, construction and operation of EV charging stations, construction of battery-swap electric heavy-duty truck stations, R&D and sales of energy storage core control system (BMS), and comprehensive energy big data business in China.

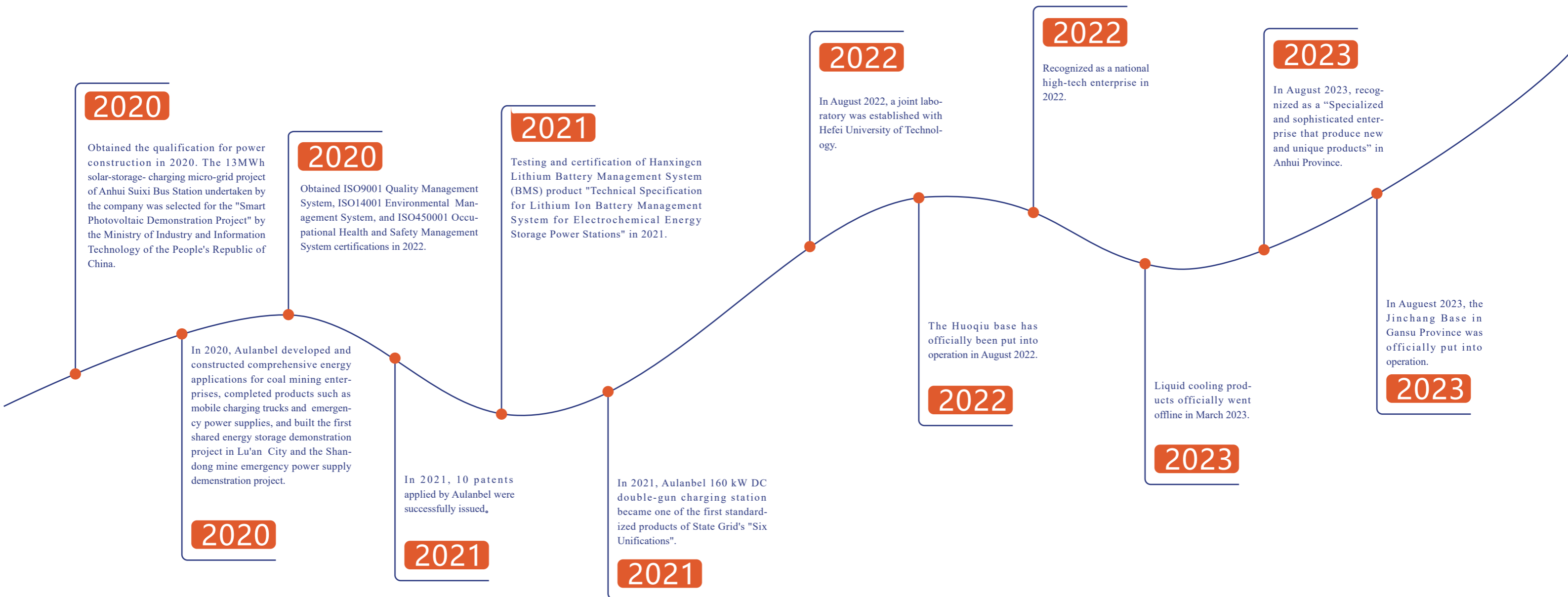
Aulanbel is headquartered in Hefei High-tech Zone Huoqiu Modern Industrial Park, and has strong comprehensive strength in R&D of storage and charging technology and system engineering construction. After years of exploration and pursuit, Aulanbel has formed a R&D and production pattern of "one center and three bases". It has two wholly-owned subsidiaries and two holding subsidiaries.

Aulanbel has a professional core technology R&D team, and has signed long-term industry-university-research agreements with colleges and universities, gaining strong support in technology and talents. The company has applied for and been authorized 11 national invention patents, 51 utility model patents, and won more than 10 related qualifications and awards, with many achievements leading the country and the industry.

Based on the two core businesses of "storage and charging technology R&D" and "storage and charging system engineering construction", Aulanbel has the domestic first-class core technology in the field of storage and charging and the qualification for general contracting of power engineering construction in China. It is a leading system supplier in the fields of energy storage, EV chargers, and BS electric heavy-duty trucks in China.

Learn more about Aulanbel by visiting [www.aulanbelenergy.com](http://www.aulanbelenergy.com).

# COMPANY MILESTONES



# TECHNICAL QUALIFICATIONS





# PRODUCT OVERVIEW

## Energy Storage System

**System Model:** XINGXI-5000-(1080-1460)

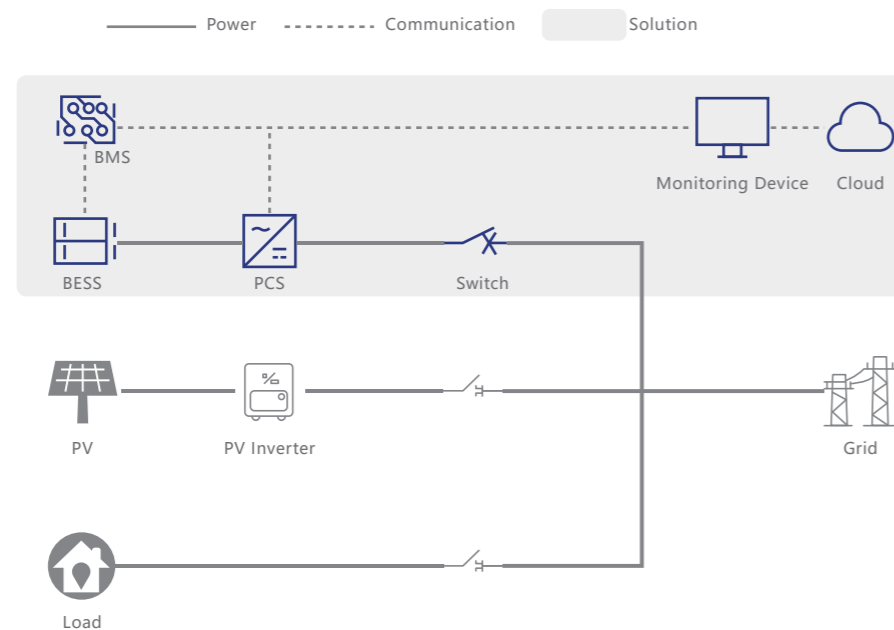
**Product Type:** 45ft 5MWh Containerized Battery Energy Storage System

**System Features:** Peak valley regulation, photovoltaic absorption, distribution power reduction, demand side response, and various grid auxiliary services.

