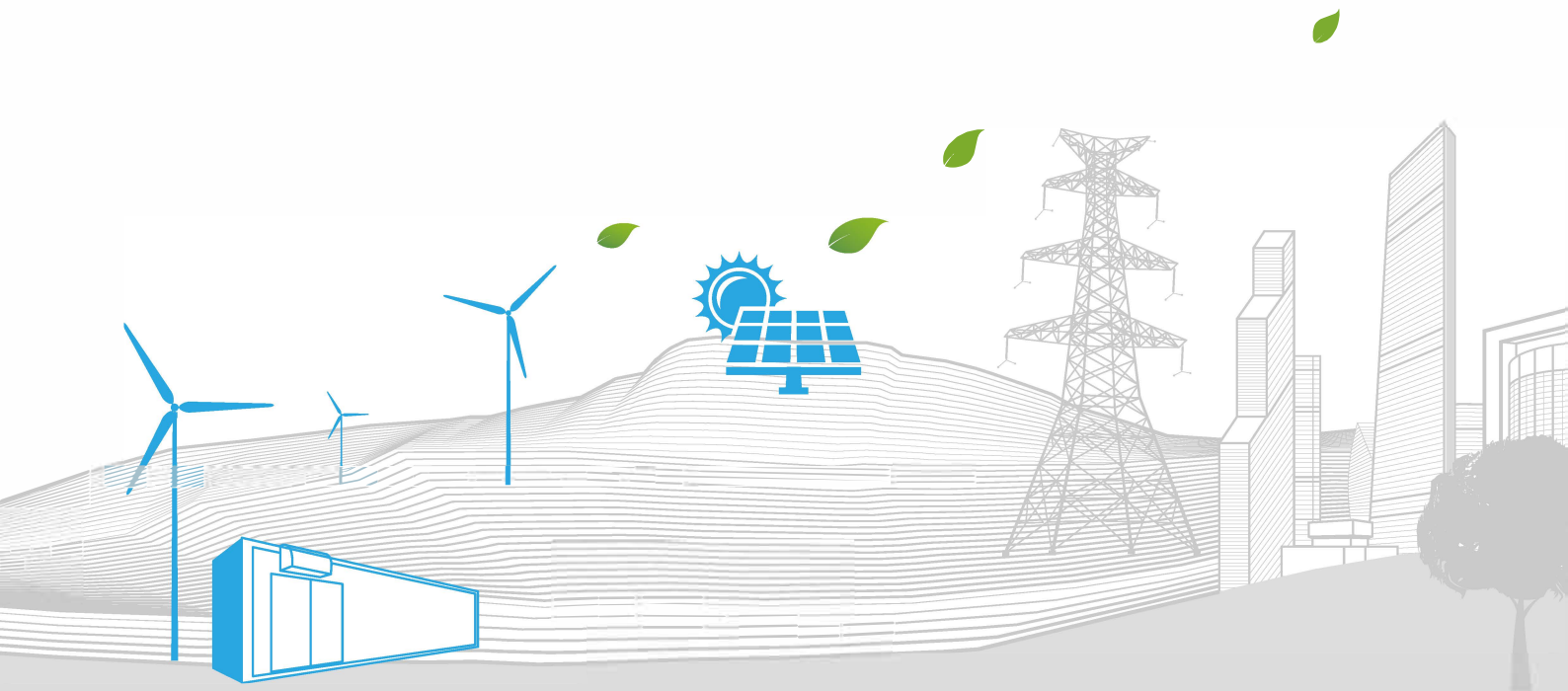




SHANGHAI ELECTRIC

***Contributing to the Realization of
Carbon Peaking and Carbon Neutrality Goals***



Vision

To be a leader in the energy storage and application industry driven by technological innovation.

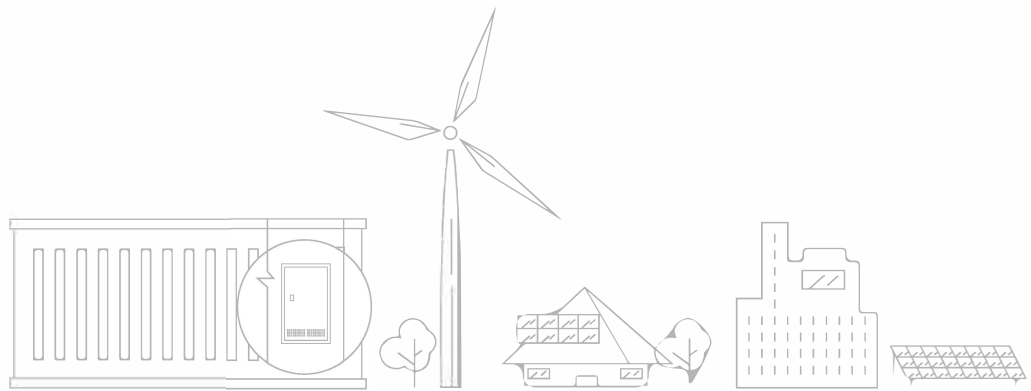
Mission

We are committed to providing reliable, safe, high-performance and innovative energy storage products and solutions to meet the needs of the energy storage industry, thus changing the way people consume electricity and making it possible for electricity consumption without time-space constraints.

