

VESTWOODS



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C&I ENERGY STORAGE SOLUTION

COMPANY OVERVIEW

Provide competitive lithium battery products and technical solutions for global customers



Hangzhou Vestwoods Technology Co., Ltd. a high-tech enterprise by Haier Energy, is its exclusive subsidiary specializing in lithium battery system integration for new energy solutions. We deliver one-stop green energy solutions and services to global customers.

Founded in 2016, Vestwoods launched its overseas business at a fast pace, built out manufacturing bases, and secured a leading position in India's telecom backup power market. We have since expanded our footprint to over 50 countries across Europe, Asia and Africa, and now operate a GWh-scale manufacturing base.

60%
R&D as a Percentage

200+
Patents

5GWh
Annual Capacity

80+
Global Customers

50+
Countries and Areas

25,000m²
Production area

PRODUCTION AND R&D CENTERS

Qingdao R&D Center

Technology Industry Park R&D Center:
Focusing on the new energy industry ecosystem, it integrates research and development, manufacturing, production and supply, market sales, and achievement display into one, creating an eco-friendly park for collaborative innovation across the entire industry chain.



Qingdao Manufacturing Center

Positioned as an intelligent energy controller IoT factory, the park covers a total area of 302 acres with a total investment of 6 billion yuan. It is an integrated park combining research, production, supply, sales, and exhibition, aiming to create the industry's first lighthouse factory for inverters.



Nantong Manufacturing Center

Covering an area of 40 acres, the modern production area spans 25,000 square meters, with an annual peak capacity exceeding 5 GWh. It is equipped with Industry 4.0 fully automated production lines, featuring an MES intelligent production management system, enabling full-process digital control from raw materials to finished products, empowering efficient and precise manufacturing.



Hangzhou R&D Center

It is certified as a provincial-level R&D center for high-tech enterprises by Zhejiang Provincial Science and Technology Department in 2023, focuses on communication backup power, residential & commercial energy storage, data center UPS, BMS and EMS. It realizes full-stack independent R&D of energy storage systems with over 200 core patents, nearly 100 global certifications and more than 20 awards.