- Product Features:**
- Supports 1500V DC voltage, with a comprehensive efficiency of over 86%
  - High-density, large-capacity ESS; high-safety LFP energy storage cells with up to 8000 cycles and a service life of over 15 years; reliable BMS, patented software algorithm to ensure reliable operation of equipment; modular design, easy installation and maintenance
  - Intelligent human-machine interface, real-time monitoring, easy to operate
  - Intelligent temperature control system, which is not affected by the external environment
  - Automatic security system, heptafluoropropane fire extinguishing, fully submerged, safe and reliable, quick response
  - Multi-functional local EMS, comprehensive energy complementary scheduling
  - Multi-terminal remote cloud server monitoring



**Topology Diagram:**



<b>Model</b>	<b>XINGXI-5000- (1080-1460)</b>
Nominal Energy	5017.6 kWh
Rated AC Power (via PCS)	1250 kW*2
Nominal Capacity	1960 Ah*2
Nominal DC Voltage	1280 V
DC Voltage Range	1080 V ~ 1460 V
Number of Racks	14
System Charge/Discharge Rate	0.5C
Operating Temperature Range	-30°C ~ 50°C
Cell Chemistry	Lithium iron phosphate (LiFePO4)
Dimensions (W × D × H)	13716×2438×2896 mm
Weight (Approx.)	55 T
Enclosure	45' HC container IP55
Max. Working Altitude	4000 m
Battery Temperature Control Method	Industrial grade air conditioning
Fire Fighting System	Heptafluoropropane fire fighting system
Communication Interface	Ethernet
Communication Protocol	ModbusRTU/Modbus TCP/IEC104
Standard	UN38.3, GB/T36276-2018

# PRODUCT OVERVIEW

## Energy Storage System

**System Model:** XINGHUI-3350- (1040-1497.6)

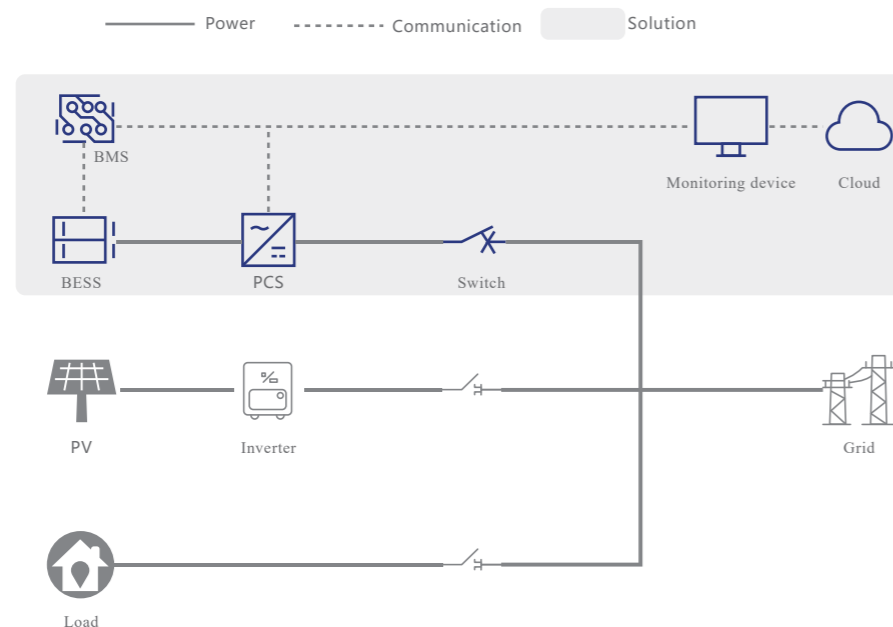
**Product Type:** 20ft 3.35MWh Liquid Cooling Energy Storage System

**System Features:** Peak valley regulation, photovoltaic absorption, distribution power reduction, demand side response, and various grid auxiliary services.

- Product Features:**
- High-safety LFP energy storage cells with up to 8000 cycles and a service life of over 15 years
  - Reliable BMS, patented software algorithm to ensure reliable operation of equipment
  - Air conditioner + liquid cooling temperature control system is adopted. The air conditioner is used for the temperature and humidity control and management of the cabin environment, and the liquid cooling temperature control system is used for battery temperature control; equipped with multiple fire safety protection systems, which realize the temperature monitoring of the battery level to the PACK level automatic fire extinguishing function
  - The whole cabin is equipped with a triple protection system of PACK level immersion fire extinguishing, full immersion perfluorohexanone fire extinguishing system, and fire sprinkler system.



Topology Diagram:



<b>Model</b>	<b>XINGHUI-3350- (1040-1497.6)</b>
Nominal Energy	3.35 MWh
Rated AC Power (via PCS)	1.72 MW
Usable Energy	3.35 MWh
Nominal Capacity	2520 Ah
Nominal DC Voltage	1331.2 V
DC Voltage Range	1040 V ~ 1497.6 V
System Charge/Discharge Rate	0.5P
Operating Temperature Range	-30°C ~ 50°C
Max. Working Altitude	4000 m
Cell Chemistry	Lithium iron phosphate (LiFePO4)
Number of Racks	9
Dimensions (W × D × H)	6058×2438×2896 mm
Weight (Approx.)	32 T
Enclosure	20' GP container IP55
Integration Requirements	Directly install the battery module to meet overall transportation needs
Fire Fighting System	Module level gas/water fire protection
Thermal Management System	Environmental temperature control 25 ± 5°C, maximum battery operating temperature ≤ 3°C, temperature difference ≤ 5°C
Battery Temperature Control Method	Forced liquid cooling
BMS	3-level framework for system control and passive balancing
Power consumption requirements	Standby loss requirement ≤300W, working energy consumption ≤80kWh/day 1 cycle

