

YiLiNK



V1.0

**125kW/241kWh
Industrial and Commercial ESS
Product Specification**

Product Information

Product Name	YiLink EnergyHub241 Industrial and Commercial ESS
Product Spec	ESS: 125kW/241kWh Charging gun: 200kW max

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1 - Product Overview and Main Technical Parameters

1.1 Product Overview

The YiLink EnergyHub241 DC storage and integrated charging pile (hereinafter referred to as the "storage and charging pile") consists of a 125kW/241kWh energy storage system and a 200kW dual gun DCDC charging system.

The energy storage system consists of batteries, battery management systems (BMS), energy storage inverters (PCS), energy management systems (EMS), power distribution, fire protection, and air conditioning auxiliary systems, and can operate in parallel off grid mode.

The charging system adopts a 45kW high-performance DCDC charging module, with a DC output range of 200-1000V to accommodate various charging vehicles. It is fully compatible with mainstream platforms, supports multiple startup modes, dual gun parallel charging, remote fault diagnosis, controller OTA upgrade and other functions, providing "time-saving, energy-saving, and worry free" products for the entire charging scene.

1.2 Main Technical Parameters

Product Model	YiLink EnergyHub241
Project	Parameters
Basic Specifications	
Energy Storage/Charging Gun Rated Power	125kW/200kW Max.
Battery Capacity	241kWh
Cooling Method	Intelligent Liquid Cooling
Net Weight	3.0t
Dimensions (W*H*D)	1600*1800*1400mm

Charging Gun	
Rated Power	200kW Max.
Number of Guns	2
Heat Dissipation Method	Intelligent Air Cooling
Backend Communication	Ethernet/4G
Display Method	7-inch Touch Screen
Startup Method	Charging Modes: QR Code/VIN/Plug & Charge/RFID Card/Manual
Input Voltage	200~850VDC(Rated 750VDC)
Input Current	0~250A
Input Constant Power Range	400~850VDC
Output Voltage Range	200V~1000VDC (Constant Power Voltage Range: 300V-1000VDC)
Maximum Single-Gun Current	250A
Maximum Single-Gun Power	200kW
Peak Efficiency	≥97%
Output Voltage Error	≤±0.5%
Output Current Error	When ≥30A, ≤±1%; When <30A, ≤±0.3A
Output Voltage Regulation Accuracy	≤±0.5%
Output Current Regulation Accuracy	≤±1%
Output Ripple Peak-to-Peak	≤±1%
Current Sharing Imbalance	≤3%
Battery	
Cell Type	LFP 3.2V/314Ah
Battery Pack Parameters	48.23kWh/1P48S
Battery System Configuration	1P240S
Battery System Capacity	241kWh
Battery Rated Voltage	768V DC
Battery Voltage Range	648~876V DC
Charge/Discharge Rate	1C
Charge/Discharge Cycles	>12000 Cycles (25℃ 0.5C Charge/Discharge 70% DOD)
Battery Cooling Method	Liquid Cooling

PCS	
Rated Power	125kW (Max.)
Maximum Power	132kW (10min)
	144kW (1min)
Rated Voltage	3*230V/400V
Allowable Grid Voltage Range	400V±15%
Rated Grid Frequency	50/60Hz
Frequency Range	47Hz~52Hz/56Hz~62Hz
Total Harmonic Distortion (THD) of Current	≤3%(At Rated Power)
DC Component	Current Ripple <0.5% of Rated Output Current
Connection Method	3P+N+PE
Power Factor	>0.99
Power Factor Range	Power Factor Range: +1 (Leading) ~ -1 (Lagging)
Off-grid Operation	Support

Efficiency	
PCS Maximum Efficiency	98.90%
Charging Peak Efficiency	>97%
System Maximum Efficiency	88.00%

Protection	
DC Reverse Polarity Protection	Equipped
AC Reverse Polarity Auto-adaptation	Equipped
Insulation Resistance Detection	Equipped
AC Overcurrent Protection	Equipped
AC Overvoltage Protection	Equipped
AC Short-circuit Protection	Equipped
Grid-side Surge Protection	Equipped
Automatic Grid Fault Transfer	Equipped
LVRT (Low Voltage Ride-Through)	Equipped
HVRT (High Voltage Ride-Through)	Equipped

Communication & HMI	
Communication Interface	RS232/RS485/WiFi/4G/Ethernet
HMI (Human-Machine Interface)	HMI: Touch Screen/Status Indicator Lights /Mobile APP

Environmental Specifications	
Protection Rating (IP Code)	IP54
Noise Level	<75dB
Operating Temperature	-25℃ ~+50℃ (Derating Required above 40℃)
Storage Temperature	-25℃ ~+55℃
Relative Humidity	5%~95% (Non-condensing)
Fire Protection Solution	Fire Suppression: Hot Aerosol
Operating Altitude	≤4000m(Altitude Derating:>2000m)

