

**HOPEWIND**

Stock Code: SSE-603063



# Energy Storage Product Brochure



# “ About Hopewind

Shenzhen Hopewind Electric Co., Ltd. (Stock Code: 603063) focuses on the R&D, manufacturing, sales and services of renewable energy & variable frequency drive products, including products for wind power generation, photovoltaic generation, energy storage, hydrogen production power supply, power quality and variable frequency drive. Furthermore, Hopewind owns integrated independent R&D and testing platforms of high-power power electrical equipment and monitoring systems. Through innovation in technology and service, Hopewind continuously creates value for customers, and has become one of China's most competitive enterprises in the renewable energy field.

In the field of power conversion system, Hopewind provides competitive common AC/DC energy storage overall solutions, includes string power converter system, string turnkey PCS station, complete energy storage systems and other products.

Provide competitive overall solutions for common AC or common DC energy storage systems.



Headquarter · Shenzhen

5 R&D and manufacturing bases: Shenzhen, Suzhou, Xi'an, Heyuan, Wuhan

30+ global service bases: Deployed worldwide to provide comprehensive services for global customers

## » Content



06

String PCS  
ESHV145K/250K-A-G01  
ESHV215K-LI-G01  
ESNV130K-AI-G01

12

String PCS Turnkey Station  
HPPS-1250/2500/3000B

14

Overview of Storage EMS

16

Project Cases





## Grid side, Generation side, User Side

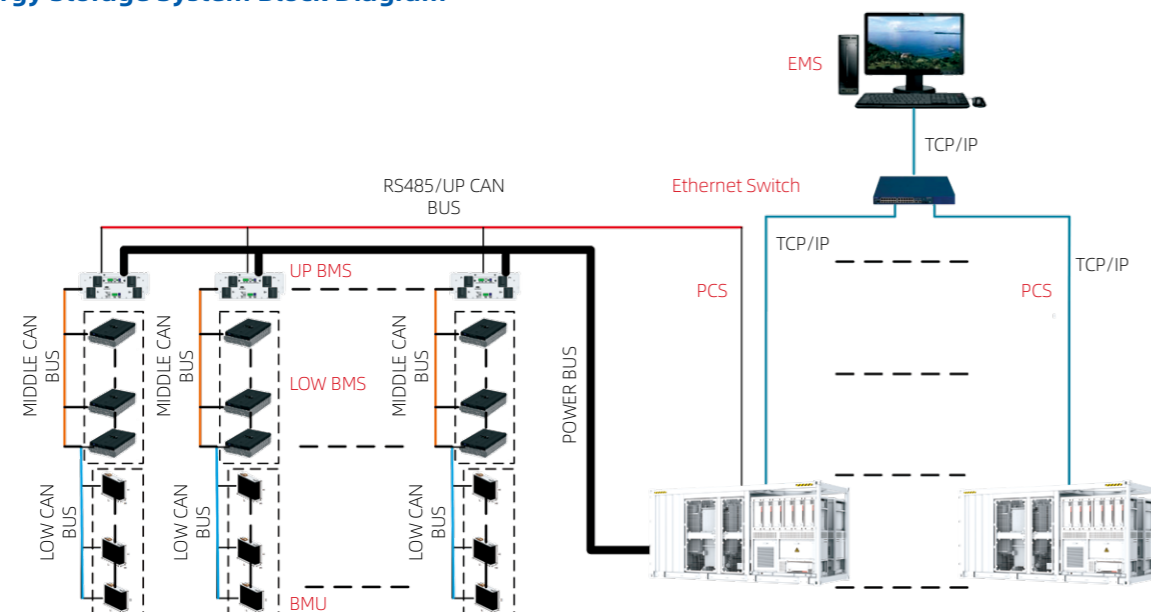
By adding the energy storage system in the power grid, it can realize peak load shifting, frequency and peak adjustment, smooth the power generation and user side's energy as well as improve the quality of the power grid.

Specifically including:

1. Realize primary frequency modulation and secondary frequency modulation control, monitor load fluctuations in real time, respond quickly to grid dispatching, improve grid frequency stability, and improve grid quality.
2. Improve the instability of the output power of wind power/photovoltaic power stations, especially the impact of transient power on the power grid, thereby improving the power quality of new energy power stations and power grids.
3. Reduce the fluctuation instability of the user side power, smooth the power, improve the utilisation of user side capacity, and reduce the transformer capacity and the basic electricity cost of the user side.
4. According to the difference between the peak and lowest electricity prices, the PCS charges when the electricity price is low, and discharges when the electricity price is high to obtain certain economic benefits.