# PRODUCT OVERVIEW

## Commercial & Industry Energy Storage System

**System Model:** XINGXI-100/215-220/380

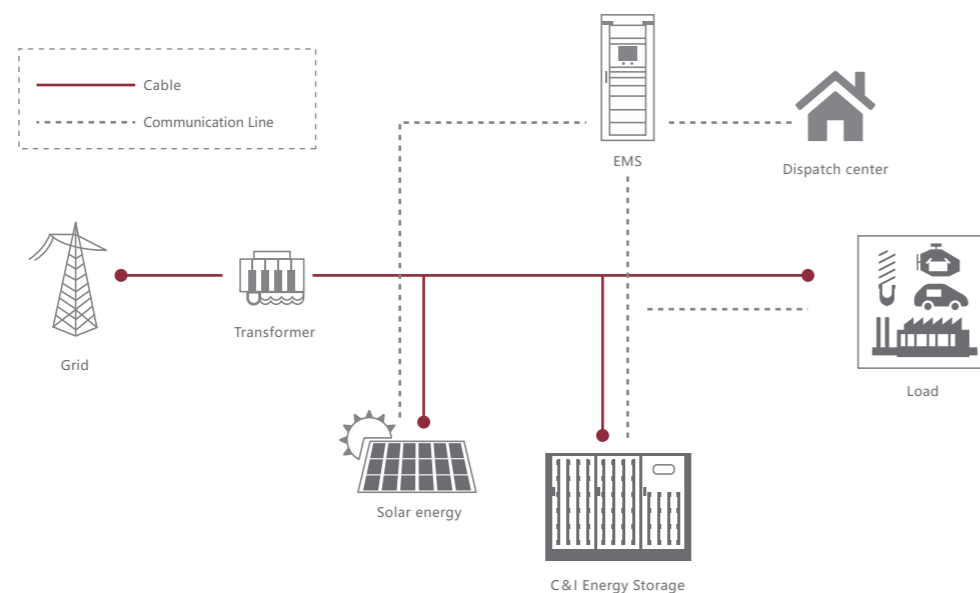
**Product Type:** 100kW/215kWh All-in-One Battery Energy Storage System

**Usage Scenario:** Outdoor cabinet energy storage system serves small industrial and commercial users, mainly suitable for various occasions such as power storage, backup power supply, peak load shifting, peak shaving, frequency regulation, and microgrids.

- Product Features:**
- Integrated with PCS, battery, BMS, EMS, thermal management, power distribution, fire protection, etc
  - Adopting a single string design to achieve zero capacitance loss in parallel connection
  - Integrated harmonic control, reactive power compensation, and three-phase imbalance control
  - Supporting multiple cabinets to be directly connected in parallel to achieve capacity expansion and plug-and-play of energy storage system
  - Using high-power air conditioning to dissipate heat



**Topology Diagram:**



<b>Model</b>	XINGXI-100/215-220/380
<b>Battery Data</b>	
Cell Type	3.2V 280Ah LiFePO4
Assembled Rack Configuration	240S1P
Nominal Energy	215.04 kWh
Nominal Capacity	280 Ah
Nominal Voltage	768V
Voltage Range	660V - 876V
BMS Communication Interfaces	RS485, Ethernet, CAN
BMS Communication Protocols	Modbus RTU, Modbus TCP, IEC61850
<b>AC Data</b>	
Rated AC Power	100 kW
Maximum Power	110 kW
Input/ Output Voltage AC	400V
Input/output Frequency	50Hz/60Hz±2.5Hz
Max Continuous Output Current	145A
Max. THDi	<3%
Grid	3P5W
Cooling Method	Air cooling
<b>General Data</b>	
Dimensions (W × D × H)	1704×1204×2632mm
Weight	2.8T
Degree of Protection	IP55
Operating Temperature Range	-30°C~55°C
Cooling Method	HVAC
Fire Suppression System of Battery Unit	Heptafluoropropane fire suppression system
Communication Interface	RS485, Ethernet, CAN
Communication Protocols	Modbus RTU, Modbus TCP, IEC61850

# PRODUCT OVERVIEW

## Commercial & Industry Energy Storage System

**System Model:** XINGHUI-100/233-220/380

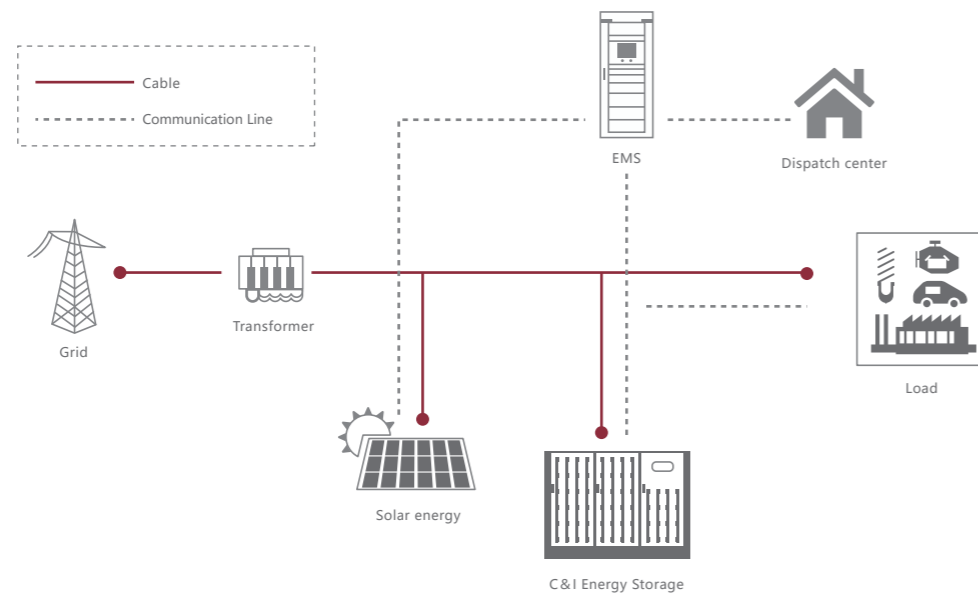
**Product Type:** 100kW/233kWh Liquid Cooling Commercial Energy Storage System

**Usage scenario:** Outdoor cabinet energy storage system serves small industrial and commercial users, mainly suitable for various occasions such as power storage, backup power supply, peak load shifting, peak shaving, frequency regulation, and microgrids.