2 - System Configuration

The storage and charging system adopts the efficient and highly reliable integrated dual gun DCDC charging product. Its outstanding advantages include:

- platforms are fully compatible. Supports access to over 60 mainstream domestic platforms, supports one click switching, and does not require program updates;
- Support remote fault diagnosis, controller OTA upgrade and other functions;
- Support multiple startup modes including APP scanning, VIN code, card swiping, and password login;
- 200-1000V DC output range, accommodating various charging vehicles;
- Supporting dual charging, cross charging, and up to four charging guns of 2 charging stations simultaneously charging one vehicle;
- Excellent high-temperature performance, ensuring full load operation under high temperature conditions and fast charging;
- Multi regional environmental linkage sampling, full recording of charging logs, to ensure the safe operation of the system.

2.1 System Configuration

>>> DC Input Distribution Configuration

- Installing DC circuit breakers or fuses for the DC main input;
- The total input has measurement and display functions, with a display error of $\leq 1\%$.

>>> DC Distribution Configuration

- InThe total output of the DC system adopts fuses as protective devices;
- When the fuse and DC circuit breaker cooperate for protection, the fuse is installed on the upper level of the DC circuit breaker, and its rated current is not less than twice the rated current of the DC circuit breaker;
- The current sampling of each output branch adopts shunt sampling.

>>> Charging Module

The system is equipped with a 45kW unidirectional DCDC charging module, which has the characteristics of wide constant power range and high power density. Its main parameters are as follows:

Name	Parameters
Basic Specifications	
Dimensions (H*W*D)	85mm* 360mm* 459mm
Weight	$\leq 20\text{kg}$
Efficiency (Peak at Full Load)	$\geq 97.5\%$
Cooling Method	Forced Air Cooling
Communication Protocol	CAN Bus
Parallel Unit Capacity	≤ 60
Status Indicators	Green: Normal Operation Yellow: Protection Alarm Red: Fault Alarm (LED Digital Tube)

Input Characteristics	
Input Voltage	400Vdc ~ 850Vdc (DC Input + PE)
Input Current	$< 90\text{A}$
Constant Power Input Voltage Range	500Vdc ~ 850Vdc
Output Characteristics	
Voltage Range	50Vdc ~ 1000Vdc
Current Range	0A ~ 133.3A (Continuously Adjustable)
Rated Current	40A
Voltage Regulation Accuracy	$\leq \pm 0.5\%$ (50V-1000V, 0-20MHz)
Current Regulation Accuracy	$\leq \pm 1\%$ (20%-100% Rated Current)
Current Sharing Imbalance	$\leq \pm 3\%$
Ripple (Peak-to-Peak)	$\leq 1\%$
Environmental Conditions	
Operating Temperature	$-40^{\circ}\text{C} \sim +75^{\circ}\text{C}$ (Derating Required Above 50°C)
Storage Temperature	$-40^{\circ}\text{C} \sim +75^{\circ}\text{C}$
Relative Humidity	$< 95\%$ RH (Non-condensing)
Altitude	$\leq 2000\text{m}$: No Derating
	1000m: Requires Altitude Input (Derate 1°C Per 100m Increase)
MTBF	$> 500,000$ Hours

>>> Charging Gun

The system is equipped with a two guns, using a standard charging gun with a 5m cable length or more, which can be selected according to user's needs.

>>> Vehicle-Side BMS Power Supply

Each gun is equipped with a BMS power supply of 12V and 150W.

3 - System Technical Requirements

3.1 Overview of DC Side System

The 241kWh energy storage and charging project consists of 5 battery plug-in boxes connected in series. The battery plug-in boxes are composed of Ganfeng 3.2V/314Ah-LFP battery cells combined in a 1P48S manner.

Items	Sketch Map	Rated Voltage (V)	Rated Capacity (V)	Energy (kWh)	Notes
Cell		3.2	314	1.0048	LFP cell
Pack (with BMU)		153.6	314	48.23	1P48S
Battery Cluster ((with BCM)		768	314	214.15	1P48S *5S

3.1.1 Cell Specification Parameters

No.	Item	Parameters	Quantity
1	Cell Type	LFP	/
2	Nominal Capacity	314Ah	/
3	Nominal Voltage	3.2V	/
4	Resistance	≤0.1mΩ	5% SOC
5	Max. Continuous Discharge Rate	1C	/
6	Max. Pulse Discharge Rate	1C	/
7	Rate Discharge Capacity Ratio	≥90%	/
8	25℃ Cycle Life	≥12000 Cycle	70%SOH