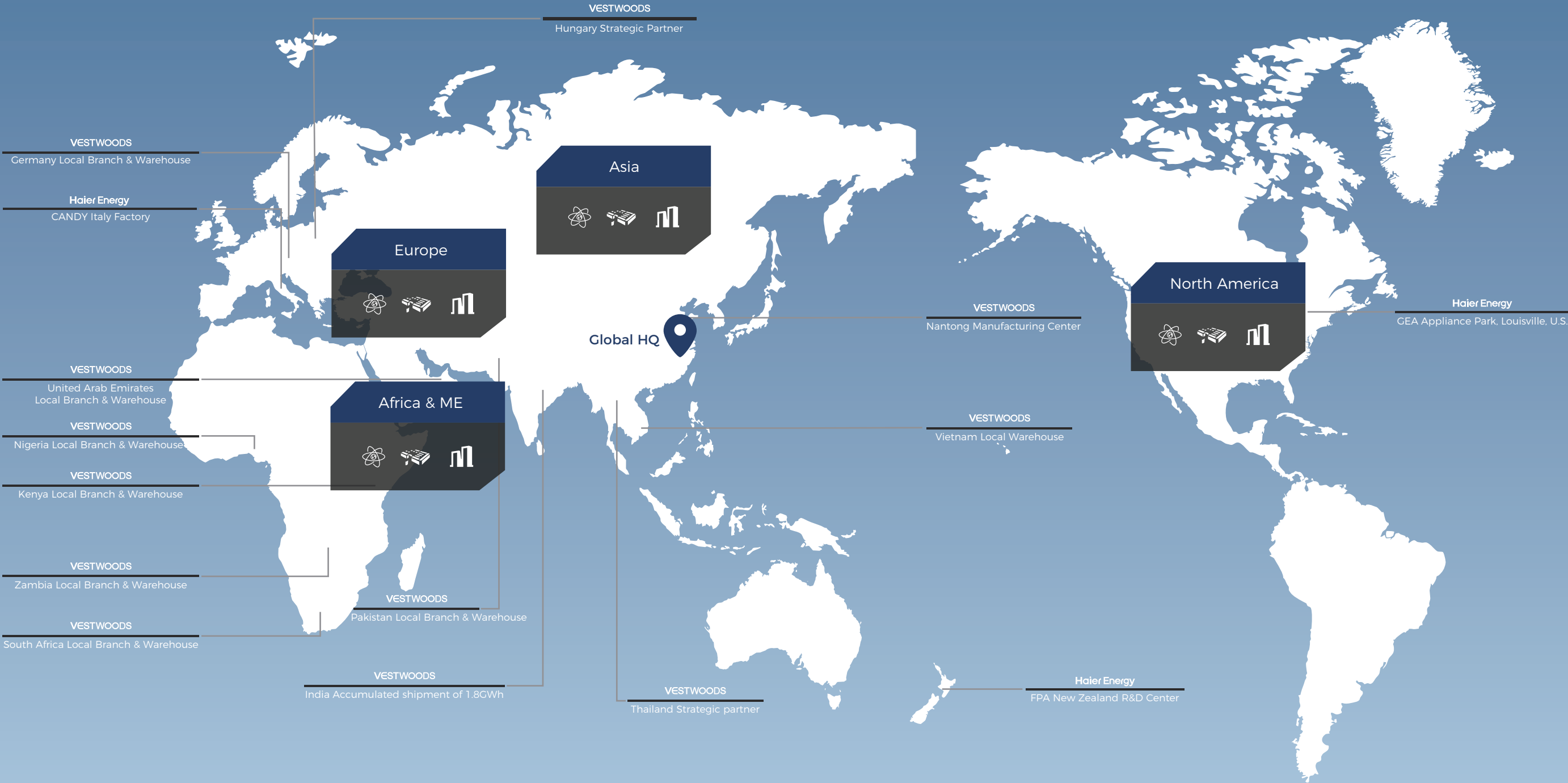


GLOBALIZATION

Building a globalized multi-level and multi-mode industrial ecosystem

Adhering to the concept of “user-centered” to provide customized, scenario-based, intelligent new energy solutions for global users.

-  Service Network
-  Local Warehouse
-  Branches



C&I ESS SOLUTION

A modular, full-scenario smart energy system that integrates PV, battery storage, and intelligent EMS to deliver end-to-end customized solutions for mining sites, universities, hotels, factories, and other C&I scenarios—promoting sustainable growth and long-term energy strategic upgrades.



APPLICATION SCENARIOS



Energy independence for Off-grid Mines

Green Mines Smart Microgrid Solution

-  Grid-forming technology for Continuous Power Supply
-  Fuel Substitution for Significant Cost Reduction
-  Stable Frequency & Voltage for Equipment Protection



No Outages No Losses

Green Factory Smart Energy Solution

-  Stable Power Quality for Extended Equipment Life
-  Energy Optimization with Precise Cost Control
-  Zero Downtime Zero Losses



Smart Energy Smart Minds

Green Campus Smart Energy Solution

-  Secure Backup for Reliable Campus Protection
-  PV Savings Long-term Value Creation
-  Green Demonstration for Educational Impact



Store More, Profit More

Green Mall Smart Energy Solution

-  Peak Shaving for Reduced Demand Charges
-  Reliable Backup for Business Continuity
-  Energy Cost Visibility for Smart Asset Management



Zero Downtime Zero Complaints

Green Hotel Smart Energy Solution

-  Uninterrupted Service for Superior Guest Experience
-  Fast Payback with Stable Long-Term Returns
-  Millisecond-Level Switching for Full Protection



Clean Energy for Sustainable Agriculture

Green Farm Smart Energy Solution

-  Off-Grid & Weak-Grid Adaptability for Remote Areas
-  Diesel Substitute for Lower Operating Costs
-  Stable Power Supply for Continuous Agricultural Production

SOLUTION BENEFITS



01

Self-Developed BMS & EMS with VPP Integration

Powered by fully-stack self-developed BMS and EMS, enabling deep system integration and coordinated operation. Supports VPP connectivity and intelligent dispatch to match grid demand and optimize energy resource allocation.

03

Multi-Layer Protection for Safety & Durability

Engineered with comprehensive electrical protection, advanced monitoring sensors, and long-life LFP batteries, ensuring high reliability, strong environmental adaptability, and long service life.

02

Flexible & Proven Solutions for Diverse Energy Scenarios

A mature and flexible solution designed to maximize self-consumption, emergency backup, peak shaving, and time-of-use energy arbitrage, adapting to multiple commercial and industrial scenarios.