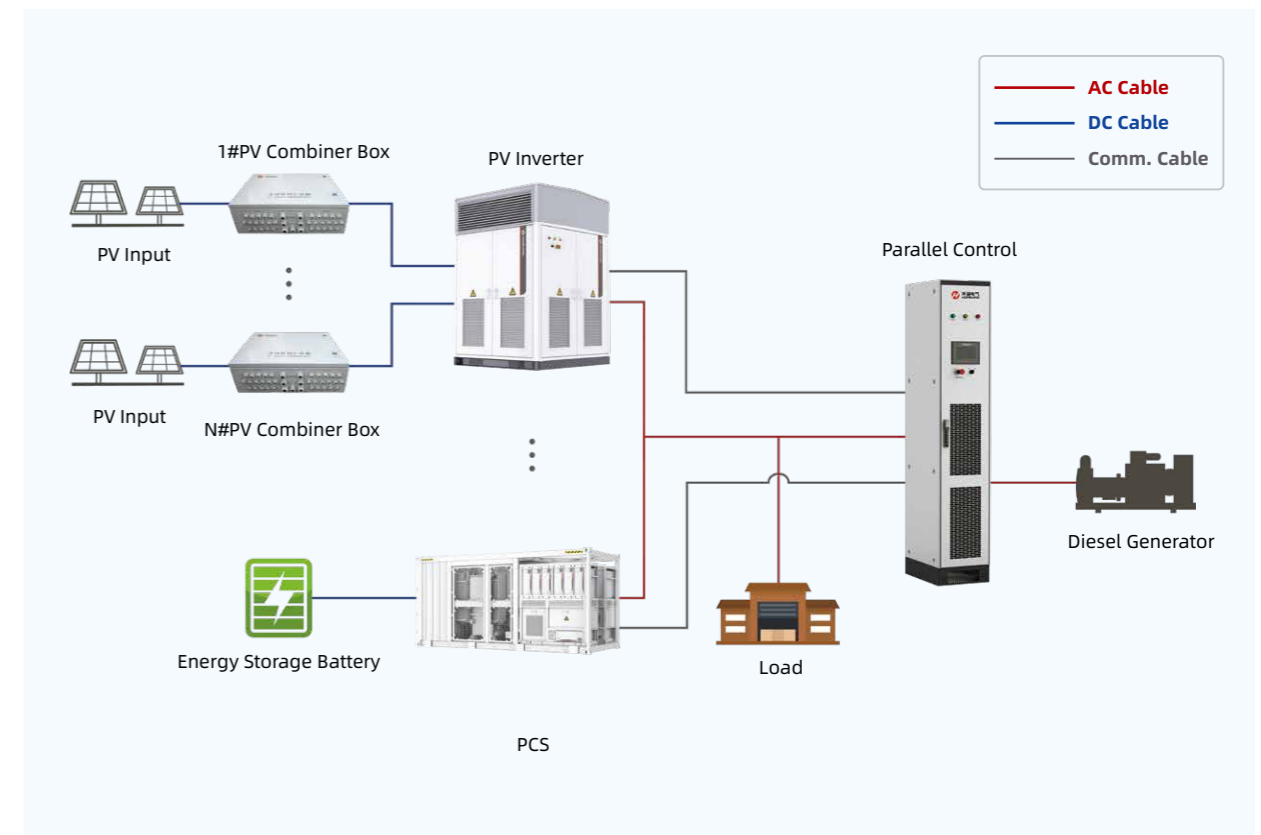
An energy storage system includes an energy storage battery, a power conversion system (PCS), a box-type transformer, an energy management system (EMS), and a battery management system (BMS).

## Energy Storage System Block Diagram



## Off-grid/Micro-grid Application

The energy storage system can be combined with new energy power generation system (such as wind power and photovoltaic power) and diesel generator system to form an off-grid or micro-grid system to solve the electricity demand of users in islands or remote areas of power grids with unstable power supply.



In the above micro-grid system:

1. Select the capacity of the PCS according to the required power of the load. If the power of the load is large and multiple PCSs are needed for expansion, the parallel control cabinet is required.
2. The isolation transformer can be placed independently on the outside or built in the PCS.
3. When off-grid operation, PCS acts as a voltage source to supply power to the load, while it absorbs energy from the PV, the excess is charged into the storage battery.
  - (1) When the power of the PV input port of the PCS is less than the AC output power, the energy storage battery begins to discharge.
  - (2) When the energy storage battery is discharged to a certain extent and may be difficult to support the load, the diesel is turned on, and the PCS is switched from the off-grid operation to on-grid operation connected to DG and supply power.
  - (3) When the power of the PV input is increased to above the load power, the diesel is turned off, and the PCS is automatically switched to the off-grid operation.