3.1.2 Pack Specification Parameters

No.	Item	Parameters	Quantity
1	Connection Method	1P48S	/
2	Nominal Capacity	314Ah	/
3	Nominal Voltage	153.6V	/
4	Nominal Voltage	48.23kWh	/
5	Max. Vontinuous Discharge Rate	1C	/
6	Max. Pulse Discharge Rate	1C	/
7	Fire Protection System	40g Hot Aerosol	Warranty for 10 Years
8	Dimensions	1172*808*240mm	Tolerance: ±5mm
9	Weight	~320kg	Tolerance: ±10kg
10	IP Grade	IP67	/
11	Best Operating Temperature	10℃ ~35℃	/
12	Storage Temperature	-30℃ ~55℃	/
13	Storage Humidity	5%RH~95%RH	No Condensation

The Pack is composed of four battery modules connected in series, with a single battery module consisting of 1P12S and the entire battery plug-in box consisting of 1P48S. Each battery box has one BMU unit inside, which can collect parameter information such as cell temperature and voltage inside the battery box.

The battery plug-in box adopts liquid cooling heat dissipation, equipped with 1 liquid cooling plate, 1 hot aerosol, and also equipped with MSD maintenance switch, explosion-proof valve, and communication terminal. The reference image is as follows (subject to the actual product):



3.2 Overview of BMS

The Battery Management System (BMS) is a two-level architecture, and each battery pack is managed by a Battery Management Unit (BMU) that manages 52 strings of batteries. The BMU is responsible for collecting individual cell voltage, temperature, balancing, and other functions of the batteries. BMU uses CAN bus for communication, and the individual information of the battery (such as individual voltage, individual temperature, individual SOC, individual SOH, and equilibrium status) is transmitted through BMU for data exchange.

The battery cluster is equipped with one Battery Control Unit (BCM), which collects the total voltage and current of the battery cluster, controls the battery contactor, and performs data communication (daisy chain communication) with the upper end. The entire system is equipped with one Battery Energy Management System (EMS), which processes the battery information uploaded by the Battery Cluster Control Unit (BCM) and has functions such as display, parameter setting, fault alarm, and data recording.

[illegible]

3.2.2 BMU Specification Parameters

It can provide real-time monitoring of voltage and temperature of single battery (cell), as well as thermal management and passive balancing capabilities, and can form a highly flexible battery management system (EMS) through cascade communication with the main control unit (BCM).

Support passive balancing, using energy consumption balancing technology, can discharge multiple individual cells in the battery pack simultaneously, with a balancing current of 100mA, and the balancing energy of individual cells can be calculated. Support alarm functions for power supply/individual voltage (overvoltage, undervoltage), temperature (overtemperature), communication faults, etc; Support balanced fault detection.

3.2.3 Parameters

Item	Conditions	Parameters	Notes
Environment	Working Temperature	-20~+55℃	/
	Operating Humidity	<90%	/
	Altitude	<3000m	/
Balanced Management	Voltage Balance Range	2V~5V	/
	Battery Balancing Method	Passive Equilibrium	/
	Balanced Current	100mA	Average Current
Temperature Collection	Temperature Collection Range	-40~125℃	/
	Temperature Acquisition Accuracy	±1℃	±1℃ @ -25℃ ~65℃ ±2℃ @ -40℃ ~-25℃ or 65℃ ~125℃
Safety Regulations		UL60950, IEC 60730-1:2013, GB/T36276-2018, IEC 62477-1	/

3.3 High Voltage Box Design

The high-voltage box contains the BCM main control unit and electrical components, which are used to manage and protect the operating status of the entire battery cluster.

3.3.1 Function Description

- Supports AC~220V (or DC-24V power supply) and battery pack end DC/DC dual power supply (mains power priority);
- Support power supply to the energy storage battery management module EMS, and the power supply can be configured according to the number of EMS modules;
- Support CAN communication function with the energy storage battery management module EMS to achieve the aggregation and management of battery cluster information;
- Support LAN and CAN communication functions with the battery management system host EMS to achieve information exchange;
- Support communication control and dry contact control with energy storage inverters, and support CAN communication and RS-485 communication methods;
- Support BCM automatic addressing function;
- Support digital signal input detection, can detect switch status signals, etc;
- Support voltage detection, current detection, and insulation status detection at the end of battery clusters;
- Dimensions of high-voltage control box (width * depth * height): 600 * 600 * 200mm (excluding fixed brackets);
- Supports IP65 protection;
- The high-voltage box supports system allowable parameters: total voltage of battery cluster ≤ 1000V, maximum current of battery cluster ≤ 350A.

3.3.2 Main Control Module BCM Specification Parameters

This module manages the battery clusters in the energy storage battery system, mainly responsible for voltage and current collection of the battery clusters, summarizing the voltage and temperature information of individual cells in the clusters, calculating the SOC/SOH status of the battery clusters, executing balancing strategy judgment and battery fault diagnosis functions, and implementing on-site protection and relay control of the battery clusters based on battery fault information.

Equipped with insulation acquisition function and single SOC/SOH state calculation function, with redundant CAN communication interface, RS-485 communication interface and Ethernet communication interface, used for communication with external devices.