04

Localized Operation with One-Stop Service

Supported by localized operation teams, delivering fast response, rapid deployment, and full lifecycle services from project planning and installation to long-term O&M.



Indoor C&I ESS Solution

Rack-Mounted Battery(HV)



Features and Advantages

Safer

- High-quality LFP batteries.
- Over-discharge, overcharge, overcurrent, and extreme temperature protection.
- Supports AC coupling, DC coupling, and microgrid scenarios.

Reliable

- Operating temp: -20~55°C.
- Operate up to 3000m altitude.
- Support up to 10 Cluster in parallel.
- Support up to 160A current output.

Easy Installation

- Time-saving design
- Quick-Connect
- Support 4-13 packs.

Intelligent

- LED display screen.
- Intelligent charge/discharge strategy.
- Support remote operation and maintenance.

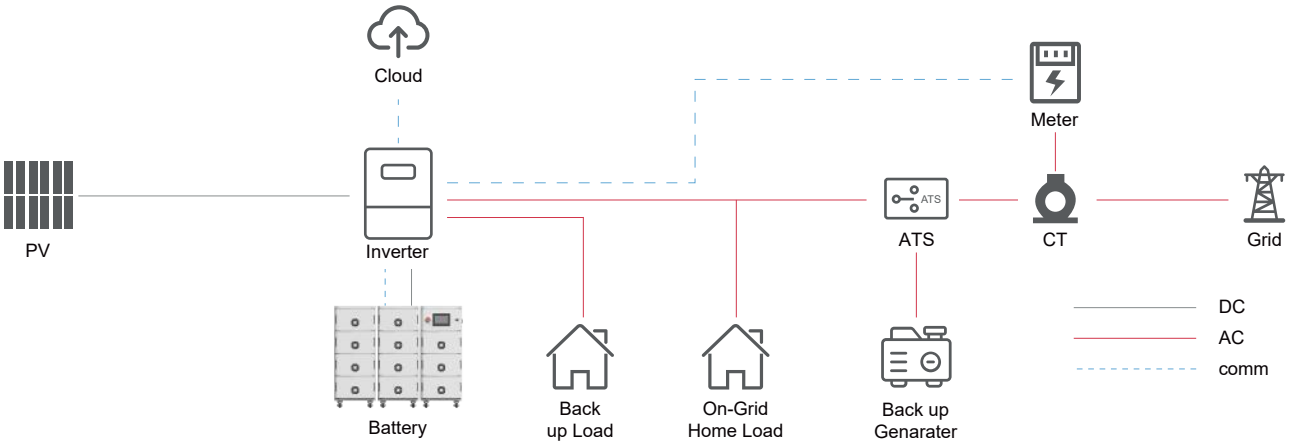
VEB 100kWh-261kWh(AF/EU)

Technical Parameters



Model	VEB series								
System									
Module Quantity	5	6	7	8	9	10	11	12	13
Nominal Capacity	100kWh	120kWh	140kWh	160kWh	180kWh	200kWh	221kWh	241kWh	261kWh
Nominal Voltage	320V	384V	448V	512V	576V	640V	704V	768V	832V
Operation Voltage Range	280-360V	336-432V	392-504V	448-576V	504-648V	560-720V	616-792V	672-864V	728-936V
Weight	813kg	963kg	1112kg	1261kg	1423kg	1572kg	1719kg	1868kg	2030kg
Battery Type	LFP								
Cell Capacity	314Ah								
Rated Charge/Discharge Current	160A(0.5C)								
Battery Module									
Module Capacity	20.09kWh								
Rated Voltage	64V								
Dimension(W*D*H)	483*941*261mm								
Weight	149kg								
General									
Cycle Life	6000 Cycles@80%DOD, 25℃								
Communication	CAN/RS485								
Altitude	<3000m								
Expansion	Max. 6 Cluster System in Parallel								
Charge/Discharge Temperature Range	Charge:0℃-55℃/Discharge:-20℃-55℃								
IP Rating	IP20								
Operating Humidity	5-95%RH(no condensation)								
Environment	Indoor								
Installation Type	Stackable Level Package((Rack Option)								
Cooling Concept	Natural Cooling								
Standard	UN38.3/CE-EMC/IEC62619/IEC 62477/IEC 63056								
Inverter Match	Deye/Solis/Megarevo etc.								
Transport testing requirement	UN38.3								

System Diagram



Small Outdoor C&I ESS Solution

VEB Series



Features and Advantages

Safe and Reliable

- High-quality LFP batteries.
- Equipped with a comprehensive fire protection system including smoke, heat, and water detection + suppression (aerosol).