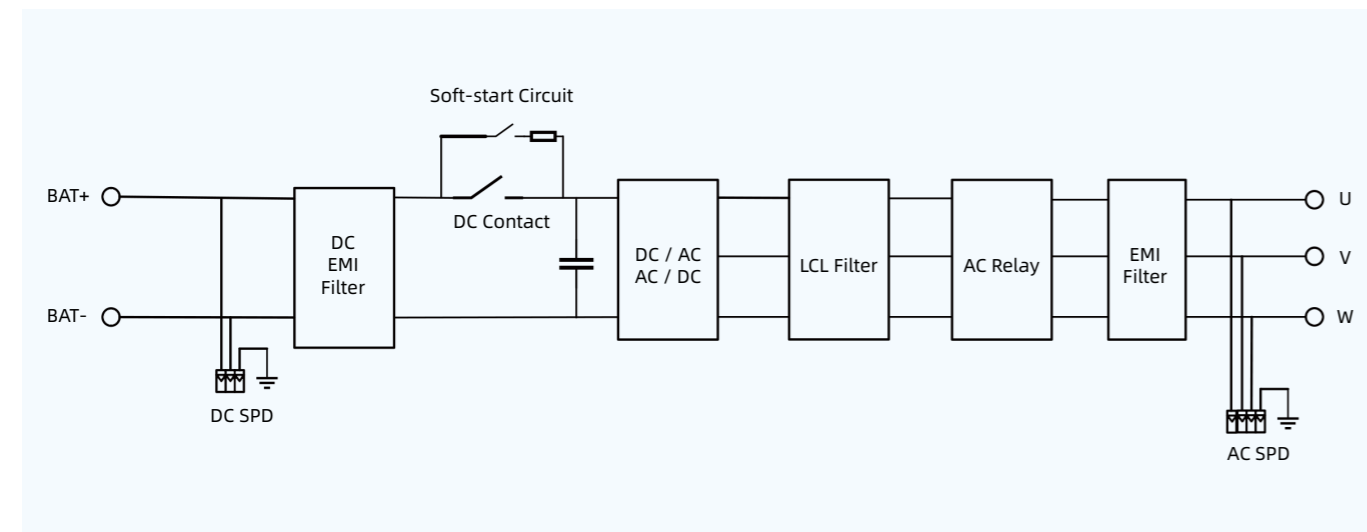
# >> String PCS ESHV Series

## Features

- Small size & high power density
- Modular design enables accurate management of battery
- IP66 & optional C4~C5 anti-corrosion degree for harsh environment
- Supports multi-module parallel connection, Flexible configuration
- PQ, VSG and other functions



## Product Principle



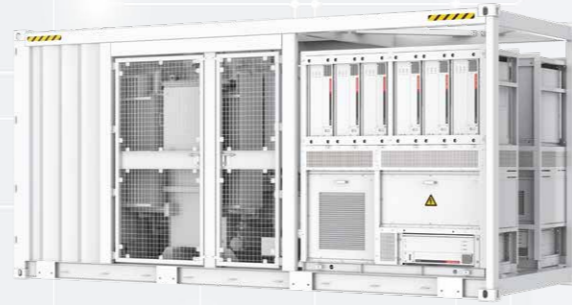
## Specifications

Model		ESHV145K-A-G01	ESHV250K-A-G01
DC Input	DC Voltage Range	580V~1500V	1000V~1500V
	Max. DC Current	281A	
AC Output	Rated Power	145kW	250kW
	Max. Output Power	160kW	275kW
	AC Connection	3W+PE	
	Isolation	Non-isolation	
On-Grid	Rated Grid Voltage	400V	690V
	Voltage Range	340V~440V	586.5V~759V
	Rated Grid Frequency	50Hz / 60Hz	
	Frequency Range	45Hz~55Hz / 55Hz~65Hz	
	THDi	<3% (At rated power)	
	Power Factor	-1~1	
	Charge-Discharge Conversion Time	<20ms	
Off-Grid	Rated Output Voltage	400V	690V
	Voltage Imbalance	<2%, No more than 4% in a short period of time	
	THDu	<3% (No load or rated resistive load)	
	Voltage Transient Range	<10% (Resistive load/balanced load. Load change suddenly from 20% to 100% or from 100% to 20%)	
	Oversvoltage Protection	Settable value	
	Undervoltage Protection	Settable value	
	Ground System	IT	
General Data	Operating Ambient Temperature Range	-40°C~+60°C (Derating above 45°C)	
	Allowable Relative Humidity Range	0~100%	
	Allowable Altitude Range	<4000m (Derating above 3000m)	
	Noise Level	75dB	
	DI Port	4 pairs	
	DO Port	2 pairs	
	Anti-Corrosion degree	C4 (C5 is optional)	
	Surge Protection	DC Type II / AC Type III	
	Wiring Method	Bottom in and bottom out (Quick plug terminal)	
	Protection Degree	IP66	
	Cooling Method	Smart air-cooling	
	Indicator	LED indicator	
	Communication Interface	Ethernet, RS485, CAN, Local debugging WiFi (Optional)	
Communication Protocol	Modbus TCP / RTU		
Dimensions (W*H*D)	795*915*294mm (Excludes hanging board)		
Weight	≤100kg (Net weight)		
Standard Compliance	IEC 62477-1	GB / T 34120-2023, GB / T 34133-2023, EN 50549-1/-2, IEC 62477-1, IEC 61000	