ABOUT US

Shanghai Electric Energy Storage has long been committed to the technology research and development, engineering application and market development in electrochemical energy storage services, which can cover the entire industrial chain including cells and energy storage systems. With core competitive advantages such as superior battery technology and optimized system integration technology, the Company can provide one-stop system solutions for new energy+storage, peak load and frequency regulation, grid-side energy storage and industrial and commercial energy storage applications. It is committed to becoming a leading supplier of system products and integrated solutions for the electrochemical energy storage industry.

The Company has two major production bases: Nantong Production Base, equipped with large-scale lithium-ion battery energy storage systems, is the most advanced industrial base integrating R&D, testing and production in East China and has a planned annual output of 10 GWh, and a target output of 5 GWh in the first phase of construction was officially reached in September 2020. Kunshan Production Base, with an annual output of 500 MWh, is now producing battery cells with an energy density that has reached an advanced level in the industry after continuous upgrading.



Nantong Production Base



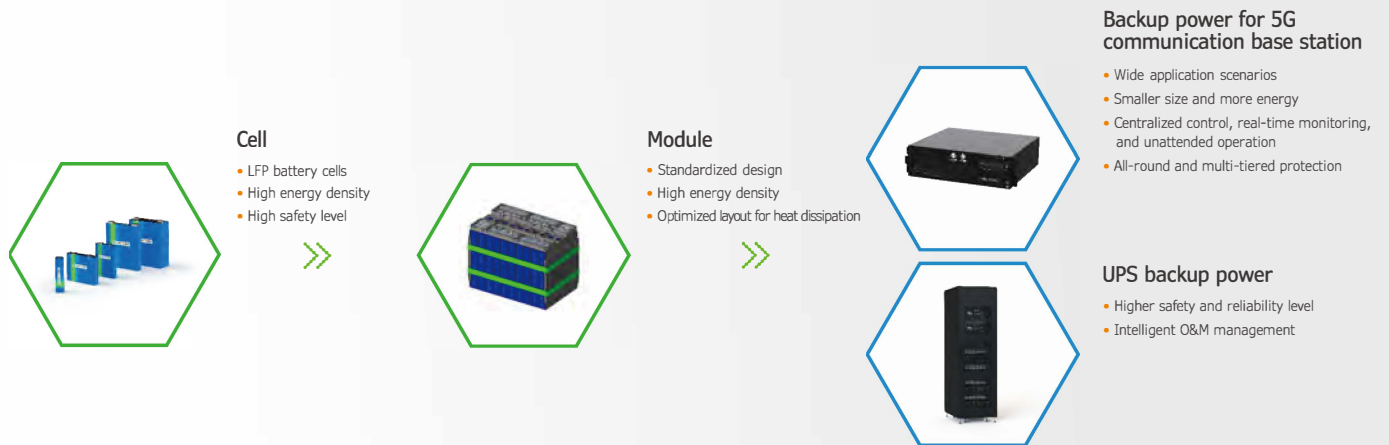
Kunshan Production Base

Covering the entire industrial chain from battery cells to energy storage systems
 To become a leading supplier of electrochemical energy storage technology in China

One-stop Smart Energy Storage System Solutions



Backup Power Solutions



BMS

Multi-level protection for system safety
Refined battery control strategies
Multi-layer balanced management of batteries

SCS

Local monitoring and data analysis management
Multi-level coordination and matching protection in the system



Battery Energy Storage System

Ready to install, maintenance-free, unattended operation
Complete safety protection facilities
Support combined use of multiple types of batteries

Smart O&M Management System for ESS

Intelligent algorithm and real-time optimization
Remote O&M
Big data statistics and analysis



Research & Development

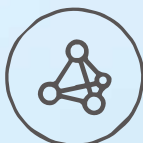


R&D Center

A floor area of **7000m²**

Total annual investment of more than RMB 100 million in R&D

Fully equipped experimental test platform



Fully Functional Laboratory

20+ fully functional laboratories

230+ experimental test and measurement equipment



Authoritative Certification

GB/T31484、GB/T31486、GB/T38031、
GB/T 36276、IEC62619、UL1973、UL9540A、
CB、UL1642、EMC、UN38.3



Expert Team

150+ R&D team members from renowned universities and institutions at home and abroad, with more than **50%** of masters and doctors



Multilateral Cooperation

Cooperating with renowned universities and research institutes at home and abroad



Patent

120+ patents in total

Smart Manufacturing



Digital Production Line

Production and processing
Visual simulation of assembly,
and data-driven production lines



Digital Twin Production System

Equipment interconnection
IoT platform, and big data platform access



System-wide Quality Management

Management of quality objectives and incoming inspection
Full traceability system for the production process



Coordinated Control of Process Quality

Quality inspection standards and process standards
Simultaneous changes for higher real-time capability

After-sale Service



Nationwide Coverage

A number of branches nationwide to provide technical
support in various regions



Quick Response

Quick response and solution after user feedback

Battery Cells

Product Highlights



High Safety Level

Cells are made of highly safe cathode and anode materials and provided with ceramic composite separators, safe function additives and a top cover that protects safety so that the safety of the cells is ensured.



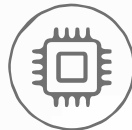
High Efficiency

The electrochemical reaction rate of the ion transmission limitation is improved by the optimized cathode and anode materials and electrolyte and the structural design of electrodes to achieve a higher energy conversion efficiency of cells.