- Product Features:**
- Integrated with PCS, battery, BMS, EMS, thermal management, power distribution, fire protection, etc
  - Adopting a single string design to achieve zero capacitance loss in parallel connection
  - Integrated harmonic control, reactive power compensation, and three-phase imbalance control
  - Supporting multiple cabinets to be directly connected in parallel to achieve capacity expansion and plug-and-play of energy storage system
  - Adopting high-reliability liquid cooling for heat dissipation and improving the protection level in a closed operating environment



**Topology Diagram:**



<b>Model</b>	XINGXI-100/233-220/380
<b>Battery Data</b>	
Cell Type	3.2V 280Ah LiFePO4
Assembled Rack Configuration	260S1P
Nominal Energy	232.96 kWh
Nominal Capacity	280 Ah
Nominal Voltage	832V
Voltage Range	676V - 949V
BMS Communication Interfaces	RS485, Ethernet, CAN
BMS Communication Protocols	Modbus RTU, Modbus TCP, IEC61850
<b>AC Data</b>	
Rated AC Power	100 kW
Maximum Power	110 kW
Input/ Output Voltage AC	400V
Input/output Frequency	50Hz/60Hz±2.5Hz
Max Continuous Output Current	145A
Max. THDi	<3%
Grid	3P5W
Cooling Method	Air cooling
<b>General Data</b>	
Dimensions (W × D × H)	1704×1204×2632mm
Weight	2.8T
Degree of Protection	IP55
Operating Temperature Range	-20°C~60°C
Cooling Method	Liquid cooling
Fire Suppression System of Battery Unit	Perfluorohexacone fire suppression system
Communication Interface	RS485, Ethernet, CAN
Communication Protocols	Modbus RTU, Modbus TCP, IEC61850



# PRODUCT OVERVIEW

## Residential Energy Storage System

**Series:** XINGXI-H

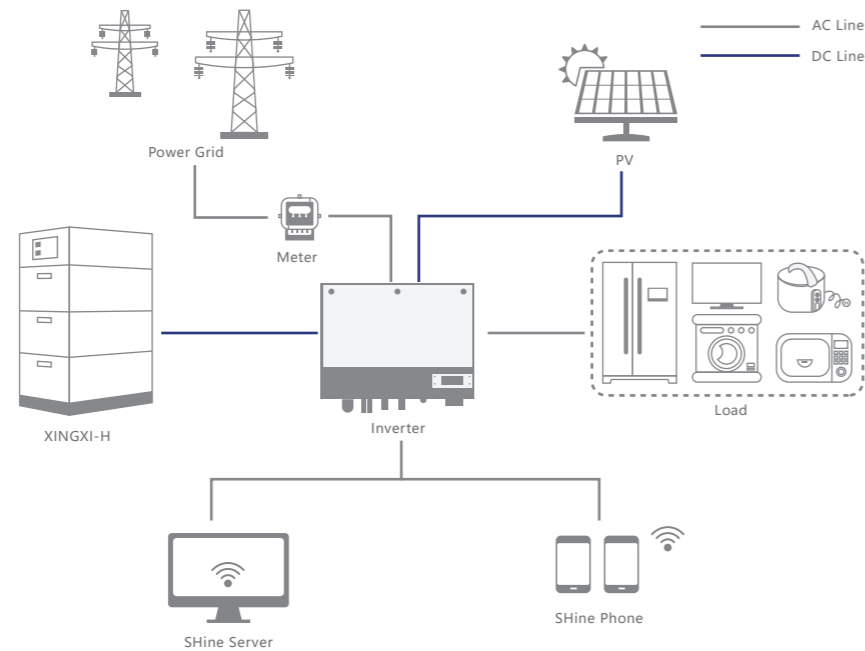
**Product Type:** High voltage residential energy storage battery

**System Features:** The XINGXI-H series works with the inverter to support the self-generation and self-use of PV energy, and greatly reduces the output of electricity charges through peak-to-valley power conversion. When the power grid is cut off, the off-grid mode is automatically switched, and the family realizes energy independence.

- Product Features:**
- Consists of independent stackable battery boxes and a high-voltage box
  - High conversion efficiency, seamless switching between grid-connected and off-grid mode within 100ms
  - Wide range battery voltage input supports large capacity grouping
  - Supports stacking of 2-5 battery boxes for easy expansion
  - Automatic module identification, real-time data monitoring, automatic restart under voltage



Topology Diagram:



	XINGXI-10-H	XINGXI-15-H	XINGXI-20-H	XINGXI-25-H
<b>System Data</b>				
Battery Type	LFP			
Battery Module	XINGXI-5000H; 102.4V 5.3kWh			
Number of Modules	2	3	4	5
Nominal Capacity	10.6 kWh	15.9 kWh	21.2 kWh	26.5 kWh
Nominal Voltage	204.8 V	307.2 V	409.6 V	512 V
Rated DC Power	5 kWh	7.5 kWh	10 kWh	12.5 kWh
Operating Voltage	182.4~230.4 V	273.6~345.6 V	364.8~460.8 V	456~576 V
Continuous Discharge Current	26A			
Communication	CAN			
<b>General Data</b>				
Weight	120 kg	172 kg	224 kg	276 kg
Dimensions (W×D×H)	666×354×796 mm	666×354×1078 mm	666×354×1360 mm	666×354×1641 mm
Operating Temperature	Charge: 0 °C < T ≤ 50 °C / Discharge: -20 °C < T ≤ 50 °C			
Humidity	≤95%			
Altitude	≤2000 m			
Degree of Protection	IP54 (outdoor / indoor)			
Mounting Method	Floor stand			
Certificates	UN38.3 / MSDS			