BCM is the core module of the energy storage battery management system, which is a key equipment to ensure the safety, reliability, efficiency, and operation of the energy storage system. The main specification parameters are as follows.

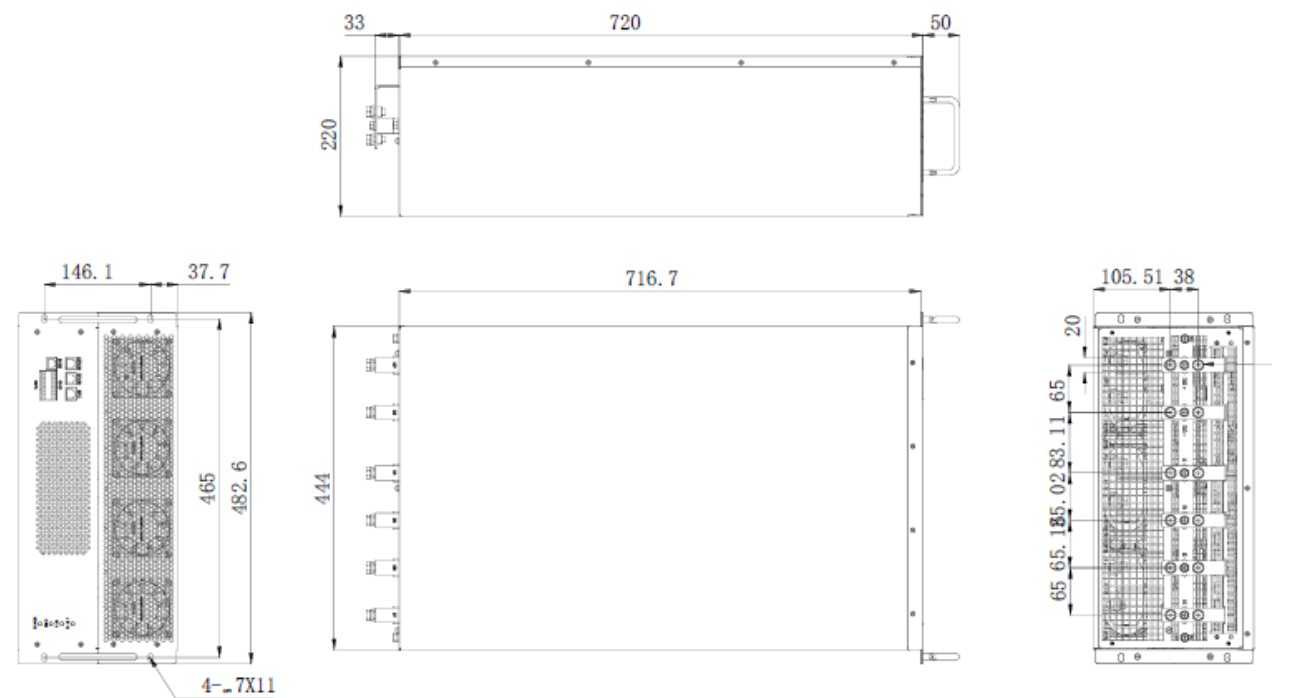
Items		Parameters	Notes
Voltage Acquisition	Voltage Range	0~1500V	/
	Acquisition Accuracy	±0.2% FS	/
Current Acquisition	Current Range	-500~500A	/
	Acquisition Accuracy	±(0.5% FS+0.5%RD)	/
Temperature Acquisition	Temp Range	-40~125℃	/
	Acquisition Accuracy	±1℃	±1℃ @-25℃ ~65℃ ±2℃ @-40℃ ~-25℃ or 65℃ ~125℃
Communication	CAN/LAN/RS485		/

3.4 Main Control Module BCM Specification Parameters

PCS is a bidirectional current controllable conversion device that connects the energy storage battery system and the power grid. Its main function is to achieve energy exchange between the battery and the power grid, and to control and manage the charging and discharging of the battery.

In grid connected mode, peak shaving and valley filling, peak shaving and frequency regulation, virtual capacity expansion, and off grid backup can be achieved for the power grid. Meanwhile, PCS also supports multiple charging and discharging modes including constant voltage, constant current, and float charging.