Long Cycle Life

Based on the degradation mechanism of lithium-ion batteries as well as the electrochemical simulation of material systems, a long-life cathode and anode materials-electrolyte system to achieve longer cycle life.



High Quality

Based on a scientific cell design, an international advanced production line is adopted to achieve high-efficiency mass production in a fully automated and intelligent manner, and the consistency of batteries is improved by implementing quality control through the entire process of the production line.

Cylindrical Cells

Cell Parameters	13Ah	15Ah
	LFP cell (long cycle life)	LFP cell (high energy)
Dimension (mm)	Φ33×140	Φ33×140
Weight (g)	260±5	266±5
Operating voltage(V)/Rated capacity(Ah)	3.2 / 13	3.2 / 15
Discharge rate	1C	0.5C
Mass energy density (Wh/kg)	≥157	≥187
Ambient cycle life (cycles)	> 3000(1C/1C)	> 2000

Prismatic Cells

Cell Parameters	27Ah	52Ah
	LFP battery cells	LFP battery cells
Dimension (mm)	20.5×100×144.5	28.5×148×115
Weight (g)	598±5	966±5
Operating voltage(V)/Rated capacity(Ah)	3.2 / 27	3.2 / 52
Discharge rate	6C	4C
Mass energy density (Wh/kg)	≥144	≥175
Ambient cycle life (cycles)	> 2000	> 2000

Prismatic Cells

Cell Parameters	96Ah	100Ah	105Ah	110Ah	300Ah
	LFP battery cells (Medium power and long cycle life)	LFP battery cells (Energy and long cycle life)	LFP battery cells (Energy)	LFP battery cells (High energy)	LFP battery cells (High energy)
Dimension (L×W×H)(mm)	175×27×200	175×27×200	175×27×200	175×27×200	175.4×81.2×200.3
Weight (g)	2020±60	2070±60	2060±50	2070±50	5998±300
Operating voltage(V)/Rated capacity(Ah)	3.2 / 96	3.2 / 100	2.0V-3.65V / 105	2.0V-3.65V / 110	2.5V-3.65V / 300
Discharge rate	1C	0.5C	0.5C	0.5C	0.5P
Mass energy density (Wh/kg)	≥150	≥155	≥165	≥174	≥160
Ambient cycle life (cycles)	≥8000	≥8000	≥3000	≥3000	≥8000(0.5C@25°C100%DOD)

Residential Solution



The product has monitoring software and movement anti-theft function



The product has protections for voltage, current, temperature and short circuit.



Long service life, easy to install



Easy O&M, integrated BMS design, battery support self-management



Item Name	E-Box	E-home	Smart-L	Smart-H
Battery bank capacity	100Ah	100Ah	100Ah	50Ah
Rated energy/voltage	5.12kWh / 51.2V	5.12kWh / 51.2V	5kWh*n / 51.2V	7.5kWh~20kWh/153.6V~409.6V
Operating voltage range	43.2~57.6V	43.2~57.6V	43.2~57.6V	129V~460.8V
Charge/discharge current	50A / 50A	50A / 50A	100A / 100A	40A / 40A
Cycle life (cycles)	25°C >6000	25°C >6000	25°C >6000	25°C >6000
Dimension (W×D×H)(mm)	442×430×130.5	440×160×540	740×240×527(+305*n)	650×230×720(+180*n)
Communication interface	RS485 / CAN	RS485 / CAN	RS485 / CAN	RS485 / CAN
Product certification				IEC62619,CE,UN38.3,UL1973

Note: n=1, 2, 3, 4

ESS Smart Management System



OPS

- Comprehensive remote monitoring of operating parameters and status of systems and components
- AI diagnosis-based management of station O&M work orders and related operations
- Statistics and analysis of station performance, comprehensive performance evaluation and strategy optimization
- The use of fault handling knowledge bases and knowledge graph to improve O&M efficiency
- Control and encryption of communication data transmission to ensure data and system security

BMS

- Efficient active equalization within and between battery packs
- 1,500 voltage rating designed for HV energy storage systems
- Full-time insulation testing for accurate measurement of the system's insulation resistance
- Intelligent condition estimation for accurate characterization of battery status

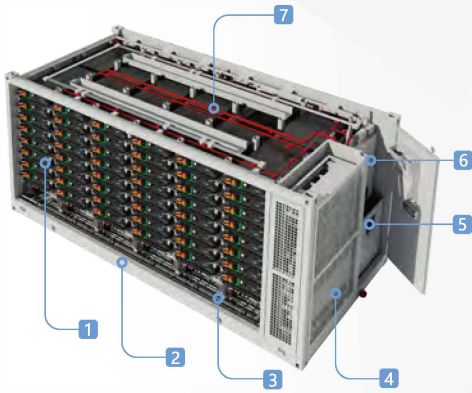
SCU/SCS

- Adaptable to various communication protocols, such as Modbus, IEC104 and IEC61850
- Adaptive thermal management, load following, power distribution, cell-level management strategies
- Fault coordination protection and handling and video linkage of the energy storage system
- Efficient local data storage, data analysis and reporting functions
- Support cloud access, and Full-mode time-sharing transmission of operational data and status