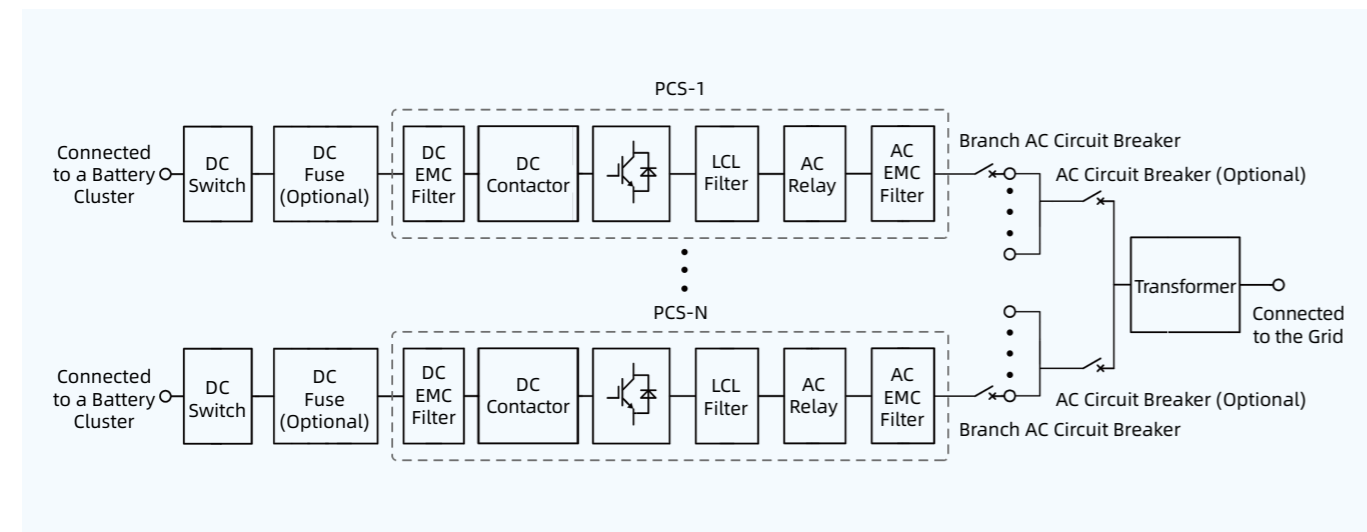
# >> String PCS Turnkey Station HPPS Series

## Features

- Rack-level management for batteries to address the issue of circulating current in parallel connections
- Modular design to prevent single point of failure
- Use of the three-level technology
- Strong environmental adaptability with C4~C5 anti-corrosion degree available, and no derating at 45°C ambient temperature
- Flexible capacity configuration and customizable MV voltage level of 6~35kV
- Multiple operation modes supported such as PQ and VSG