3.4.1 Product Dimension Diagram



3.4.2 PCS Technical Parameter

Name	Technical Parameters	Notes
DC Side Parameters		
Rated Power (kW)	125	/
Maximum Current (A)	216	/
Operating Voltage Range (V)	580~1000	/
AC Side Parameters (Grid-Connected)		
Rated AC Power (kW)	125	/
Maximum Output Power (kW)	150	/
Maximum Current (A)	217	/
Isolation Method	Non-isolated	/
Power Factor	0.99	/
Power Factor Adjustable Range	-1~+1	/
AC Side Grid-Connected Operation Parameters		
Rated Voltage (Vac)	400	/
Allowed Grid Voltage Range (Vac)	300-460	/
Rated Grid Frequency (Hz)	50/60	/
Total Voltage Harmonic Distortion Rate (THD)	<3% ((Rated Power))	/
AC Side Off-Grid Operation Parameters		
Rated Output Voltage (Vac)	400	/
AC Voltage Harmonics	<3%(Linear Load)	/
Rated Output Frequency (Hz)	50/60	/
Main Protection Characteristics		
Primary Protection Characteristics	AC Overcurrent Protection, AC Overvoltage Protection, AC Surge Protection, AC Short Circuit Protection, DC Reverse Connection Protection, DC Surge Protection	
Overall Parameters		
Number of AC Phases	Three-phase Four-wire	/
Overload Capacity	110% Long-term	Compatible with Three-phase Three-wire
Maximum Discharge Efficiency	98.9%	/
Communication Interface	CAN/RS485	/
Normal Operating Environmental Conditions		
Protection Rating	IP20	/
Operating Temperature Range	-30℃ +55℃ (Derating at >50℃)	/
Relative Humidity	0%~95%	/
Altitude	≤3000m	(Derating above 2000m)
Wiring and Airflow Direction	Rear Wiring, Front Air Inlet, Rear Air Outlet	/

3.5 Fire Protection System

3.5.1 Overview

The entire system adopts a hot aerosol fire protection system which has high fire extinguishing efficiency, low fire extinguishing concentration, and can extinguish Class B, C, and E fires. It is non-conductive, volatile, and leaves no trace residue. It can be used to protect valuable devices and storage places, and its use does not cause any damage to equipment and items.

3.5.2 Main Technical Parameters

Item	Parameters
Range of Environmental Temperature for Use	-40℃ ~+75℃
Dimensions	342mm*89mm*89mm
Relative Humidity of the Usage Environment	≤95%RH
Startup Method	Electric/Thermal Start
Starting Current	Voltage≤60V, Current≥0.7A
Spray Time	≤25s
Hot Start Temperature	180±10℃
Name of Fire Extinguishing Agent	Hot Aerosol
Protecting Space	3m³
Term of Validity	Ten years

3.6 Liquid Cooling System

3.6.1 Function Description

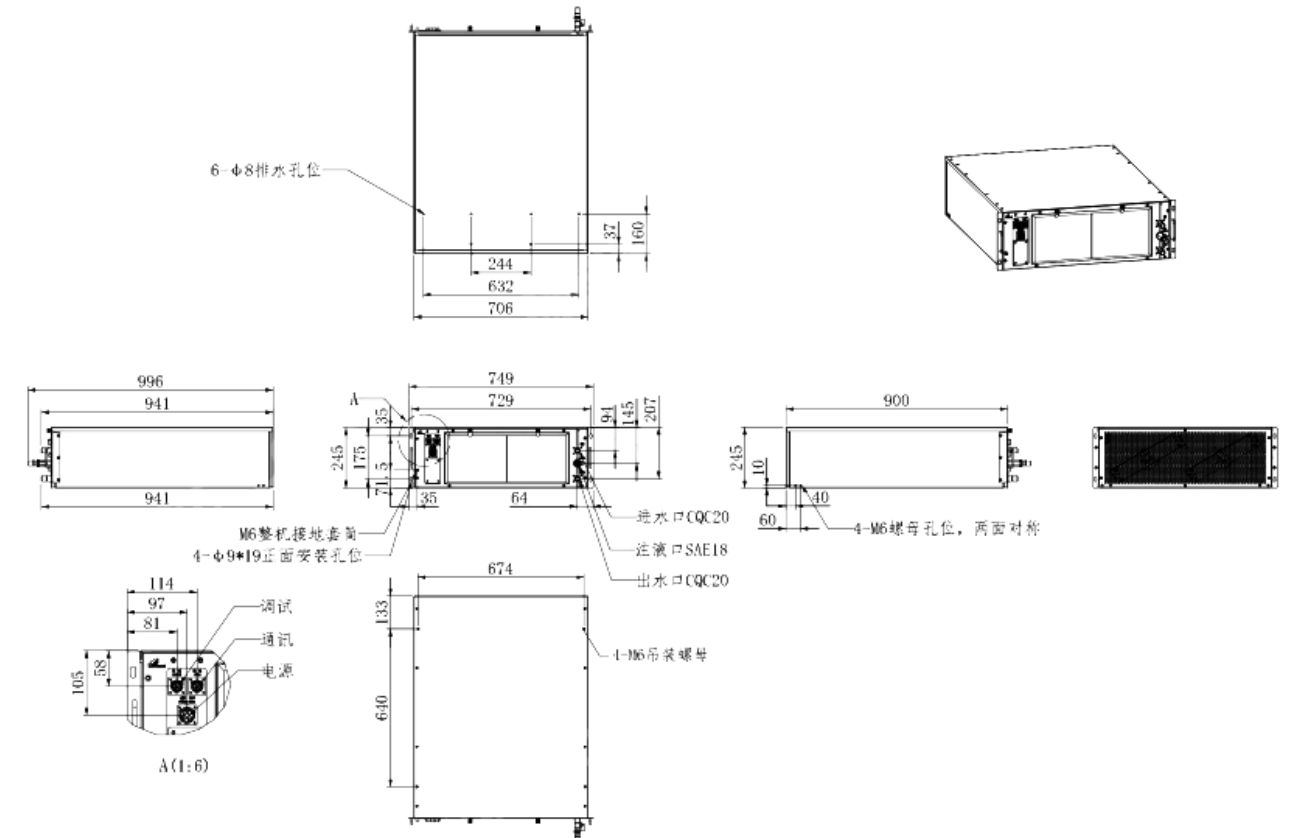
Capable of achieving both cooling and heating functions. Cooling function: It can effectively solve the problems of slow charging and discharging speed, reduced lifespan, and safety hazards caused by high temperature during battery charging and discharging.