Energy Storage System

EliteCool Liquid Cooling Solution

- 1 Battery pack
- 2 Container frame
- 3 Container pipes
- 4 Chiller / Thermal management system
- 5 Auxiliary power-supply panel
- 6 Electrical control cabinets
- 7 Fire suppression pipes



Multi-protection & Safety and reliability

- Adopting PACK level fire protection + automatic explosion-proof exhaust device + perfluorohexane
- Automatic fire extinguishing system + water spray multiple progressive fire protection system, safe and reliable
- Cluster and container fusion design, resulting in higher container strength



Reduce investment & Increase capacity and efficiency

- Adopting 314Ah+ battery cells, reducing user's investment (more than 10%), reducing floor space (more than 20%), and increasing capacity and efficiency
- Optimize PACK cooling method, lower temperature difference of battery cells ($\leq 2.5^{\circ}\text{C}$), and longer system life (increased by more than 10%)
- Optional liquid cooling module PCS, with less auxiliary power consumption and higher system efficiency



Freedom of choice & Flexibility and efficiency

- Users can choose between a 20 foot AC/DC integrated solution or a 20 foot DC side solution
- The AC/DC integrated solution is embedded with a liquid cooling module PCS, which operates independently with one chopstick and one unit, flexible and efficient, and increases the system's discharge capacity by $\geq 5\%$



Fine control & Intelligent management

- Fine tuned thermal management operation strategy (cooling, heating and self-cycling fine control), multi-stage thermal design and optimization from the cell to the system
- Introduction of intelligent control, optimisation of control strategies, intelligent control of PCS and battery system, enhancement of battery operation efficiency and reduction of on-site operation difficulties

ElitePower Air Cooling Solution



Higher Safety Level

- Three-level protection control strategy
- Perfect BMS real-time detection
- Multi-level early warning and firefighting linkage
- Optional explosion-proof components to further improve safety



Smarter management

- Coordinated control of PCS and battery system
- Autoswitch clusters
- Multi-stage thermal design and optimization from cell to system
- Refined thermal management operation strategy



Higher output

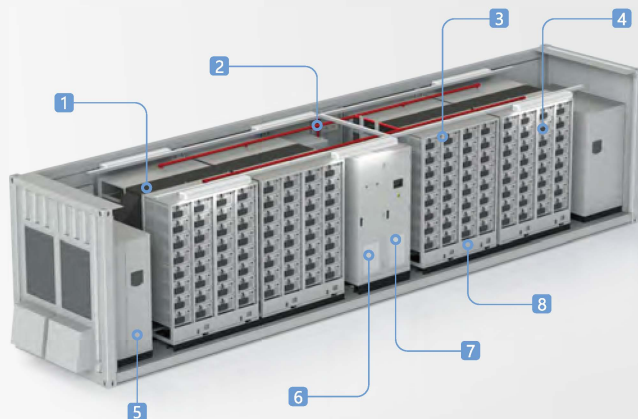
- Advanced material system, high-efficiency cell
- Optimized grouping with high consistency
- Optional active equalization to further improve power and life



Greater integration

- Standardized and modular design with a small floor area
- OPS system to improve O&M efficiency

- 1 Air duct
- 2 Fire pipe
- 3 Battery cluster rack
- 4 Battery subrack
- 5 Air conditioner
- 6 AC cabinet
- 7 DC cabinet
- 8 HV compartment



EliteCool Liquid Cooling Solution



Product type	SEC-ESS-5MWh	SEC-ESS-3.44MWh	SEC-ESS-3.42MWh
Voltage range at DC side	1164.8V~1497.6V	1075.2V~1382.4V	1108.8V~1425.6V
Outline dimensions (L×W×H)	6058×2438×2896mm	6058×2438×2896mm	6058×2438×2896mm
Weight	45T	35T	33T
Cell specification	314Ah	280Ah	300Ah
Product platform	0.5P/1500V	0.5P/1500V	0.5P/1500V
IP grade	IP54 (higher grade available)	IP54 (higher grade available)	IP54 (higher grade available)
Ambient operating temperature	-30~55°C	-30~55°C	-30~55°C
Product certification	UL9540A,UL1973,IEC62619,IEC61000,IEC62933,UN38.3,UN3536	UL9540A,IEC62619,IEC61000,UN38.3,UN3536	UL9540A,IEC62619,IEC61000,UN38.3,UN3536

ElitePower Air Cooling Solution



2P16S Series

Product Model	SEC-ESS-1.25MW/3.24MWh	SEC-ESS-2.5MW/2.76MWh
Voltage range at DC side	672~864V	672~864V
Dimension (W×D×H)(mm)	12192×2438×2896mm	12192×2438×2896mm
Weight	45T	43T
Cell specification	96Ah	90Ah
Product platform	Below 0.5P / 1000V	Below 1P / 1000V
DOD	90%	90%
Energy efficiency at DC side	94%	90%
IP grade	IP54	IP54
Ambient operating temperature	-20~50°C	-20~50°C
Product certification	GB/T36276,UN38.3	GB/T36276,UN38.3