## Product Principle



## Specifications

Model		HPPS-1250B	HPPS-2500B	HPPS-3000B
DC Parameters	Number of DC Input Channels	6	12	14
	Max. DC Current	281A × 6	281A × 12	281A × 14
	DC Voltage Operating Range	1000V~1500V		
AC Parameters	Total Rated Power	1250kW	2500kW	3000kW
	Max. Output Power	1375kVA	2750kVA	3300kVA
	Rated Voltage	690Vac		
	Isolation Mode	Transformer Isolation		
	Reactive Power Range	0~1312.5kvar	0~2625kvar	0~3150kvar
On-grid Mode	Rated Grid Voltage	6~35kV (Customizable)		
	Rated Grid Frequency	50Hz / 60Hz		
	THDi	<3%		
	Power Factor	-1~1		
	Rated Capacity	1250kVA	2500kVA	3000kVA
Transformer Parameters	Transformer Type	Oil-immersed Transformer		
	LV/MV Voltage	0.69 / (6~35)kV		
	Dimensions (W*H*D)	6058*2896*2438mm		
System Parameters	Operating Temperature	-40~+60°C (Derating above 45°C)		
	Operating Humidity	0~100%		
	Operating Altitude	≤4000m (No derating within 3000m)		
	Protection Degree	IP54 (PCS IP66)		
	BMS Communication	RS485 / CAN		
	EMS Communication	Ethernet Interface		
	Communication Protocol	Modbus RTU / Modbus TCP / IEC104 / IEC61850		
	Standard Compliance	GB/T 34120, IEC62477, IEC61000, EN50549		
	Grid Support	H/LVRT, frequency adjustment function, voltage adjustment function, inertia response, etc.		

\*The table only lists some models. Products can be customized for projects.



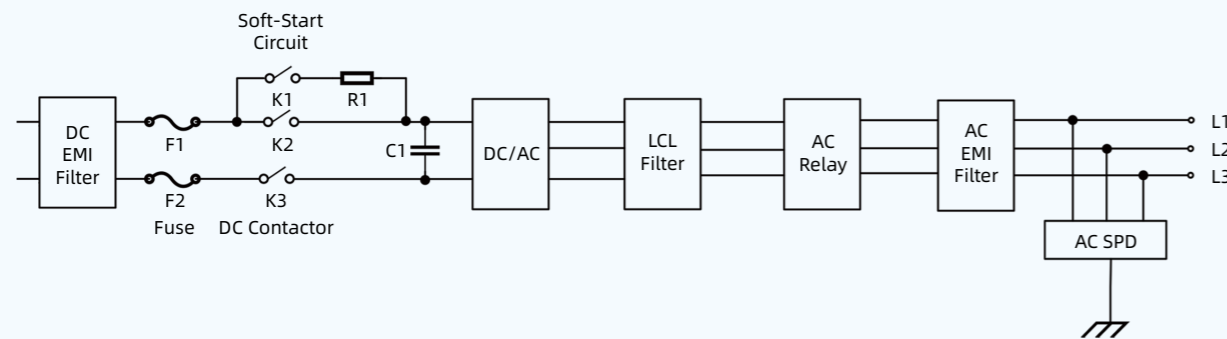
# >> String PCS ESHV Series

## Features

- Highly Integrated design with battery rack high voltage box
- Three-level technology
- Liquid-cooling for lower loss
- Small size & high power density
- IP66 protection degree for harsh environment
- Supports multi-module parallel connection, enabling accurate management of battery
- PQ, VSG and other functions



## Product Principle



## Specifications

	Model	ESHV215K-LI-G01
DC Input	DC Voltage Range	1000V~1500V
	Max. DC Current	241A
AC Output	Rated Power	215kW
	Max. Output Power	236.5kW
	Reactive Power Range	0~236.5kvar
	AC Connection	3W+PE
On-Grid	Isolation	Non-isolation
	Rated Grid Voltage	690V
	Voltage Range	586V~759V
	Rated Grid Frequency	50Hz / 60Hz
	Frequency Range	47Hz~53Hz / 57Hz~63Hz
	THDi	<3% (At rated power)
	Power Factor	-1~1
	Charge-Discharge Conversion Time	<20ms
Off-Grid	Rated Output Voltage	690V
	Voltage Imbalance	<2%, No more than 4% in a short period of time
	THDu	<3% (No load or rated resistive load)
	Voltage Transient Range	<10% (Resistive load/balanced load. Load change suddenly from 20% to 100% or from 100% to 20%)
	Overvoltage Protection	Settable value
	Undervoltage Protection	Settable value
General Data	Ground System	IT
	Operating Ambient Temperature Range	-40°C~+60°C
	Allowable Relative Humidity Range	0~95%
	Allowable Altitude Range	<4000m (Derating above 3000m)
	Noise Level	<70dB
	Anti-Corrosion Degree	C4 (C5 is optional)
	Cooling Method	Liquid-cooling
	Allowable Coolant Temperature	-40°C~+73°C (Derating above 58°C)
	Wiring Method	Quick plug terminal
	Protection Degree	IP66
	Indicator	LED indicator
	Communication Interface	Ethernet, RS485
	Communication Protocol	Modbus TCP / RTU
	Dimensions (W*H*D)	745*820*180mm (Excludes hanging board) 785*820*180mm (Includes hanging board)
Weight	≤80kg (Net weight)	

