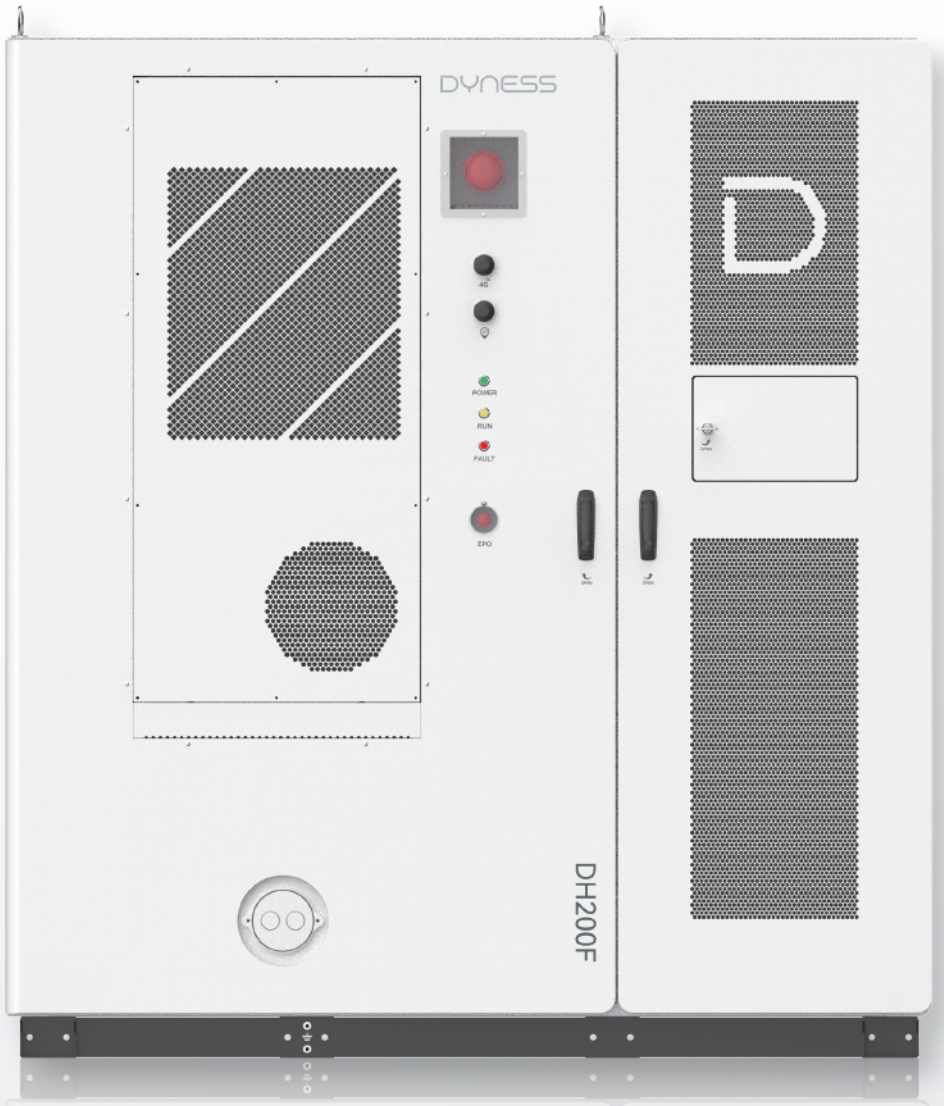
DYNESS



DH200F-C260

USER MANUAL

EnerCore
Outdoor PV+ESS All-in-one Cabinet

Version: 20260806-V1.1-EN, the version is subject to update without notice.

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Statement of Law

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It is prohibited to use part or all of the data in the firmware or software developed by the Company for commercial purposes in any way.
It is prohibited to decompile, decrypt, or otherwise damage the original program design of the software developed by the Company.
This product complies with the design requirements for environmental protection and personal safety. The storage, use, and disposal of the product shall be in accordance with the product manual, relevant contracts, or relevant laws and regulations.
When products or technologies are updated, customers can check the information on the website of Dyness.
Website: http://www.dyness.com/
Please note that products can be modified without prior notice.

Revised History

Revised Version	Revision Date	Revision Reason
1.0	2026.4.30	First publication
1.1	2026.7.30	Improvement and update of communication content
1.2	2026.8.6	Update installation layout requirements and add SOC calibration for system maintenance inspection

1. Guideline

CAUTION: Read this manual carefully before installing or operating this product. Keep this manual in a safe place for future reference.