# PRODUCT OVERVIEW

## Residential Energy Storage System

**Series:** XINGXI-L

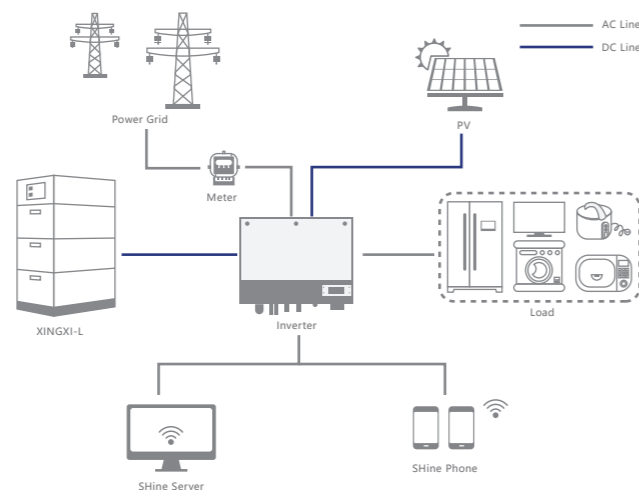
**Product Type:** Low voltage residential energy storage battery

**System Features:** XINGXI-L works with the inverter to support the self-generation and self-use of PV energy, and greatly reduces the output of electricity, charges through peak-to-valley power conversion. When the power grid is cut off, the off-grid mode is automatically switched, and the family realizes energy independence.

- Product Features:**
- High conversion efficiency, seamless switching between grid-connected and off-grid mode within 100ms
  - Wide range battery voltage input supports large capacity grouping
  - Supports stacking of 1-6 battery boxes for easy expansion
  - Automatic module identification, real-time data monitoring, automatic restart under voltage



**Topology Diagram:**



	XINGXI-5-L	XINGXI-10-L	XINGXI-15-L	XINGXI-20-L	XINGXI-25-L	XINGXI-30-L
Number of Modules	1	2	3	4	5	6
Nominal Capacity	5.12 kWh	10.24 kWh	15.36 kWh	20.48 kWh	25.6 kWh	30.72 kWh
Battery Type	LFP (LiFePO4) 100Ah					
Rated Charging/Discharging Current	66 A	97 A				
Rated Charging/Discharging Power	3 kW	5 kW				
Weight	44 kg	82 kg	120 kg	152 kg	190 kg	222 kg
Dimensions (W×D×H)	700×460×381 mm	700×460×698 mm	700×460×1015 mm	700×460×1332 mm	700×460×1649 mm	700×460×1996 mm
Nominal Voltage	51.2 V					
Operating Voltage	48 V ~ 57.6 V					
Operating Temperature	Charge: 0 °C < T ≤ 50 °C / Discharge: -10 °C < T ≤ 50 °C					
Short-circuit Current	2.323kA @ 1.0ms					
Communication	CAN/RS485					
Relative Humidity	0~95%					
Max. Operating Altitude	2000 m					
Enclosure Protection Rating	IP54					
Mounting Method	Floor stand					
Certificates	UN38.3 / MSDS					

# PRODUCT OVERVIEW

## Power Conversion System

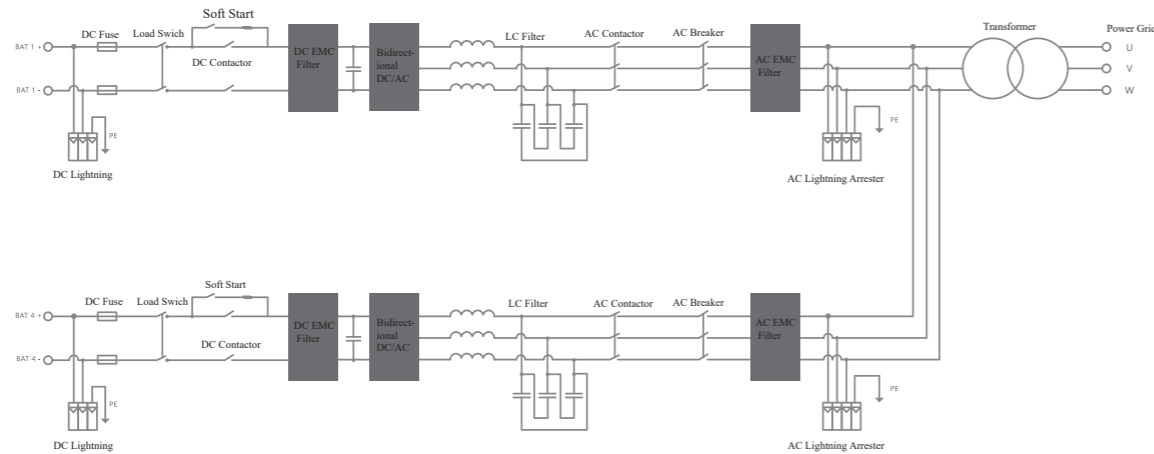
**System Model:** XINGXI-2500-35000(800-1500)

**Product Type:** Power Conversion System

- Product Features:**
- Inverter and boost integrated, compact structure
  - Standardized design, perfectly matching user power supply system
  - Multiple protection functions, integrated high-precision temperature and humidity monitoring system, safe and reliable
  - High-level protection, suitable for harsh outdoor environments
  - Preinstalled structure, convenient for transportation and installation



**Topology Diagram:**



Specification	Model	XINGXI-2500-35000/(800-1500)
Appearance structure	Product Name	2.5MW power conversion system
	Dimensions (W × D × H)	7000×3000×2896mm
	Inlet-outlet Line Mode	Down in and down out
	Estimated Weight	17T
	Maintenance Method	External maintenance
Electrical Specifications (Rated)	AC Side Grid-connected Voltage	37KV
	Rated Power	2500KVA
	DC Voltage	DC 1000~1500V
	DC Current	DC 2380A
	Input Frequency	50±5Hz
	Standby Power Consumption	≈ Transformer no-load power consumption + PCS standby powerconsumption + auxiliary power supply
Environmental Indicators	Applicable Environment	Outdoor
	Operating Temperature	-20~45°C
	Operating Humidity	0%~95% (non-condensing)
	Working Altitude	3000m
	Degree of Protection	IP54
	Cooling Method	AN/AF
	Special Protection	Anti-wind and sand, dust-proof customization
Functional Design	Protection Design	Short-circuit protection, transformer high temperature alarm, transformer over-temperature trip, high-voltage live locking function, fire shutdown protection, backup power supply, manhole, emergency escape door, etc.