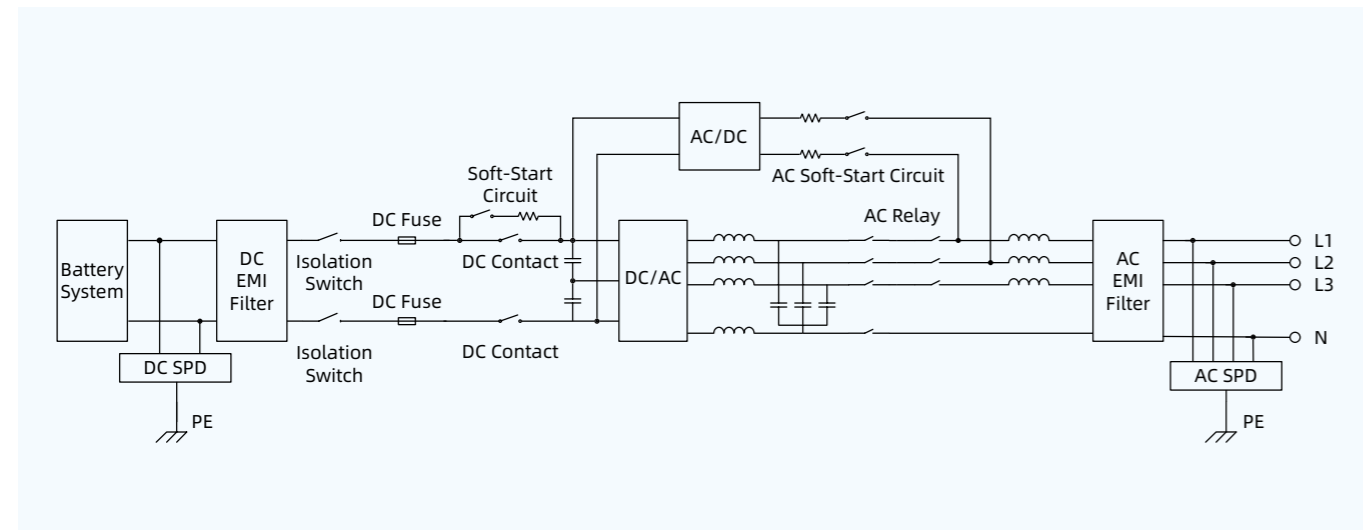
# >> String PCS ESNV Series

## Features

- Highly Integrated design with battery rack high voltage box
- Three-level technology
- Three-phase four-leg design, support 100% unbalanced load
- IP66 protection degree for harsh environment
- Supports multi-module parallel connection, enabling accurate management of battery
- PQ, VSG and other functions