2P20S Series

Product Model	SEC-ESS-1.25MW/3.76MWh	SEC-ESS-2.5MW/3.34MWh
Voltage range at DC side	952~1224V	952~1224V
Dimension (W×D×H)(mm)	12192×2438×2896mm	12192×2438×2896mm
Weight	52T	49T
Cell specification	96Ah	96Ah
Product platform	Below 0.5P / 1500V	Below 1P / 1500V
DOD	90%	90%
Energy efficiency at DC side	94%	90%
IP grade	IP54	IP54
Ambient operating temperature	-20~50°C	-20~50°C
Product certification	GB/T36276,UN38.3,IEC62619,UL1973	GB/T36276,UN38.3,IEC62619,UL1973

SMART-ONE C&I all-in-one Solution

SMART-ONE and UNIQUE-ONE C&I ESS products are made by Shanghai Electric Gotion for industrial and commercial application scenarios, aimed to provide a solution with high-safety, high-reliability, and easy scalability. These products adopt a highly integrated system design and can flexibly match various C&I scenarios. They can help relieve grid pressure through the practice of peak-shaving / energy shifting under different electricity consumption patterns. It is also suitable for applications in microgrid scenarios.

The products are divided into two types: SMART-ONE and UNIQUE-ONE. The SMART-ONE product is easy to operate and maintain and can be flexibly configured in capacity; the UNIQUE-ONE product is more compact and has a high energy density.



Excellent Battery Performance, With Long Service Life

- Good battery consistency, small internal resistance and excellent
- Wide battery operating temperature range and available in various severe application environments



Standardized and Modular Design

- Compact design and high space utilization
- Remote installation
- Extensible design to meet customization needs for customers
- Modular design for the whole series of products, easy to install and maintain



Seamless AC/DC Switching, Redundant Power Supply

- Supporting double-circuit redundant power supply, with AC power preferred
- Seamless switching from AC to DC in case of AC power loss



Comprehensive Protection and Real-time Monitoring

- Supports Modbus-TCP for network port communication
- Creating a three-level protection and control strategy for the protection characteristics of lithium battery BMS
- A perfect BMS real-time detection to protect the safe operation of the battery system



Safety, Environmental Protection and Strong Adaptability

- Perfluorohexanone fully immersed firefighting configuration, with high safety and environmental friendliness
- Grid-connected operation, off-grid operation and grid-connected/off-grid switching functions



Unattended and Remote O&M

- Availability >99%
- Supporting remote software upgrades



SMART-ONE C&I all-in-one Solution

Product Type	UNIQUE-ONE				SMART-ONE	
Product Model	U200		S150		S200	
Cell Grouping Method	1P48S×5	2P20S×13	2P20S×12	2P20S×11	3P16S×15	3P16S×14
Discharge Rate	0.5P				0.5P	
PCS Power	100kW	75kW	73kW	67kW	100kW	
Rated Energy	215kWh	160kWh	147kWh	135kWh	220kWh	205kWh
Available Energy	200kWh	150kWh	138kWh	126kWh	200kWh	186kWh
DC Voltage Range	672-864Vdc	728-936Vdc	672-864Vdc	616-792Vdc	672-864Vdc	627.2-806.4Vdc
AC Voltage				400Vac		
Maximum system RTE				91%		
Protective Class				IP54		
Anti-corrosion Class				C3-M (higher grade available)		
Communication Port				RJ45, Modbus-TCP protocol		
Working Temperature				-20~45°C		
Cooling Mechanism	Liquid cooling		Forced air cooling			
Fire Extinguishing Agent				Perfluoroacetone / Aerosol		
Humidity Range				5%~95%		
Operating Altitude				≤3000m		
Cycle Life				≥8000 cycles		
Dimensions (W×D×H)	1.0×1.25×2.4m		1.0×1.1×2.4m		1.5×1.25×2.4m	
Weight (T)	2.6	2.0	1.9	1.8	2.4	2.2
Certifications	IEC62619、IEC61000、UN38.3					

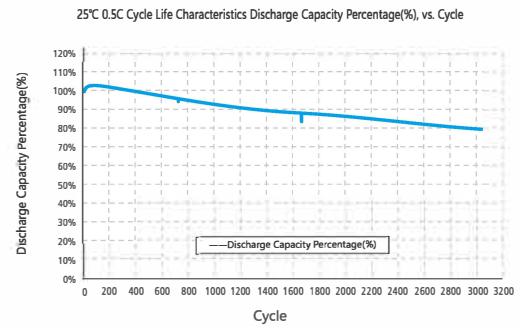
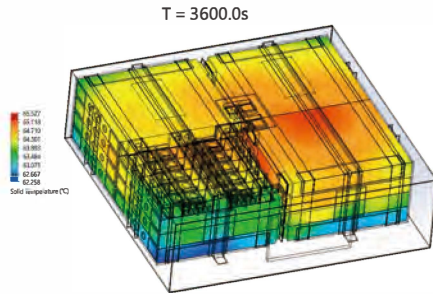