1.1. Use of Manuals

- Manual content: This manual primarily introduces safety precautions, product features, delivery and storage, installation and use, wiring requirements, power-on/off process, HMI operation, maintenance, and quality assurance for this ESS product.
- Applicable population: This manual is suitable for professional technicians who install and maintain the ESS product, as well as users who carry out daily operations. Readers should have certain electrical knowledge.

1.2. Symbol and Abbreviation

This manual may contain the following symbols to emphasize important information, to ensure the safety of the user's personal and property when installing this product, or to facilitate efficient operation. Please read it carefully.

Table 1-1 Symbol Mark

	Indicate that there is high voltage inside the ESS cabinet, so beware of electrocution, which could result in personal safety issues.
	Indicate an electrical hazard; all external power connections must be disconnected before maintenance and operation.
	Indicate that there is a protective earthing (PE) terminal, which is used to prevent electric shock in the event of a fault, and needs to be firmly earthed to ensure operator safety.
	Recycle mark
	Hazardous waste needs professional recycling and can not be put in the trash can
	Instruction (User Manual) mark
	The cabinet may remain energized for up to five minutes after power disconnection; therefore, all operations should not commence until at least five minutes after the cabinet has been powered down.

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References to the following products in this manual are replaced by abbreviations for ease of presentation.

Table 1-2 Abbreviation Definition

Abbreviation	Full name
ESS	Energy Storage System
PCS	Power Conversion System
EMS	Energy Management System
BMS	Battery Management System
PACK	Battery Module
BDU	Battery Distribution Unit
SPD	Surge Protection Device
SOC	State of Charge
SOH	State of Health
DC	Direct Current
AC	Alternating Current
PV	Photovoltaic
MPPT	Maximum Power Point Tracking
RCD	Residual Current Device
CT	Current Transformer
PE	Protective Earthing

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2. Safety Instructions

2.1. Safety Principle

Related safety precautions need to be strictly followed during installation, operation, and maintenance. This product is a combined high-voltage DC and three-phase AC system and should only be operated by authorized personnel.

DANGER

- Deadly high voltages are present inside the product. Please observe and comply with the warning labels on the product.
- Do not touch the power grid or the contacts connected to it inside the product to prevent the risk of fatal electric shock!
- Damage to the battery may result in electrolyte leakage. If the electrolyte leaks, do not touch the leaking electrolyte or volatile gases and contact the after-sales service team immediately for assistance.

WARNING

- Transportation, installation, and maintenance must comply with local regulations and this user manual;
- Installation work must be assigned to a specialized full-time operator.

PROHIBITION

- Risk of damage to the battery system or personal injury or behavior is prohibited;
- Replacement of the modules by the user is prohibited, and the company will not be responsible for any damages caused.

2.2. Operator Qualifications

Only qualified electricians or professional personnel can operate the product. The operator should meet the following requirements.

- Shall be familiar with local standards and relevant electricity safety regulations;
- The operator shall have received professional training related to the installation and commissioning of electrical equipment, and should have the ability to respond to emergencies or unexpected situations that may occur during installation or trial operation.
- The operator shall have certain specialized knowledge of electronics, electrical wiring, and machinery and be familiar with electrical and mechanical schematic diagrams;
- The Operator should be fully familiar with equipment protection and standard maintenance, and operations should comply with established safety standards.

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2.3. Environmental Safety Requirements

- Do not install and use the product in environments with temperatures below -20℃ or above 50℃;
- Do not install and use the product near any heat sources or combustible materials;
- Do not install and use the product in areas with frequent movement of personnel;
- Do not expose the product to corrosive gases or liquids;
- Keep the product installation and use away from children and animals;
- The maximum installation altitude for the product should not exceed 3000 m, and it should be derated when above 2000 m;
- Sufficient space should be reserved for product installation to ensure adequate ventilation;
- Isolation barriers must be set up during installation to prevent any unrelated personnel from entering the site.

2.4. Electrical Safety Requirements

The operator must ensure that all basic information and step-by-step instructions are understood before commissioning and switching off the disconnecting circuit-breaker.

DANGER

Battery Protection Safety

Please ensure that during installation and maintenance of the equipment:

- The battery is completely disconnected.
- Have a visible warning sign at the break point to ensure no accidental reconnections.

Ground Fault Protective Safety

- When a ground fault occurs, the original non-electrified part may carry high voltage, and accidental electric shock can lead to personal safety! Ensure that there is no ground fault and take necessary protective measures before operation.