## Product Principle



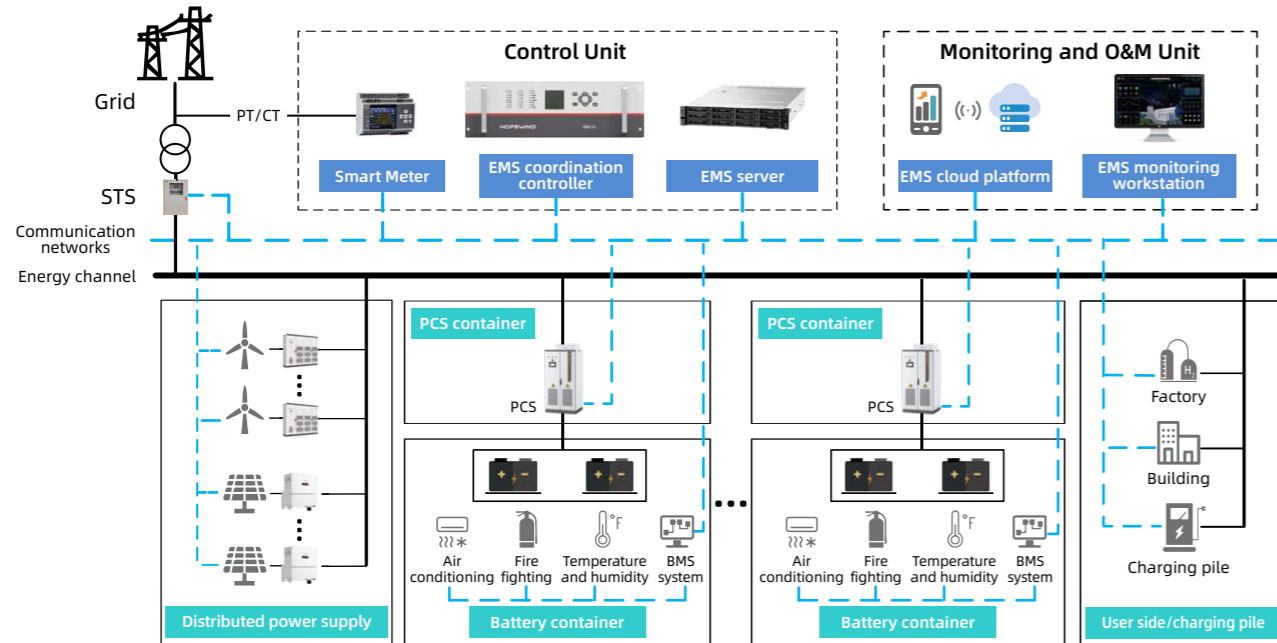
## Specifications

Model		ESNV130K-AI-G01
DC Input	DC Voltage Range	650V~950V
	Max. DC Current	230A
AC Output	Rated Power	130kW
	Max. Output Power	143kW
	Reactive Power Range	0~136.5kvar
	AC Connection	3W+N+PE
	Isolation	Non-isolation
On-Grid	Rated Grid Voltage	400V
	Voltage Range	340V~440V
	Rated Grid Frequency	50Hz / 60Hz
	Frequency Range	46.5Hz~51.5Hz / 56.5Hz~61.5Hz
	THDi	<3% (At rated power)
	Power Factor	-1~1
	Charge-Discharge Conversion Time	<20ms
Off-Grid	Rated Output Voltage	400V
	Voltage Imbalance	<2%, No more than 4% in a short period of time
	THDu	<3% (No load or rated resistive load)
	Voltage Transient Range	<30% Within 100ms, <10% After 100ms <10% (Resistive load/balanced load. Load change suddenly from 20% to 100% or from 100% to 20%)
	Overvoltage Protection	Settable value
	Undervoltage Protection	Settable value
	Ground System	TT / TN
General Data	Operating Ambient Temperature Range	-40°C~+60°C (Derating above 45°C)
	Allowable Relative Humidity Range	0~95%
	Allowable Altitude Range	<4000m (Derating above 3000m)
	Noise Level	70dB
	Anti-Corrosion Degree	C4 (C5 is optional)
	Surge Protection	Type II Surge Protective Device (8 / 20μs)
	Wiring Method	Quick plug terminal
	Protection Degree	IP66
	Indicator	LED indicator
	Communication Interface	Ethernet, RS485, CAN
	Communication Protocol	Modbus TCP / RTU, CAN
	Dimensions (W*H*D)	807*643*267mm (Excludes hanging board)
	Weight	Approx. 85kg (Net weight)

# >> Overview of Storage EMS

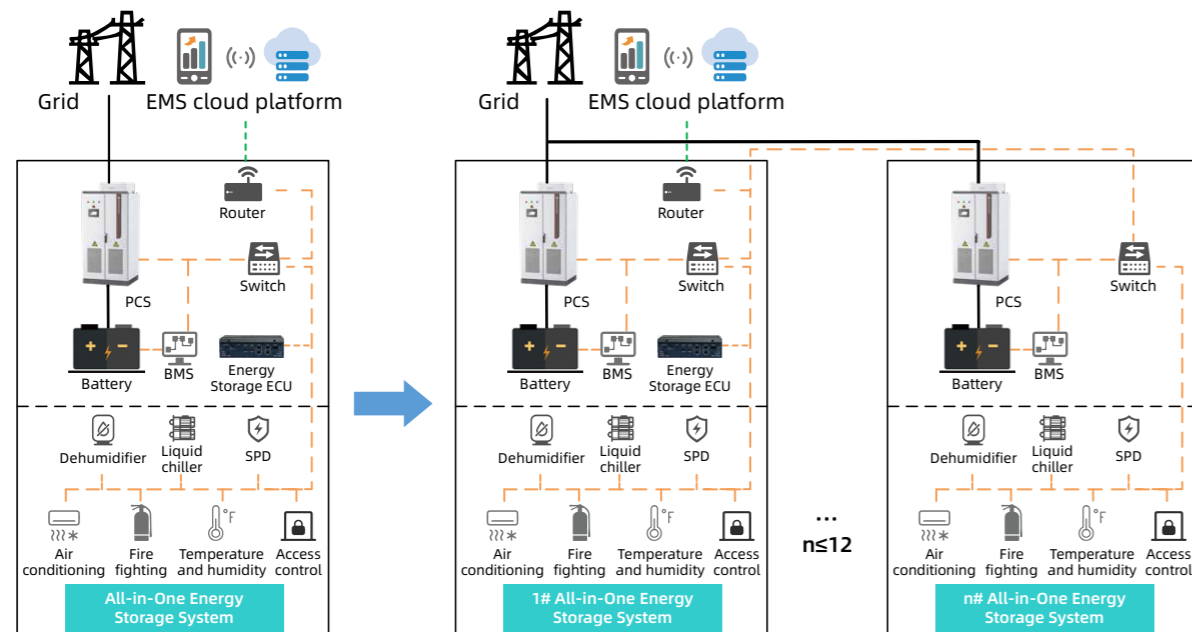
## Topology of the Energy Storage/Micro-grid EMS