High Economy and Efficiency

- Supports DC coupling and AC coupling solutions.
- Supports peak-valley arbitrage.
- Support smart scene function.
- Seamless On/Off-Grid Connectivity.

High integration

- Factory pre-installed, full container shipping.
- Modular Design, Easy installation and maintenance.
- Simple wiring.

High intelligence

- One-Click Savings.
- Support 7x24h remote O&M.
- Smart Energy Scheduling & Dispatch.
- Energy Trading.

VEB 80kWh-120kWh

Technical Parameters



Model	Solis 30kW Inverter	Solis 40kW Inverter	Solis 50kW Inverter
AC Parameters			
Max. DC Input Power	60kW	80kW	100kW
MPPT Range	150-850V		
Rated DC Input Voltage	600V		
No. of MPP Trackers	3	4	4
Rated output power	30kW	40kW	50kW
Maximum output apparent power	30kVA	40kVA	50kVA
Output Frequency and Voltage	50/60Hz; 3/N/PE, 220V/380V, 3/N/PE, 230V/400V		
Max. Efficiency	97.60%		
Dimensions (W*D*H)	530*290*880mm		

Model	VEB256-80kWh	VEB320-100kWh	VEB384-120kWh
System			
Module Quantity	4	5	6
Nominal Capacity	80kWh	100kWh	120kWh
Nominal Voltage	256V	320V	384V
Operation Voltage Range	224V~288V	280V~360V	336V~432V
Rated Charge/Discharge Current	157A		
Max. Charge/Discharge Current	160A/180A		
Anti-corrosion Grade	C3/C5(Optional)		
Cycle Life	6000 Cycles@80%DOD, 25°C		
Installation Environment	Outdoor		
Communication	CAN/LAN/RS485/4G		
Cooling Concept	Air Conditioning		
Altitude	<3000m		
DC side expansion	Max. 10 Cabinets in parallel		
Charge/Discharge Temperature Range	Charge: 0-60°C, Discharge: -20-60°C		
Ingress Protection	IP55		
Dimension (W*D*H)	800*1350*2200mm		
Weight	Approx. 1056kg	Approx. 1203kg	Approx. 1350kg
Operating Humidity	≤95%RH(no condensation)		
Transport Test Requirement	UN38.3		
Battery Module			
Battery Type	LFP		
Cell Capacity	314Ah		
Module Capacity	20kWh		
Rated Voltage	64V		
Operation Voltage Range	56~72V		
Communication	CAN		
Max. Charge/Discharge Current	180A		
Dimension (W*D*H)	483*941*261mm		
Weight	147kg		

Outdoor C&I ESS Solution

VEB Series



Features and Advantages

Safe and Reliable

- High-quality LFP batteries.
- Equipped with a comprehensive fire protection system including smoke, heat, and water detection + suppression (aerosol).

High Economy and Efficiency

- Supports DC coupling and AC coupling solutions.
- Supports peak-valley arbitrage.
- Support smart scene function.
- Seamless On/Off-Grid Connectivity.

High integration

- Factory pre-installed, full container shipping.
- Modular Design, Easy installation and maintenance.
- Simple wiring.

High intelligence

- One-Click Savings.
- Support 7x24h remote O&M.
- Smart Energy Scheduling & Dispatch.
- Energy Trading.

VEB Series 140kWh-261kWh

Technical Parameters



Model	Solis 50kW Inverter	Solis 80kW Inverter	Solis 125kW Inverter
AC Parameters			
Max. DC Input Power	100kW	160kW	240kW
MPPT Range	150-850V	150-950V	150-950V
Rated DC Input Voltage	600V		
No. of MPP Trackers	4	10	10
Rated Output Power	50kW	80kW	125kW
Max. Output Apparent Power	50kVA	80kVA	125kVA
Output Frequency and Voltage	50/60Hz; 3/N/PE, 220V/380V, 3/N/PE, 230V/400V		
Max. Efficiency	97.8%	97.60%	97.60%
Dimensions (W*D*H)	530*290*880mm	1174*400*814mm	1174*400*814mm