Backup Power System



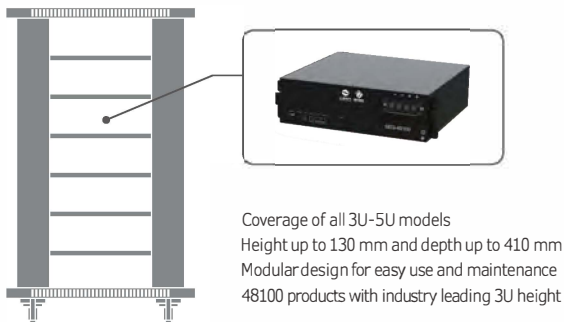
High Safety Level

- LFP material with higher safety factor and good thermal stability
- Electrical safety redundancy design to ensure overcurrent protection
- Full thermal management validation to control cell temperature rise and temperature consistency
- Special battery management system for ESS to monitor the batteries in real time



High Energy Density

- High energy ratio and high storage energy density
- Small size, light weight, space saving
- High tolerance to operating temperatures and long cycle life



- One-third the size of a lead-acid battery
- Comprehensive over-voltage, over-current and over-temperature protection functions
- Remote smart O&M management



Rack Mounted Backup Power System



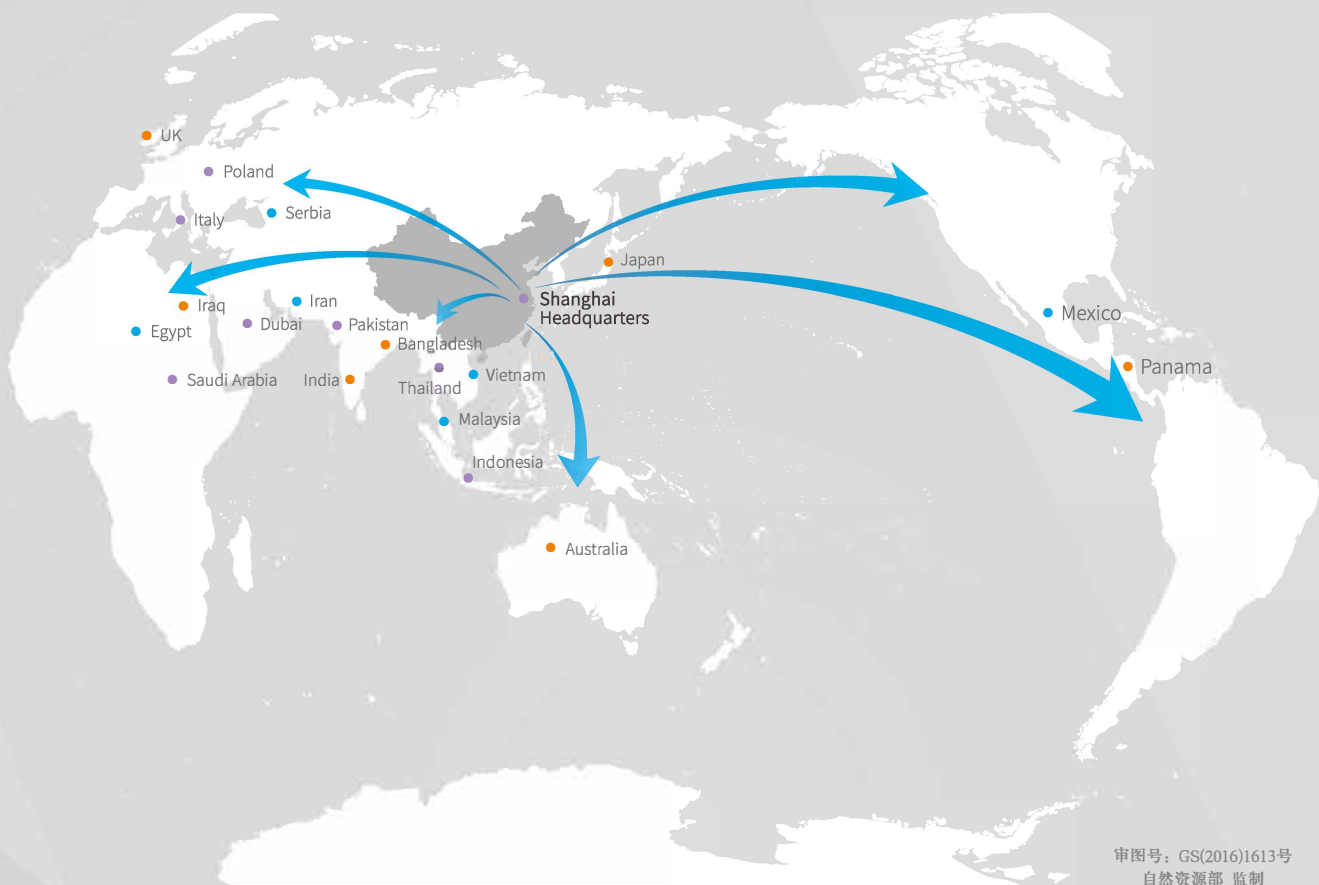
Model	SEG48100	SEG48100I	SEG48150	SEG48200
Dimension (W×D×H)(mm)	442×420×132	442×400×130.5	442×540×132	442×550×185
Weight (kg)	40.5	42±2	58	75
Cell specification (Ah)	105	105	52	105
Rated voltage / Rated capacity	48V / 100Ah	48V / 100Ah	48V / 150Ah	48V / 200Ah
Maximum charge-discharge rate	1C	1C	1C	1C
Protection level	IP20	IP20	IP20	IP20