Hopewind EMS works in various scenarios like energy storage, distribution, and micro-grid. It supports energy dispatching of multiple sources such as power supplies, grids, loads, and storage, and coordinated control of multiple equipment. In addition, the EMS provides comprehensive operation and maintenance solutions including local monitoring and cloud platform.



## Topology of the All-in-One Energy Storage EMS

The all-in-one solution integrates batteries, energy storage converters, auxiliary control devices, BMS, and EMS into a single cabinet. The energy of the energy storage unit can be controlled by configuring the ECU. The solution supports parallel connection and coordinated control of multiple units.



## Hopewind Cloud Platform

### Big Data Center

By establishing "analysis models" and "intelligent decision-making algorithms" for energy big data, the big data center deeply optimizes the accuracy and performance of algorithms through long-term mass data computation and training, providing precise decision-making support for energy operation enterprises.

### Energy IoT Platform

The energy IoT platform supports fast connection with self-developed and third-party devices, implementing status perception, remote control, and data collection of energy equipment in areas such as wind, solar, storage, hydrogen, and energy consumption.

### Energy PaaS Management Platform

Implementing functions such as platform application management, tenant management, system management, equipment management, and statistical analysis of data.



### Energy SaaS Application Platform

Building energy solutions in niche areas such as distributed energy management, household energy consumption, micro-grid, and zero-carbon parks to meet users' energy operation needs.

## Monitoring by Hopewind Energy Storage EMS Cloud Platform





# >> Project Cases



> 25MW/50MWh C&I energy storage project in Fuyang, Anhui province



> 25MW/50MWh generator-side energy storage project in Wanning, Hainan province



> 57.5MW/115MWh Generator-side energy storage project in Xiantiao city, Hubei province



> 60MW/120MWh Generator-side energy storage project in Alxa League, Inner Mongolia



> 23MW/46MWh generator-side energy storage project in Lianshui, Jiangsu province



> 52.5MW/105MWh shared energy storage project in Yueqing, Zhejiang province



> 100MW/200MWh energy storage project in Weng'an, Guizhou province



> 50MW/100MWh Generator-side energy storage project in Hulun Buir city, Inner Mongolia



> 50MW/100MWh Independent energy storage project in Wuzhong city, Ningxia



> 100MW/200MWh Energy storage peak regulation demonstrative project in Jining city, Shandong province



> 150MW/300MWh energy storage project in Yinchuan, Ningxia



> 154MW/308MWh energy storage project in Jiayuguan, Gansu province



> 100MW/200MWh energy storage project in Anshun, Guizhou province



> 100MW/200MWh energy storage project in Luodian, Guizhou province



> 100MW/200MWh energy storage project in Dongming, Shandong province



> 100MW/200MWh energy storage project in Zhucheng, Shandong province



# >> Project Cases



> 120MW/240MWh energy storage project in Alashan, Inner Mongolia



> South Korea 12MW/36MWh Photovoltaic Energy Storage Project



> Yunnan Microgrid Project



> Supercapacitor Energy Storage



> 15MW/7.5MWh Thermal-energy Storage Frequency Modulation Project in a Power Plant in Shanxi Province



> 25MW/50MWh generator-side energy storage project in Ledong, Hainan province



> User-side Energy Storage + UPS Project



> 1MW Flywheel System Integration



> 40MW/80MWh Generator-side energy storage project in Jiuquan city, Gansu province



> Industrial energy storage project in Karamay city, Xinjiang autonomous region



> Energy storage EMS project in Jiangyin City, Jiangsu Province



> Wind power distribution and storage EMS project in Luohe City, Henan Province



> Huizhou 3MW/6MWh 973 National Major Project



> 3MW/31MWh Energy Storage Power Station in Changxing, Zhejiang Province



> Micro-grid EMS project in Fangshan District, Beijing



> Energy storage EMS project of a metal factory in Jiangyin City, Jiangsu Province



# ***150 GW<sup>+</sup>***

## ***SHIPMENTS WORLDWIDE***



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If the product size and parameters have changed, the latest actual product shall prevail