# PRODUCT OVERVIEW

## Battery Module

- Features:**
- Simple structure and relatively low investment cost
  - Higher heat dissipation efficiency, able to meet the heat dissipation needs of high-power charging and discharging
  - Liquid cooling dissipates heat more evenly and has a small cell temperature difference, which is very helpful in enhancing the stability of the battery system and extending its lifespan.
  - Good safety, all-steel hard-shell structure, built-in fire detection and fire-extinguishing equipment, safe and reliable



<b>Model</b>	<b>HX-M466Y</b>
Cell Configuration	1P52S
Nominal Energy	46.592kWh
Nominal Capacity	280Ah
Nominal Voltage	166.4V
Operating Temperature Range	130 ~ 187.2 V
Cell Max. Continuous Charge & Discharge	0.5P
Cell Chemistry	Lithium Iron Phosphate (LiFePO4)
Liquid Cooled	Included
Dimensions (W × D × H)	1160×810×241 mm
Weight (Approx.)	336kg

## Battery Rack

- Features:**
- Simple structure and relatively low investment cost
  - Higher heat dissipation efficiency, able to meet the heat dissipation needs of high-power charging and discharging
  - Liquid cooling dissipates heat more evenly and has a small cell temperature difference, which is very helpful in enhancing the stability of the battery system and extending its lifespan.
  - Good safety, all-steel hard-shell structure, built-in fire detection and fire-extinguishing equipment, safe and reliable



<b>Model</b>	<b>HX-C373Y</b>
Cell Configuration	1P416S
Assembled Module Configuration	1P52S
Number of Modules per Rack	8
Nominal Energy	372.736 kWh
Nominal Capacity	280Ah
Nominal Voltage	1331.2 V
Voltage Range	1040 V ~ 1497.6 V
Max. Continuous Charge	280 A @ 0.5P
Max. Continuous Discharge	280 A @ 0.5P
Dimensions (W × D × H)	826×2220×2620 mm
Operating Temperature Range	-20°C ~ 50°C
Storage Temperature Range	-35°C ~ 60°C
Humidity	60±25% R.H
Key Components	Liquid cooled plug-in box



# PRODUCT OVERVIEW

## BMS

- Product Features:**
- Monitor battery voltage to avoid overcharge, over-discharge and other abnormal conditions
  - Balance battery voltage, improve power utilization and extend battery life
  - Monitor battery temperature, extend battery life, and protect battery safety
  - When an abnormality occurs, cut off the connection between the battery pack and the load to ensure safety



<b>Model</b>	<b>XINGXI-BMS-3-1500</b>	
Voltage Level	1500VDC	
Supply Voltage	24V±10% or self-powered	
Isolation Voltage	3000VDC	
Balanced Approach	Passive Equilibrium	
SOE/SOC Accuracy	< 3%FS	
Voltage Acquisition Accuracy	0.1% FS+0.1% RD	
Current Acquisition Accuracy	< 0.5% FS	
Communication Interface	External communication	Internal communication
	Modbus	CAN/LAN
Operating Temperature	-20°C ~ 60°C	
Storage Temperature	-30°C ~ 70°C	
Operating/Storage Humidity	10%~90%	Frost free
Voltage Detection Channel	16	
Temperature Detection Channel	8	

## EMS

### Overview

#### SMART

Equipped with intelligent scheduling, data analysis, risk warning and other functions, it can automatically select the optimal charging and discharging strategy to improve the utilization efficiency of energy storage systems.

#### HIGH RELIABILITY

Having real-time monitoring and fault detection functions to handle faults in the energy storage system in a timely manner to ensure stable operation of the system

#### STRONG FLEXIBILITY

Flexible adjustments can be made based on various factors such as power grid load, weather conditions, and user needs to improve the response capability of energy storage systems.

#### EASY TO SCALABLE

Can be expanded according to the expansion needs of the energy storage system, and supports multiple interfaces and protocols, making it easy to integrate with other systems.



### Function

The Energy Management System (EMS) uniformly coordinates and controls each equipment in the energy storage complete set project, while managing and statistically analyzing the charging and discharging and the each components of the energy storage system (ESS), regulating and controlling them, and collecting relevant operating parameters. It can support power grid dispatching and provide active and reactive power support according to dispatching instructions.

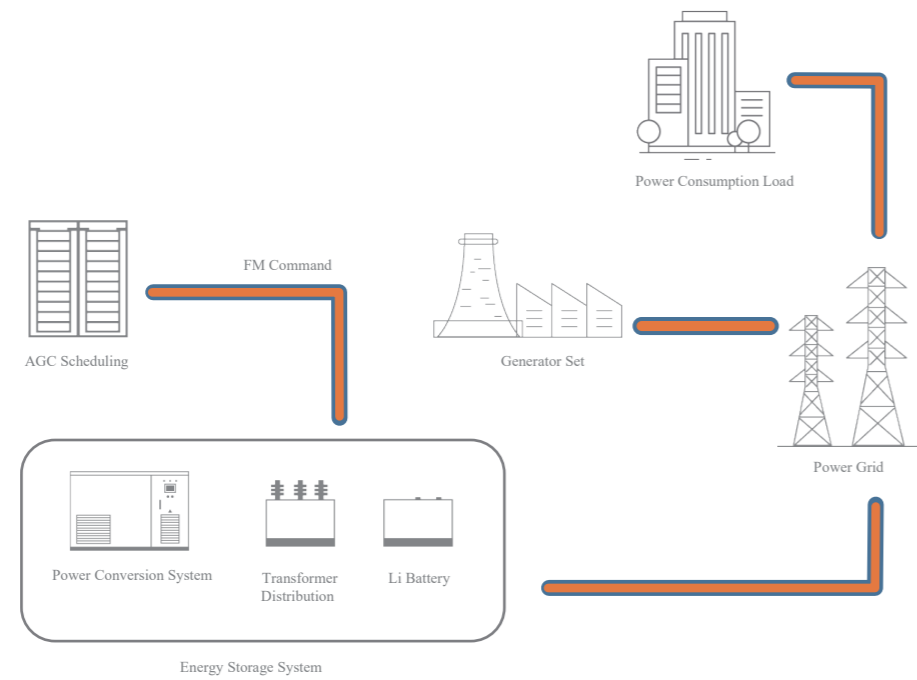
The EMS consists of four parts: energy storage monitoring system, coordinated control system, energy management system, and precise load shedding system.