UPS Backup Power System



Model	30min Backup product		15min Backup product		10min Backup product	
Voltage	400V-584V / ±200V-±292V		400V-584V / ±200V-±292V		400V-584V / ±200V-±292V	
Rated capacity of battery cabinet	52Ah	96Ah / 105Ah	52Ah	96Ah	88Ah	27Ah
Battery module	1P16S×10	1P16S×10	1P16S×10	1P16S×10	1P16S×10	3P20S×16
Nominal electric quantity	26.624kWh	49.152kWh / 53.76kWh	26.624kWh	49.152kWh	45.056kWh	82.944kWh
Dimension (W×D×H)(mm)	0.6×0.8×2	0.6×0.8×2	0.6×0.8×2	0.6×0.8×2	0.6×0.8×2	0.6×0.88×2.05
Maximum configured power	50kW	100kW	100kW	200kW	240kW	450kW
Operating temperature	15~35°C	15~35°C	15~35°C	15~35°C	15~35°C	15~35°C
Product certification	UL1973, UL1642, IEC62619, UN38.3, UL9540A and CB					

SALES NETWORK



审图号: GS(2016)1613号
自然资源部 监制

PROJECT OVERVIEW

Shanghai	3MW/12MWh Smart Energy Storage Project in Minhang Industrial Park, Shanghai 1.5MW/5.4MWh Customer-Side Energy Storage Project in Pudong Industrial Park, Shanghai 250kW/1MWh Energy storage System Project in Shanghai Jinlian Industrial Park 250kW/1.128MWh Warehouse Microgrid System Upgrading Project in Shanghai
Jiangsu	2MW/8MWh Customer-Side Energy Storage Project in Kunshan Industrial Park 1MW/4MWh Customer-Side Energy Storage Project in Suzhou, Jiangsu 10MW/40MWh Customer-Side Energy Storage Project of Lianyungang Huale Alloy Co., Ltd. 10MW/40MWh Customer-Side Energy Storage Project of Lianyungang Binxin Steel Co., Ltd.
Anhui	100MW/200MWh Grid-Side ESS Demonstration Project in Jinzhai County, Anhui Province 10MW/10MWh Wind ESS Project in Shencun, Xuanzhou District, Anhui Province 10MW/10MWh Wind Storage Project in Boyong, Qiaocheng District, Anhui Province
Henan	1MW/1.2MWh Customer-Side Energy Storage Project in Zhengzhou, Henan 2.8MW/2.8MWh Wind Storage Pilot Project in Yanjin, Henan
Hebei	100kW/401kWh Energy Storage Pilot Project in Xiong'an New Area
Guangdong	1MW/1MWh Wind Power and Energy Storage Pilot Project in Shantou, Guangdong 18MW/9MWh Thermal power Frequency Regulation and Energy Storage Project of Guangdong Yuedian Dapu Power Generation Co., Ltd. 26MW/13MWh Thermal Power Frequency Regulation and Energy Storage Project of Yangxi Power Station in Guangdong
Shaanxi	Mobile Energy Storage Project in Xi'an, Shaanxi
Gansu	Grid-side 50MW/200MWh Energy Storage Project in Guazhou County, Gansu 20MW/40MWh Wind Storage Project in Jinchang, Gansu 40MW/90MWh Shared Energy Storage Power Station Project in Dingxi, Gansu
Qinghai	32MW/64MWh Grid-side Shared Energy Storage Pilot Project in Qinghai
Xinjiang	60MW/180MWh Energy Storage Project in Xinjiang 1MW/1.2MWh Mobile Power Supply Project for Oilfield Operations in Xinjiang
Jilin	10MW/20MWh Power Side Energy Storage Project in Liaoyuan, Jilin
Tibet	2.5MW/20MWh Solar Power and Energy Storage Pilot Project in Tibet
Inner Mongolia	State Grid 1.1MW/2.2MWh Grid-side Energy Storage Project in the Eastern Area of Inner Mongolia 1MW/1.15MWh Wind Power Energy Storage Project in Ulanqab, Inner Mongolia

Typical Grid-side ESS Project

100MW/200MWh

Anhui Independent Energy Storage Power Station Project

- Anhui's first single 100 MW independent energy storage power station
- Anhui's first shared energy storage pilot project



32MW/64MWh

Qinghai Photovoltaic Shared Energy Storage Power Station Project

- The first third-party invested shared energy storage project in China
- The largest station building energy storage power station in China

100MW/100MWh

UK REP1&2 Energy Storage Project

- The first large-scale overseas energy storage project
- Meet the demand for dynamic service containment



40MW/90MWh

Gansu Energy Storage Power Station Project

- Compressed Air+Lithium Battery Combination Scheme Shared Energy Storage Demonstration Project



Typical Power-Side ESS Project

60MW/180MWh

Xinjiang energy storage Project

- High altitude, high wind sand



10MW/10MWh

Anhui wind power distribution and storage Project

- The first batch of wind energy storage projects in Anhui province

10MW/20MWh

Jilin energy storage Project

- 30°C energy storage project



2.5MW/20MWh

Tibet Light Storage Comprehensive Energy Project

- The highest altitude and largest scale light storage project in China
- Weak grid support demonstration project for long time backup



Typical Industrial and Commercial side ESS Project

3MW/12MWh

Minhang Smart Energy Demonstration Project

- The largest C&I energy storage project in Shanghai



1MW/1MWh

Guangdong Microgrid Project

- Microgrid projects in high salt spray environments
- Provide black start services for large wind turbines

Kunshan Smart Low Carbon New Energy Microgrid Project



Nantong C&I energy storage project



Typical Backup Power Project for 5G Communication Base Station



ZTE 5G Communication Base Station Project

Shanghai Electric Gotion has signed a cooperation agreement with ZTE to provide them with backup power products developed by our company, and has been recognized for two years (2023 Best Service Support Award, 2022 Best Delivery Support Award)

Fiberhome Communication Base Station Project in Indonesia

The Company provides its independently developed 3U backup power products in batches to Fiberhome, the second largest operator in Indonesia, for the construction of 5G communication base stations.