Model	VEB448-140kWh	VEB512-160kWh	VEB576-180kWh	VEB640-200kWh	VEB704-221kWh	VEB768-241kWh	VEB832-261kWh
System Parameters							
Battery Type	LFP						
Module Quantity	7	8	9	10	11	12	13
Nominal Battery Voltage	448V	512V	576V	640V	704V	768V	832V
Nominal Battery Energy	140kWh	160kWh	180kWh	200kWh	221kWh	241kWh	261kWh
Operating Voltage Range	392-504V	448-576V	504-720V	560-720V	616-792V	672-864V	728-936V
Rated Charging Current	160A						
Rated Discharging Current	180A						
Charging Temp. Range	0°C-55°C						
Discharging Temp. Range	-20°C-55°C						
Anti-corrosion Level	C4(C5 option)						
IP Rating	IP55						
Expansion	Max. 10 Cabinets in parallel						
Communication	RS485, CAN, Ethernet						
Compatible Inverters	Solis, Deye, SAJ, Megareva etc.						
Design Certification	UN38.3/CE-EMC/IEC62619/IEC 62477/IEC 63056						
Firefighting	Aerosol, Perfluoro(optional)						
Dimension(W*D*H)	1200*1523*2300mm						
Weight(Approx.)	1790kg	1940kg	2090kg	2240kg	2390kg	2540kg	2690kg



C&I ESS Solution

VED Series — Air-cooled

Features and Advantages



Safer

- Flood, smoke and temperature detection systems, active exhaust and fire alarm batteries systems, aerosol fire extinguishing.
- LFP Battery, more than 6000 charging cycles.longer service life.



High performance

- Wide temperature range: -20~55°C suitable for severe cold and hot weather.
- IP55 protection level, outdoor use.
- No additional DC combiner cabinet or photovoltaic combiner cabinet is required; the PCS cabinet has reserved interfaces.



High stability

- Using pure off-grid and parallel-off-grid (parallel-off-grid handover time less than 20ms), in parallel grid scenarios.



High intelligence

- Supports virtual power plants Configure local control and remote monitoring platform.
- Real-time collection and monitoring of each energy storage component status information.

VED 500K-1044kWh-F

Technical Parameters



Model	VED 500K-1044kWh-F	VED 1MW-2MWh-F	VED 1.5MW-3MWh-F
Battery Side			
Battery Type	LFP		
Module Energy	20.09kWh		
Number of Battery Module	52 Modules	104 Modules	156 Modules
Total Energy	1044kWh	2088kWh	3132kWh
Operating Voltage Range	728-936V		
Max. Charge/Discharge Current	0.5P		
Module Dimension(W*D*H)/Weight	483*941*261 mm/147kg		
AC Side (On Grid)			
Rated AC Power	500kW	500kW*2	500kW*3
Max. AC Power	550kW	550kW*2	550kW*3
Rated AC Current	720A	720A*2	720A*3
Rated AC Voltage	400V,3W+N+PE		
Rated Frequency	50/60Hz±5Hz		
THDi	< 3% (rated power)		
PF Adjustable Range	-1 leading~+1 lagging		
AC Side (Off Grid)			
Rated AC Voltage	400V		
Rated AC Frequency	50/60Hz		
THDi	< 3% (linear load)		
Overload Capacity	110%, normal operation; 120%, 1 minute		
General			
Cooling Concept	Air Conditioning(Battery Cabinet)		Smart Cooling(PCS)
Noise	<78dB		
Humidity Range(No condensation)	0-95%		
Altitude	3000m(>2000m Derating)		
Isolation Mode	Isolation transformer		
Fire Protection	Aerosol, Perfluoro(optional)		
Communication	RS485/CAN/Ethernet		
Temperature Range	-30~60℃(derating above 45℃)(PCS)	-20℃ to 55℃(Battery Cabinet)	
IP Rating	IP55		
Dimension(W*D*H)	1350*1450*2300mm(PCS)	1200*1523*2300mm(Battery Cabinet)	
Weight	Approx. 2200kg(PCS)	Approx. 2914kg(Battery Cabinet)	
Standard	VDE-AR-N 4110/CE-EMC/IEC62619/IEC 62477/IEC 63056 IEC 61000/IEC 62477-1:2012/IEC 61727/IEC 62116/GB/T 34120; EN 61000-6-1/EN 61000-6-2/EN 61000-6-3, GB/T 34133		
Transport Testing Requirement	UN38.3		



C&I ESS Solution

VED Series — Liquid cooled

Features and Advantages

-  **High performance**

 - C4 corrosion resistant rating
 - Wide temperature range: -20~55°C suitable for severe cold and hot weather.
-  **Safe and Reliable**

 - High-quality LFP batteries.
 - Equipped with a comprehensive fire protection system including smoke, heat, and water detection + suppression (aerosol).