Safety Of Live Line Measurements

- Given the presence of high voltages in this equipment, protective measures (e.g., wear insulated gloves, etc.) must be taken during live line measurements, and the operator must be accompanied by a person to ensure personal safety.

Arc Protection Safety

- Avoid arc, fire, and explosion hazards caused by improper operation;
- Prohibit touching uninsulated cables that may be energized;
- When a loose connection occurs in the power cable, or a screw or other component falls out accidentally, do not operate it without authorization,

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and it must be handled by a qualified professional to avoid causing a larger malfunction.

2.5. Transportation and Installation Safety Requirements

WARNING

Personnel Operation Regulations

- Forklifts, cranes, and other construction machinery must be operated by qualified operators if required on site.
- The operator must wear insulated protective equipment that complies with safety regulations during installation;
- When connecting the power on-site, a professional guardian must be assigned to protect the switches that need to be turned off;
- Ensure that it has no electrical connections before installation;
- Each completed project must be checked at least once and cross-checked during the installation process;
- The equipment must be installed in sequence without skipping any steps.

Wiring regulations

- Appropriate measuring devices must be used, appropriate standards and directives must be followed;
- The operating manual of the measuring device must be known before any measurement is carried out.
- Only use equipment specified by Dyness. Failure to use equipment specified by Dyness may result in impaired protection as well as injury to personnel.

Test run after installation

- Only after confirmation by professionals and obtaining permission from local electrical authorities can the equipment be put into operation;
- Before operation, please switch off all distribution circuit breakers, and it is strictly prohibited to disconnect them during product running.

DANGER

- Do not change fuse size or rating value during installation;
- It is not allowed for two or more operators to connect a single wire simultaneously during the wiring process.

2.6. Daily Operation and Maintenance

All operations of the product should follow the instructions in the User Manual. Damage to the equipment caused by violation of these instructions will void the associated liability and warranty. If necessary, contact Dyness Customer

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Service for repairs.

WARNING

- The software, shell, and components of the product may not be changed without Dyness authorization. If changed, the corresponding liability and warranty shall be void;
- Do not remove or alter the nameplate;
- Do not open the cabinet doors in inclement weather such as rain or strong winds.

Battery maintenance

- Battery maintenance must be performed by personnel who are familiar with battery systems and the required safety precautions, or under the direct supervision of such qualified individuals.
- When replacing batteries, the same type and quantity of batteries or battery packs must be used.
- General Instructions for Battery Disassembly and Installation.

a) Do not open or damage the battery. The released electrolyte is hazardous to skin and eyes and may be toxic upon exposure.

b) Batteries present risks of electric shock and high short-circuit currents.

- Precautions for Handling Batteries:

a) Remove all metallic objects, such as watches, rings, or other jewelry, before beginning work.

b) Use only tools equipped with insulated handles.

c) Wear appropriate personal protective equipment, including rubber gloves and insulating boots.

d) Never place tools or metal components on or across the battery terminals.

e) Always disconnect the power supply prior to connecting or disconnecting battery terminals.

f) Verify whether the battery is accidentally grounded. If grounding is detected, immediately disconnect the battery from the circuit.

2.7. Product Obsolescence

When the product as a whole or individual internal components become aged or damaged and need to be discarded, they cannot be disposed of as regular waste. Some components inside the product can be recycled and reused. Improper disposal of certain components may cause environmental pollution. Please contact a qualified local professional recycling organization for proper disposal of the product and internal components.

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3. Product Description

3.1. Product Overview

This product is an integrated industrial and commercial optical storage air-cooled cabinet with a system storage capacity of 261kWh and a rated AC output power of 125kW. The system integrates PACK battery packs, PCS energy storage converters, EMS energy management systems, BDU intelligent control units (built-in BMS battery management system), optional MPPT, STS, fire protection systems, air conditioning systems, and other components. It supports DC photovoltaic access and off-grid switching functions and can provide users with functional services such as peak-valley arbitrage, peak shaving, and valley filling, as well as dynamic capacity expansion and demand response. It is widely applicable to small and medium-sized industrial and commercial scenarios, including charging stations, commercial buildings, and manufacturing industries