Heating mode: It can effectively solve the problem of battery failure to start and performance degradation in low-temperature environments, ensuring that the battery operates efficiently within the appropriate temperature range.

3.6.2 Main Technical Parameters

Items	Unit	Parameters
Work Temp	℃	-30~+55
Storage Humidity Range	RH	5%~95%
Noise Grade	dB(A)	75@1m
Anti Corrosion Grade	/	C3M
IP Grade	/	IPX5
Cryogen	/	R134A
Cooling Medium	/	50% Ethylene Glycol Aqueous Solution
DC Side Parameters		
Cooling Capacity @ 45/W18	kW	5.0
Heating Capacity @ T=10Power Factor	kW	2.0
AC Side Parameters (Grid-Connected)		
Rated AC Input Power Supply	V/Hz	220~240V ,50/60Hz
Max Operating Current	A	19.2
Communication	/	RS485, CAN

3.6.2 Dimensions and Appearance



3.7 EMS

3.7.1 Function Introduction

EMS is a production process control automation system platform based on software and computer. It can quickly complete the construction of the entire monitoring system by configuring data, graphics, distributed control, communication, and report according to the monitoring objects and system needs, in order to monitor the operating equipment on site and achieve various functions such as data acquisition, display, alarm, equipment control, and parameter adjustment.

EMS is responsible for equipment status monitoring, energy management, statistical reporting, and other functions of the entire microgrid system. The EMS system consists of a microgrid controller and an EMS server.

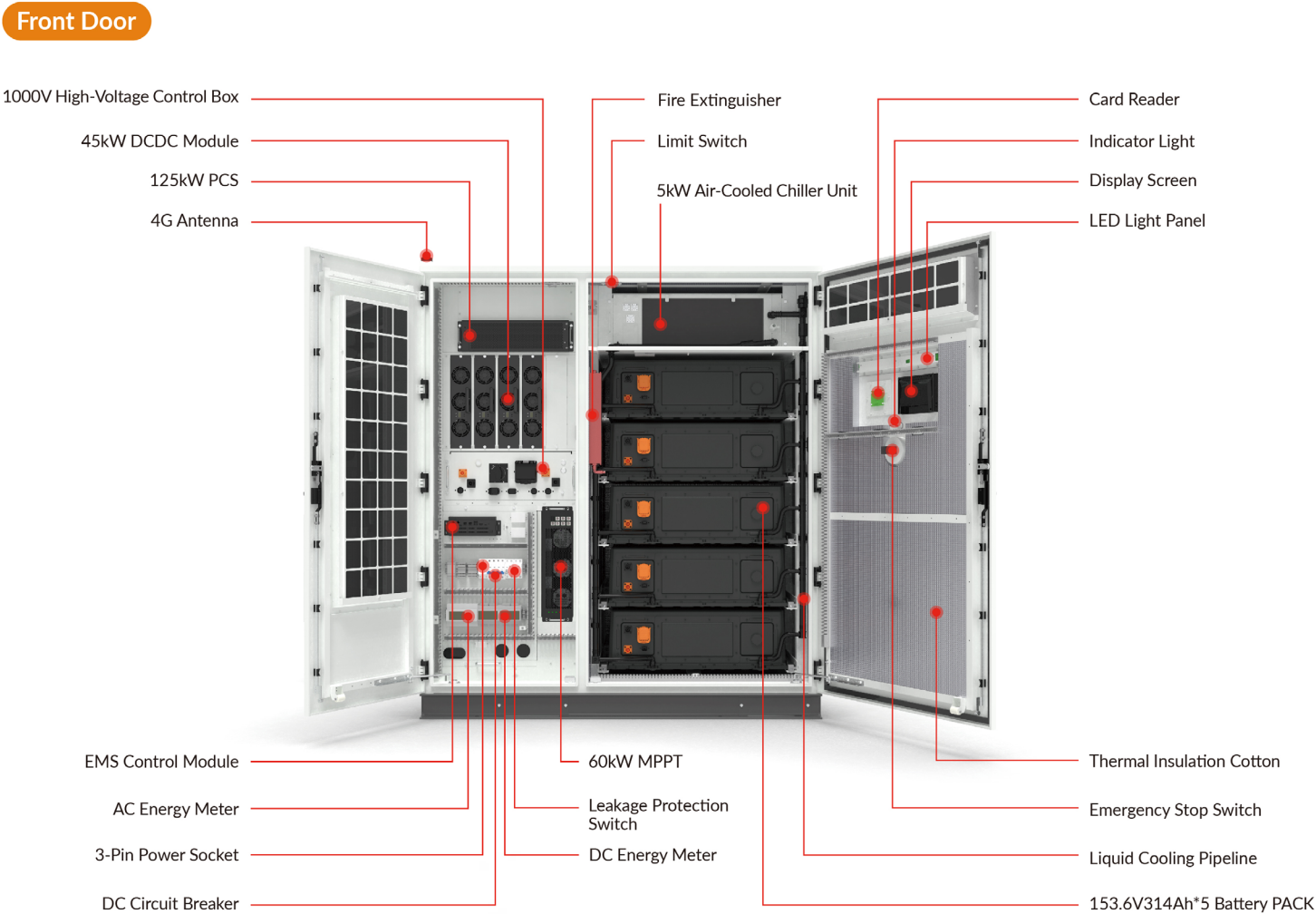
The microgrid controller communicates with the energy storage system, photovoltaic inverter system, and load power system equipment within the controlled microgrid range, obtains real-time status of each system equipment, uses energy management strategies to control the energy of each equipment, and issues device start stop instructions and power setting instructions.