-  **High Economy and Efficiency**

 - Supports long-term backup power
 - Supports peak-valley arbitrage.
-  **High intelligence**

 - Supports virtual power plants
 - Configure local control and remote monitoring platform.
 - Real-time collection and monitoring of each energy storage component status information.

VED 500k-1044kWh-L

Technical Parameters



Model	VED 500k-1044kWh-L		VED 1MW-2MWh-L	
Battery Side				
Battery Type	LFP			
Module Energy	52.2kWh			
Number of Battery Module	20Modules		40Modules	
Total Energy	1044kWh		2088kWh	
Operating Voltage Range	728-936V			
Max. Charge/Discharge Current	0.5P			
Module Dimension(W*D*H)/Weight	1140*790*244mm/330±10kg			
AC Side(On Grid)				
Rated AC Power	500kW		1000kW	
Max.AC Power	550kW		1100kW	
Rated Grid Output Current	720A		1440A	
Rated Grid Voltage	400V(-15%~+10%), 3W+PE/3W+N+PE			
Rated Frequency	50/60Hz(±5Hz)			
THDi	<3%(rated power)			
Power Factor	-1(leading) ~ +1(lagging)			
General				
Cooling Concept	Liquid Cooling(Battery Cabinet)		Smart Cooling(PCS)	
Noise	<78dB			
Humidity Range(No condensation)	0-95%			
Altitude	3000m (>2000m Derating)			
Isolation Mode	Isolation transformer			
Fire Protection	Aerosol			
Communication	RS485/CAN/Ethernet			
Temperature Range	-30~60°C(derating above 45°C)(PCS) -20°C to 55°C(Battery Cabinet)			
Anti-corrosion Grade	C4(C5 Optional)			
IP Rating	IP55			
Dimension(W*D*H)	1350*1450*2300mm(PCS)		1300*1000*2300mm(Battery Cabinet)	
Weight	Approx. 2200kg(PCS)		Approx. 2075kg(Battery Cabinet)	
Standard	VDE-AR-N 4110/CE-EMC/IEC62619/IEC 62477/IEC 63056 IEC 61000/IEC 62477-1:2012/IEC 61727/IEC 62116/GB/T 34120; EN 61000-6-1/EN 61000-6-2/EN 61000-6-3, GB/T 34133			
Transport Testing Requirement	UN38.3			

Small C&I ESS Solution

VED Series – All in One



Features and Advantages

Safe and Reliable

- Overvoltage and overcurrent protection for cells, packs, battery systems, and PCS.
- Multi-level fire protection design

High performance

- The entire cabinet integrates PCS, BMS, and EMS.
- Temperature difference less than 3°C

Easy Installation

- Modular integrated design, factory pre-installed and tested.
- Plug-and-play for on-site installation, easy connection, and simple configuration.

High intelligence

- Equipped with Vestwoods cloud platform
- Real-time monitoring and alerts;
- 24/7 remote maintenance available.

VED 125k-261kWh-L

Technical Parameters



Model	VED 125k-261kWh-L
Battery Side	
Battery Type	Li-ion(LFP)
Cell Capacity	314Ah
Module Capacity	52.24kWh
Nominal Capacity	261kWh
Module Quantity	5
Operation Voltage Range	728-936V
Cycle Life	6000 Cycles @80%DOD, 25°C
Max.Charge/Discharge Current	0.5P
AC Side	
Rated AC Power	125kW
Max.AC Power	137.5kW
Rated AC Current	180A
Rated Grid Voltage	400V(-15%~+10%), 3W+PE/3W+N+PE
Rated Grid Frequency	50/60Hz(±5Hz)
Power Factor	<3%(rated power)
THDi	-1(leading) ~ +1(lagging)
General	
Cooling Concept	Liquid Cooling
Noise	<75dB(1m)
Operating Humidity(No condensation)	≤95%RH
Altitude	<3000m
Fire Protection	Aerosol, Perfluoro(optional)
Communication	RS485/CAN/Modbus TCP/RTU
Operating Temperature Range	-20°C~55°C(>45°C derating)
Anti-corrosion Grade	C4(C5 option)
Ingress Protection	Battery Pack: IP65 Cabinet: IP55
Dimension(W*D*H)	1000*1450*2300mm
Weight	Approx. 2500kg
Standard	IEC62619, IEC62477, CE-EMC, IEC63056
Transport Testing Requirement	UN38.3