The EMS includes a coordination controller, which is mainly used to coordinate and control multiple PCSs to achieve advanced control functions, such as fast power tracking response, auxiliary frequency regulation, and voltage regulation, to achieve the following main functions:

- **Dual-machine switching function:** The host and backup states support remote setting, manual switching, and automatic switching.
- **Active power control:** Supports primary frequency modulation control and constant active power control.
- **Reactive power control:** Supports dynamic voltage regulation control, constant power factor control, and constant reactive power control.
- **AGC/AVC command forwarding:** According to the AGC/AVC command, the active power and reactive power target values are delivered to each PCS through the MMS and energy storage coordination controller.

# SOLUTION

## Peak Shaving and Frequency Regulation Energy Storage on Power Generation



### Peak Shaving and Frequency Regulation Solution on Power Generation

#### Scenario Description

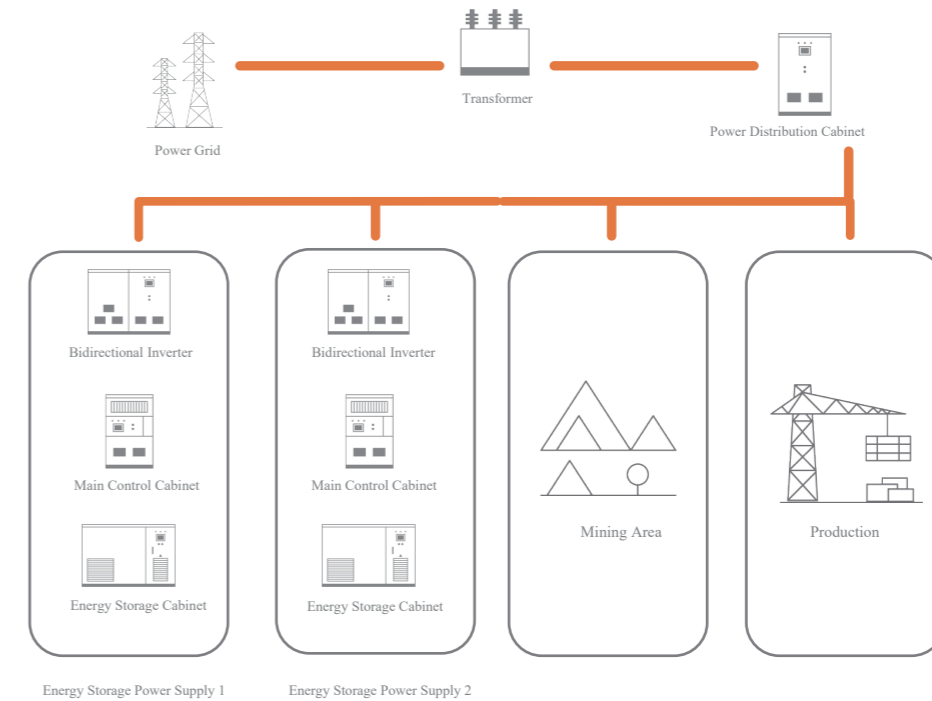
By using self-learning intelligent algorithms to achieve optimal response strategies, optimal power allocation, and unit self-balancing, achieving high real-time and high-precision response to AGC frequency regulation instructions can significantly improve the frequency regulation response capability of thermal power generation units, helping power plant users obtain optimal revenue from power generation auxiliary services.

#### Solution Features

- Intelligent algorithm implementation of optimal response strategy
- Optimal power allocation and unit self-balancing
- Realize high real-time and high-precision response to AGC frequency modulation commands

# SOLUTION

## Security Emergency Power Supply



### Mining Security Power Supply Solution

#### Scenario Description

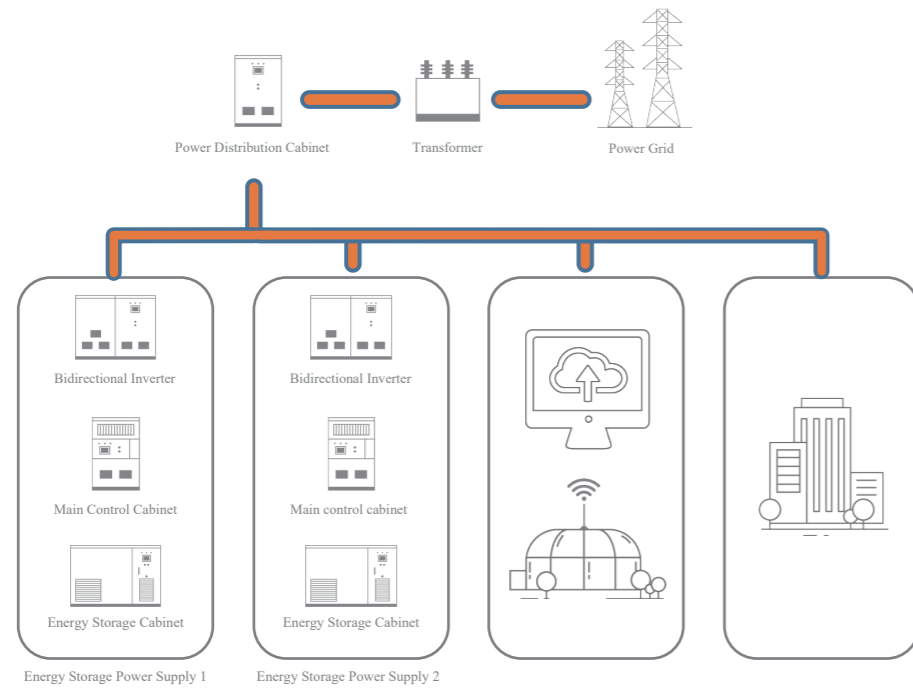
Classify load types according to the power consumption characteristics of mining enterprises, carry out power distribution transformation for important loads, and provide energy storage system security emergency power supply solutions. When there is a sudden power outage in the power grid or a failure of the mine power supply system, the energy storage system Millisecond-level response switches to emergency mode to achieve uninterrupted power supply, building a solid barrier for safe production in the mining area.