The EMS server, as the upper computer system of the microgrid controller, monitors the status of the microgrid controller in real time, manages the status of various devices, performs parameter management, user management, and report statistics functions. It also communicates with higher-level upper computer systems or grid dispatch to respond to the scheduling of the higher-level energy management platform.

3.7.2 Technical Parameters

Project Description	Specifications	Remarks
Voltage/Current	≤ 0.2%	Depends on PCS/BMS
Power	≤ 0.5%	Depends on PCS/BMS
Remote Signaling Accuracy Rate	≥ 99.99%	/
Accident Alarm Accuracy Rate	100%	/
Remote Control and Remote Adjustment Accuracy Rate	100%	/
Remote Control Command Execution Time	≤3s	/
Remote Measurement Data Scanning Cycle	1~5s	User Adjustable
Real-time Data Synchronization Between Computers	≤ 2s	/
Accident Reversal Recording Time	5~60min	User Adjustable
Switching Time Between Hot and Standby Computers	≤ 10s	/
Accident Alarm Accuracy Rate	100%	/

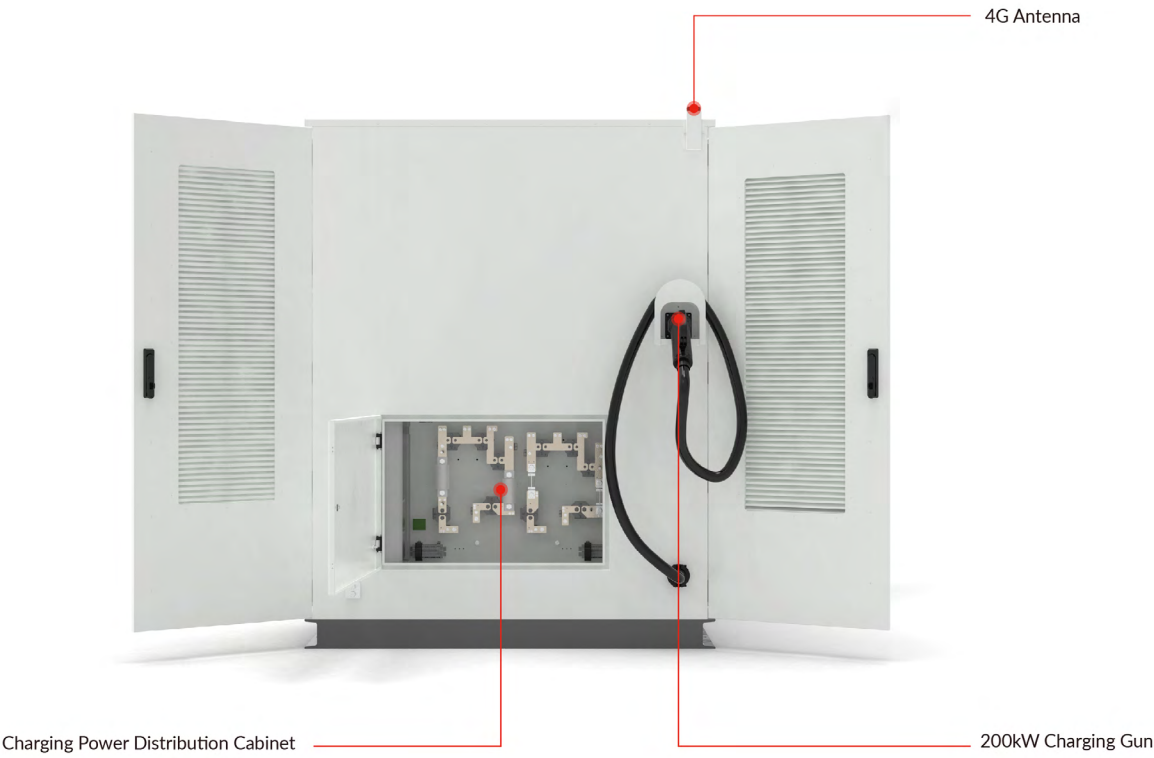
3.8 Configuration Diagram



Rear Door

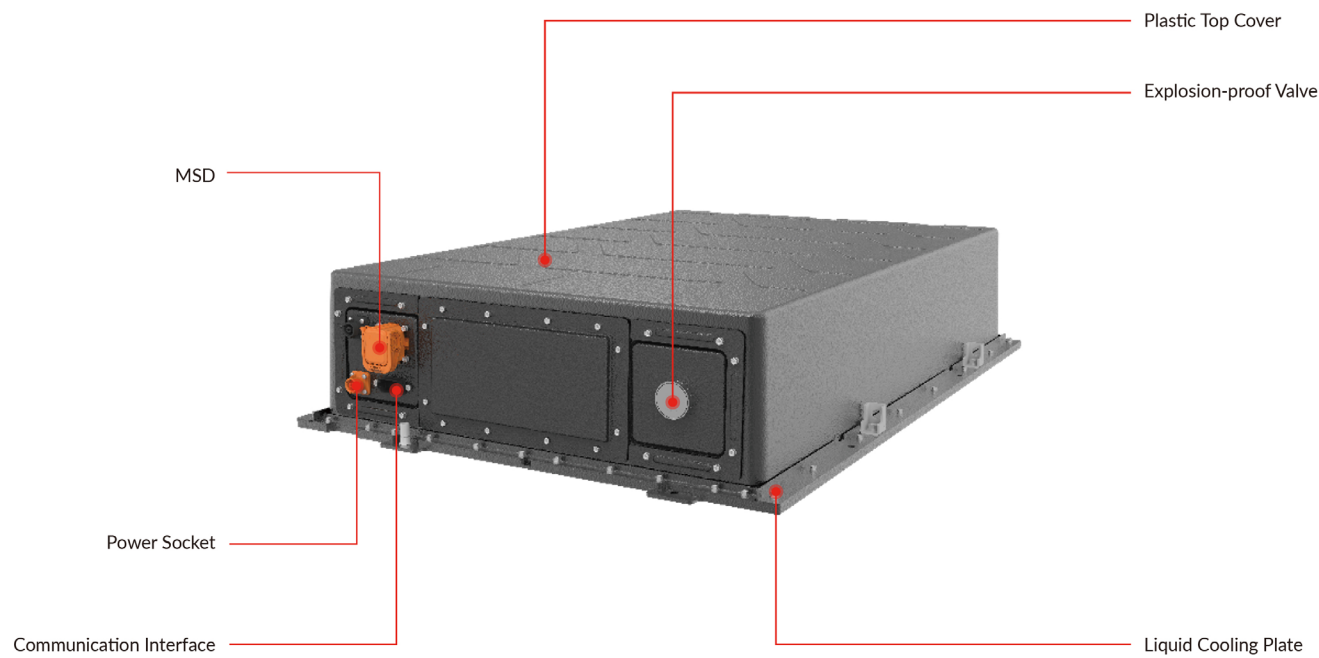


Left Door



4 - Main Supply List

Rack-mounted Chassis



No.	Equipment Name	Specifications	Unit	Quantity	Quantity
1	Energy Storage Cabinet	SPCC/SGCC	Set	1	Includes: Alarm, Running Indicator Light, Emergency Stop Switch
2	PCS	125kW	Set	1	On-grid and Off-grid Use
3	Pack	48.23kWh	Set	5	/
4	BMS	Passive Equilibrium	Set	1	/
5	EMS	/	Set	1	/
6	High Voltage Box	1000V	Set	1	/
7	Fire Protection System	Hot Aerosol	Set	1	/
8	Liquid Cooling Machine	5kW	Set	1	Including Cooling Pipe
9	DCDC Module	45kW	Set	4~5	45kW
10	Charging Gun	200kW	Pcs	2	Single Charging Gun is 200kW Max.
11	MPPT	60kW	Pcs	1	60kW Max.



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