Utility-Scale ESS Solution

VES Series



Features and Advantages

Safe and Reliable

- Utilizing lithium iron phosphate batteries with abuilt-in multi-level protection system ensuresexceptional thermal stability.
- The system integrates an advanced fire protection system and achieves IP55 protection rating.

High Economy and Efficiency

- The optimized thermal management system extends product lifespan, lowers operating costs.and delivers a higher return on investment throughout the product lifecycle.

Plug-and-Play, Rapid Deployment

- Integrated design, PCS、BMS、EMS Integrated Full container shipping and installation.
- Significantly reduces installation time andcommissioning costs.

High intelligence

- Supports real-time online monitoring of system status.

VES 1MW-2MWh-F2

Technical Parameters



Model	VES 1MW-2MWh-F2
Battery Side	
Battery Type	LFP
Cell Specifications	314Ah/3.2V
Battery Module Grouping Method	1P18S
Battery Module Capacity	18.08kWh
Battery Cluster Grouping Method	1P252S
Battery Cluster Capacity	253kWh
Battery Stack Grouping Method	8P252S
Battery Stack Capacity	2025kWh
Battery Voltage Range	706-908V
Rated Charge and Discharge Rate	0.5P/0.5P
AC Side(On Grid)	
AC Side Rated Power	125*8 kW
Rated Voltage	400Vac
Rated Frequency	50/60Hz(±5Hz)
Rated Current	1443A
Power Factor	0.99/-1~1
Output THDi	<3%
General	
Cooling Method	Air Conditioning
Fire Protection Configuration	Combustible gas detection/explosion-proof exhaust/gas fire fighting/water fire fighting
Noise	<70dB (at 1m)
Anti-corrosion Level	C4 (C5 optional)
Protection Level	IP55
Altitude	3000m (>2000m derating)
Temperature Range	-30°C-50°C
Humidity Range	0-95% (no condensation)
Communication	RS485/CAN2.0/Dry contact
Certification	IEC62619, GB/T36276, EN50549-2, VDE4110, VDE4120, G99, IEC62477/61000, etc.
Dimension(W*D*H)	6058*2438*2896mm
Total System Weight	Approx. 20t