The cooperation between the Company and Fiberhome has achieved a win-win situation for both parties, with good benefits from orders and a bright future.



Typical UPS Backup Power Project

Nantong Production Base 60kVA/172kWh UPS Project

Project Configuration

UPS: VERTIV 60kVA

Battery: Shanghai Electric Gotion 409.6V105Ah,
with 4 packs in parallel and a total capacity of 172 kWh

Backup time: 2h



Lithium ion Battery System HVDC Project of Baidu

Project Configuration

HVDC: Zhongheng Electric 300kVA

Battery: Shanghai Electric Gotion 409.6V52Ah,
with 4 packs in parallel and a total
capacity of 84 kWh

Backup time: 15min

UPS Project of Kehua Financial Center

Project Configuration

UPS: Kehua 75kVA

Battery: Shanghai Electric Gotion 409.6V105Ah, with a total capacity of 43 kWh

Backup time: 30min

UPS Project of Kehua and Shanghai Customs College

Project Configuration

Backup time: 15min

Battery: Shanghai Electric Gotion 409.6V52Ah, with a total capacity of 21kWh

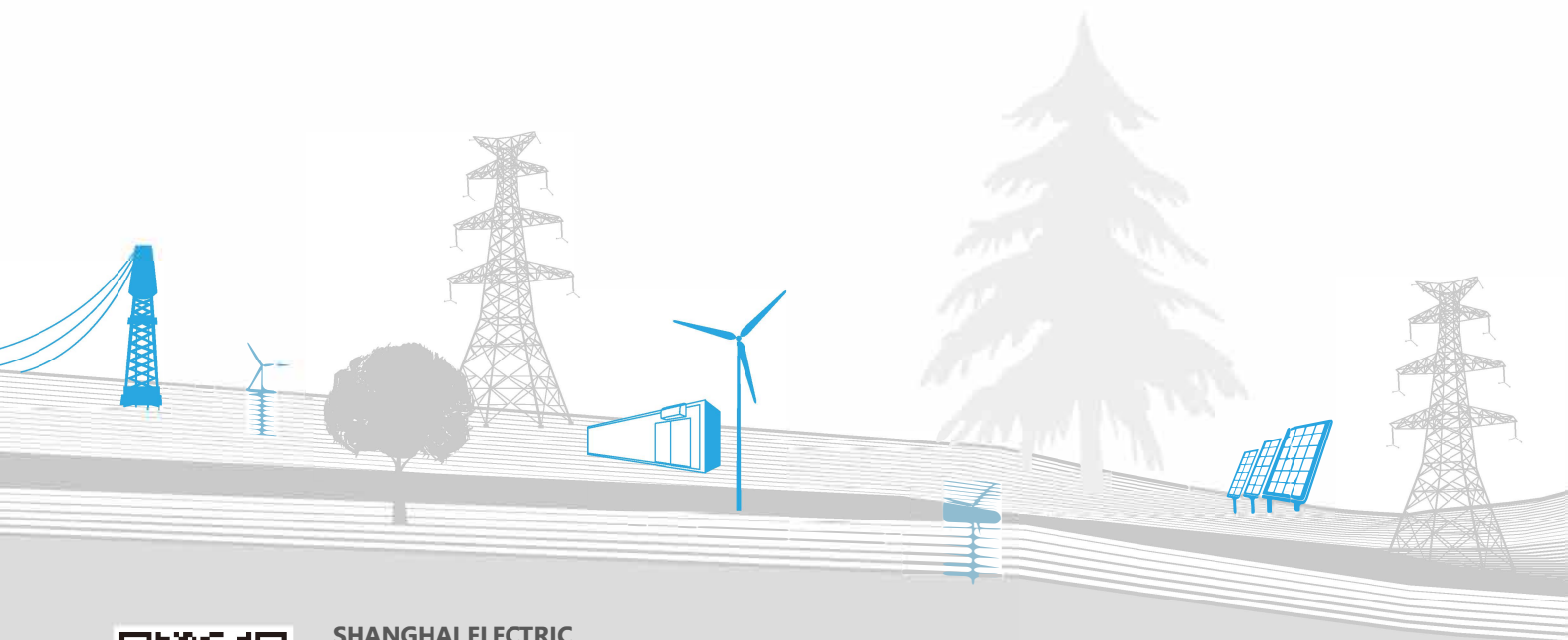
UPS: Kehua 60kVA



HONORS & CERTIFICATIONS

Quality Certificates





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www.shanghai-electric.com/listed/gxxnygsjs/