#### Solution Features

- Effectively utilizing various energy sources and saving electricity costs
- Can realize power quality control as backup power supply

# SOLUTION

## Commercial & Industrial Energy Storage Solution



### Commercial & Industrial Energy Storage Solution

#### Scenario Description

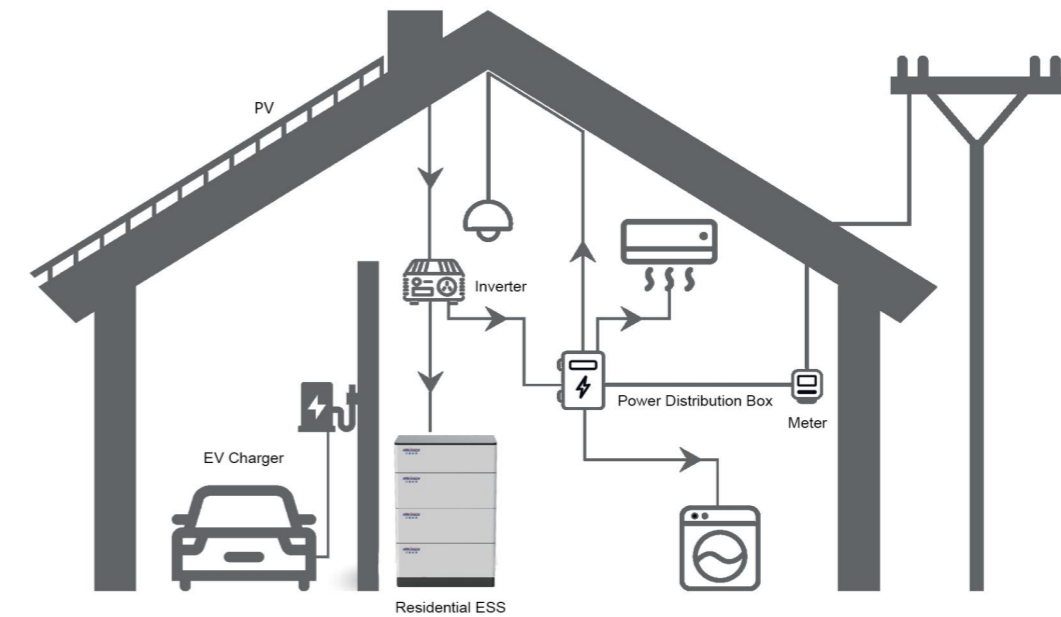
Since the transformation of the power distribution capacity of commercial complexes is restricted by the upper-level power distribution capacity, capacity expansion is difficult, and the power expansion investment is large, the cycle is long, and the comprehensive benefits are poor. How to find the optimal solution to solve problems such as insufficient power distribution capacity, large peak-to-valley differences in power consumption, and deterioration of power quality in large commercial complexes has become the focus of attention.

#### Solution Features

- Intelligent optimization of electricity consumption and optimization of power distribution capacity
- Effectively improving electricity efficiency and quality
- High system integration and small footprint
- Adopting modular design for convenient expansion

# SOLUTION

## Residential Energy Storage Solution



Schematic Diagram of Residential Energy Storage System

### Residential Energy Storage Solution

#### Scenario Description

Photovoltaic power generation is used to power household appliances during the day, and the energy storage system is used to power household appliances at night, effectively reducing users' dependence on the power grid and reducing electricity expenditures. In addition, it can be used as a backup power supply for households to cope with grid failures and power outages.

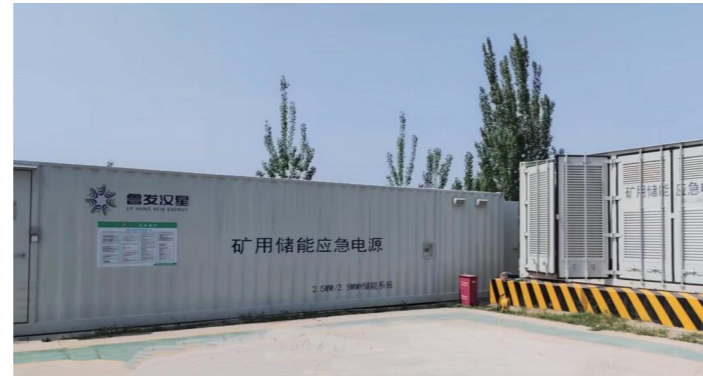
#### Solution Features

- Reduce electricity costs and improve electricity reliability
- Effectively reducing dependence on power companies
- Intelligent charging and discharging management module and high-efficiency inverter unit

# REFERENCE PROJECTS



20MW/40MWh Energy Storage Power Plant



2.5MW/2.5MWh Energy Storage Emergency Power Supply For Anju Coal Mine



5MW/10MWh User-side Energy Storage for Hefei Haier Refrigerator Factory



2MW/3MWh Energy Storage Emergency Power Supply for Hongqi Coal Mine



13MWh Solar Storage and Charging Integrated Project



2MW/4MWh Mining Smart Security Power Supply for Henghe Coal Mine



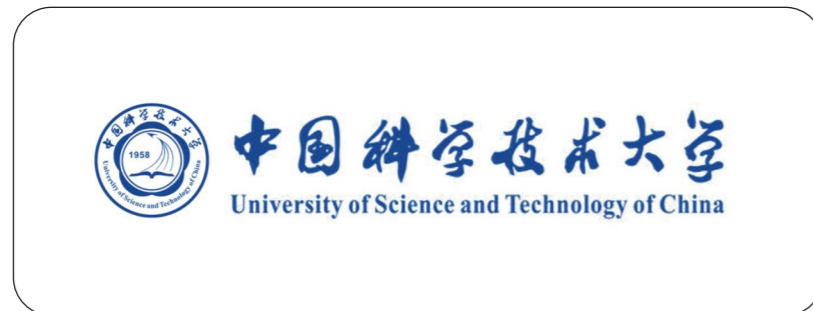
0.5MW/1MWh Use-Side Energy Storage



100kW/215kWh Microgrid Energy Storage Project



## COOPERATIVE TECHNOLOGY COLLEGES AND UNIVERSITIES



## COOPERATIVE STRATEGIC PARTNERS