C&I CASE

50kW / 197kWh

Application scenarios: Factory

Application mode: Peak Shaving + PV consumption



670kW / 500kW / 1000kWh

Application scenarios: Poultry Farm

Application: Microgrid with DC



130kW / 100kW / 394kWh

Application scenarios: Hotel

Application Mode: PV Consumption + Emergency Back Up



320kW / 788kWh

Application scenarios: Micro-Grid

Application Model: Self-consumption & Emergency Power Supply



120kW / 100kW / 394kWh

Application scenarios: School

Application Modet: PV consumption + Emergency back up



240kW / 591kWh

Application scenarios: African Independent Television

Application Modet: Self-consumption & Emergency Power Supply



80kW / 197kWh

Application scenarios: Private Villa

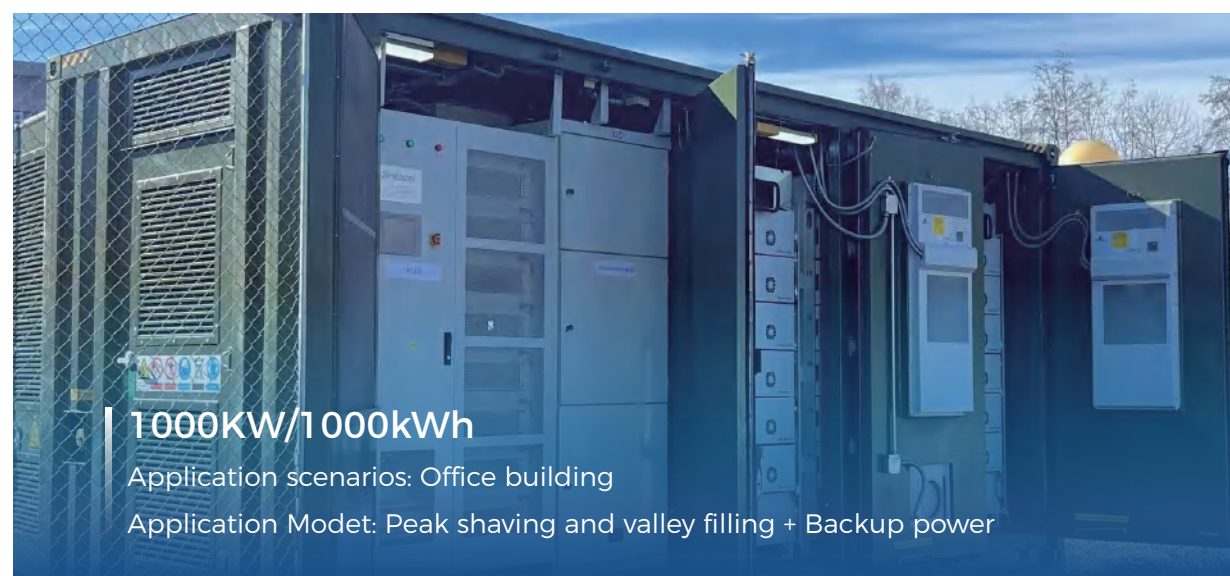
Application Modet: PV consumption + Emergency back up



135kW / 200kW / 430kWh

Application scenarios: Hotel

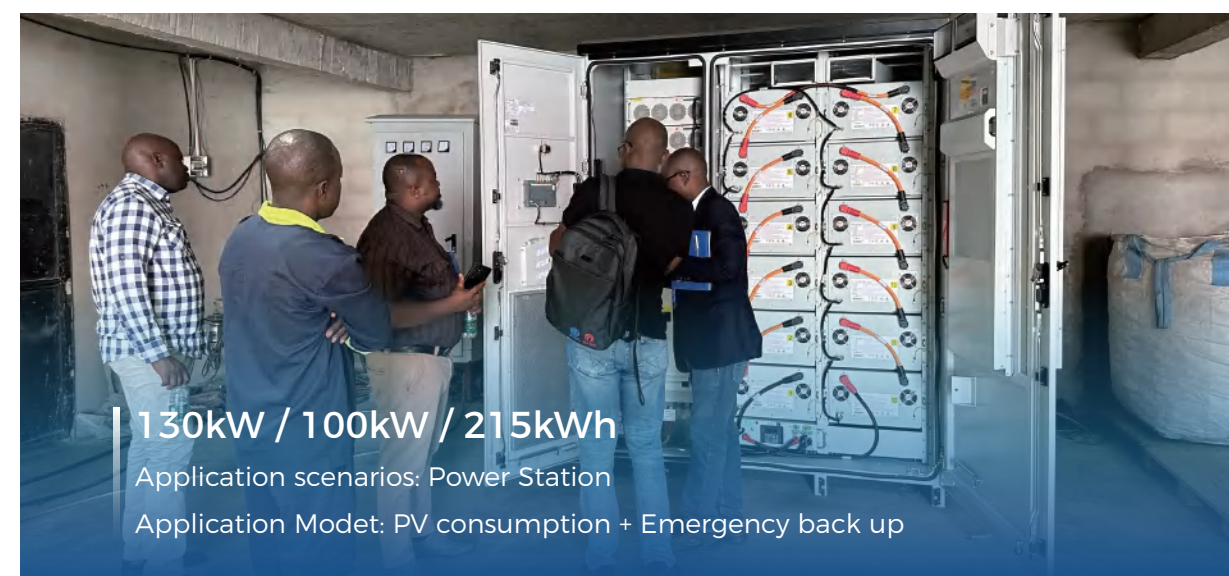
Application Modet: PV consumption + Emergency back up



1000KW/1000kWh

Application scenarios: Office building

Application Modet: Peak shaving and valley filling + Backup power



130kW / 100kW / 215kWh

Application scenarios: Power Station

Application Modet: PV consumption + Emergency back up