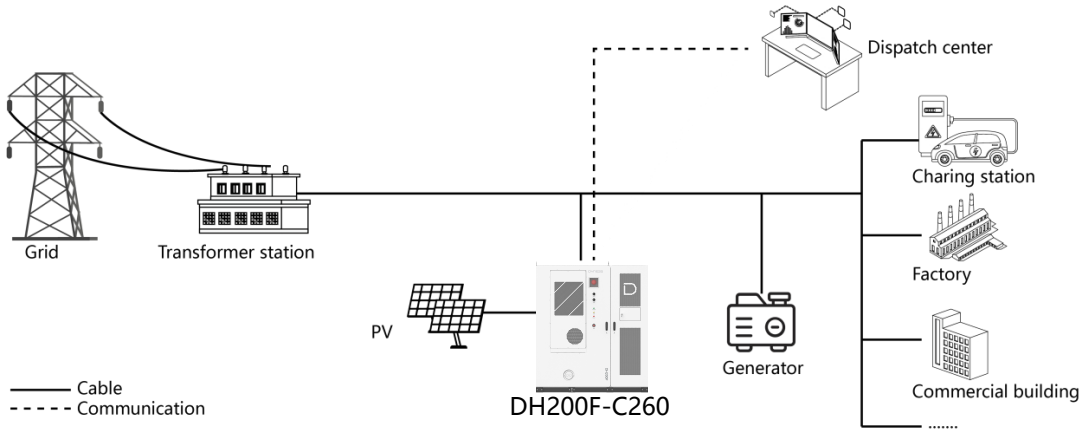


Figure 3-1 System Application

The product features are as follows:

1) Basic functions: On-grid operation, On-grid/off-grid switching, off-grid operation
2) Optional functions: photovoltaic DC-side connection;
3) Extended functions: Grid-connected access for photovoltaic systems and diesel generators (Diesel generators cannot be directly connected to the battery system.) The system can control the start and stop of diesel generators to supply power to the load side. If access to a diesel generator is required, please contact the manufacturer in advance.).
4) System AC Expansion: It supports parallel capacity expansion of multiple units. Up to 10 units can be connected in parallel for grid-tied operation, with the total capacity expandable to a maximum of 2.61MWh; up to 4 units can be connected in parallel for grid-connected and off-grid operation, and the maximum expandable total power/capacity of the system reaches 0.5MW/1.0MWh.

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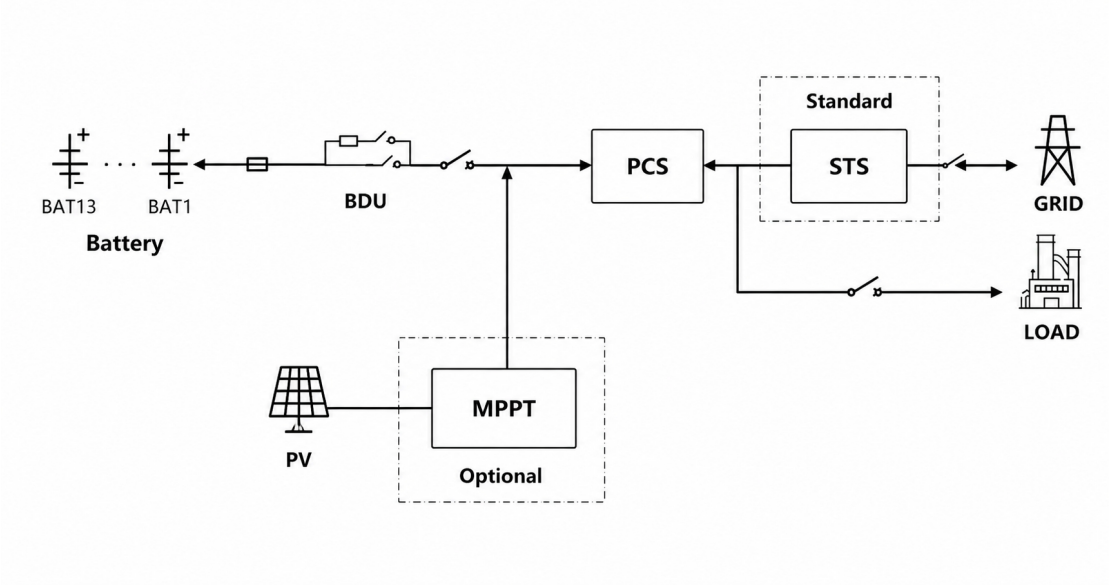


Figure 3-2 System Topology

3.2. Product Model

This manual applies to outdoor air-cooling ESS products (DH200F-C260) of the EnerCore series. The definitions are explained as below:

DH: Dyness high voltage series products

200: Product Model Series

F: Fan/air-cooling system

C: Capacity, specify the specific battery capacity after C

P: Power, where P denotes the rated power of the product

S: Photovoltaic, the number after S indicates the number of MPPT channels

Table 3-1 Product Model

No.	Model	Description
1	DH200F-C260P124-S0	All-in-one cabinet, no PV, On&off-grid Grid-connected output power 124.9 kW
2	DH200F-C260P124-S4	All-in-one cabinet, 4-channel PV, On&off-grid Grid-connected output power 124.9 kW
3	DH200F-C260P125-S0	All-in-one cabinet, no PV, On&off-grid Grid-connected output power 125 kW
4	DH200F-C260P125-S4	All-in-one cabinet, 4-channel PV, On&off-grid Grid-connected output power 125 kW

3.3. Product Configuration

This product adopts a modular design, which is easy to install, operate, and maintain. The product configuration list is as follows:

Table 3-2 Product Configuration List

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Module	Function	Qty.	Config.
PACK	Used for energy storage, providing stable and continuous power output to the system.	13	Standard
PCS	Enables bidirectional conversion between direct current and alternating current.	1	Standard
EMS	System energy management and comprehensive control.	1	Standard
BDU	Battery control unit and high-voltage power supply.	1	Standard
MPPT	Dynamically adjusts photovoltaic input power to improve the power generation efficiency of the photovoltaic storage system.	4	Optional
STS	Enables switching between grid-connected and off-grid modes.	1	Standard
Security & Fire protection systems	Provides intrusion protection, emergency response, fire prevention, and effective fire extinguishing for equipment.	1	Standard
Air conditioner system	Regulates battery operating temperature to ensure that batteries operate at the most suitable temperature.	1	Standard

3.4. System Parameters

The parameter may vary without notice during product upgrade:

Table 3-3 DH200F-C260 Parameters

Model	DH200F-C260
Battery	
Battery Type	LFP ($LiFePO_4$)$_4$)
Battery Capacity	314Ah
PACK Configuration	1P20S*13
Rated Current	157A
Max. Current	180A
Voltage Range	754~936Vdc
Nominal Capacity	261kWh
On-grid AC Side	
Rated Input/Output Power	250kW/125kW
Maximum Input Current / Output Current	361A/200A
AC Rated Voltage	400Vac
Wiring Method	3P4L+PE
Frequency	50 Hz/60 Hz
Power Factor	≥0.99 (1 (leading) ~ 1 (lagging))
THDi	≤2% (Rated power)
Max. Number of Parallel Expansions	10

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Off-grid AC side (Optional)	
Rated Power	125 kVA
AC Rated Voltage	400Vac
AC Maximum Current	200A
Wiring method	3P4L+PE
Frequency	50 Hz/60 Hz
Unbalanced Load	100%
THDv	<3% (Liner load)
Max. Number of Parallel Expansions	4 (Requires matching with SCC-AC)
Photovoltaic (Optional)	
Max. Input Power	63kW*4
Max. Input Current	160A*4
Short-circuit Current	240A*4
Maximum Input Voltage	720Vdc
Input Voltage Range	200-720Vdc
Startup Voltage	250Vdc
MPPT Path	4
System	
Weight	2900±100kg
Dimension (W * D * H)	2000*1346*2200mm
Max. Efficiency	88%
Air Conditioner Power	5 kW (Cooling), 3 kW (Heating)
Operating Temperature	-20~50℃ (Derating above 45℃)
Operating Humidity	0～95% RH (Non-condensing)
Ingress Protection	IP55
Anti-corrosion Grade	C3
Cooling Method	Air-cooling
Noise	≤75 dB (Optional add-on ≤65 dB)
Elevation	3000 m (Derating above 2000 m)
Display	Touch screen
Fire protection	Aerosol, Water fire system, Multi-sensor/Water ingress, Audible&Visual alarm, Explosion-proof ventilation
Communication	Ethernet/4G/RS485/CAN
Certification	CE, LVD, UN38.3, UL9540A

* Note: The rated input power on the grid-connected AC side is 250 kW, of which 125 kW is supplied to the load side, and another 125 kW is used for charging the energy storage system.

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3.5. Appearance Design

Dimension: 2000*1346*2200mm (Fixed basement and hanging rings not included)

Net weight: Approx. 2900 kg (Full configuration)

Product IP grade: IP55

Anti-corrosion level: C3

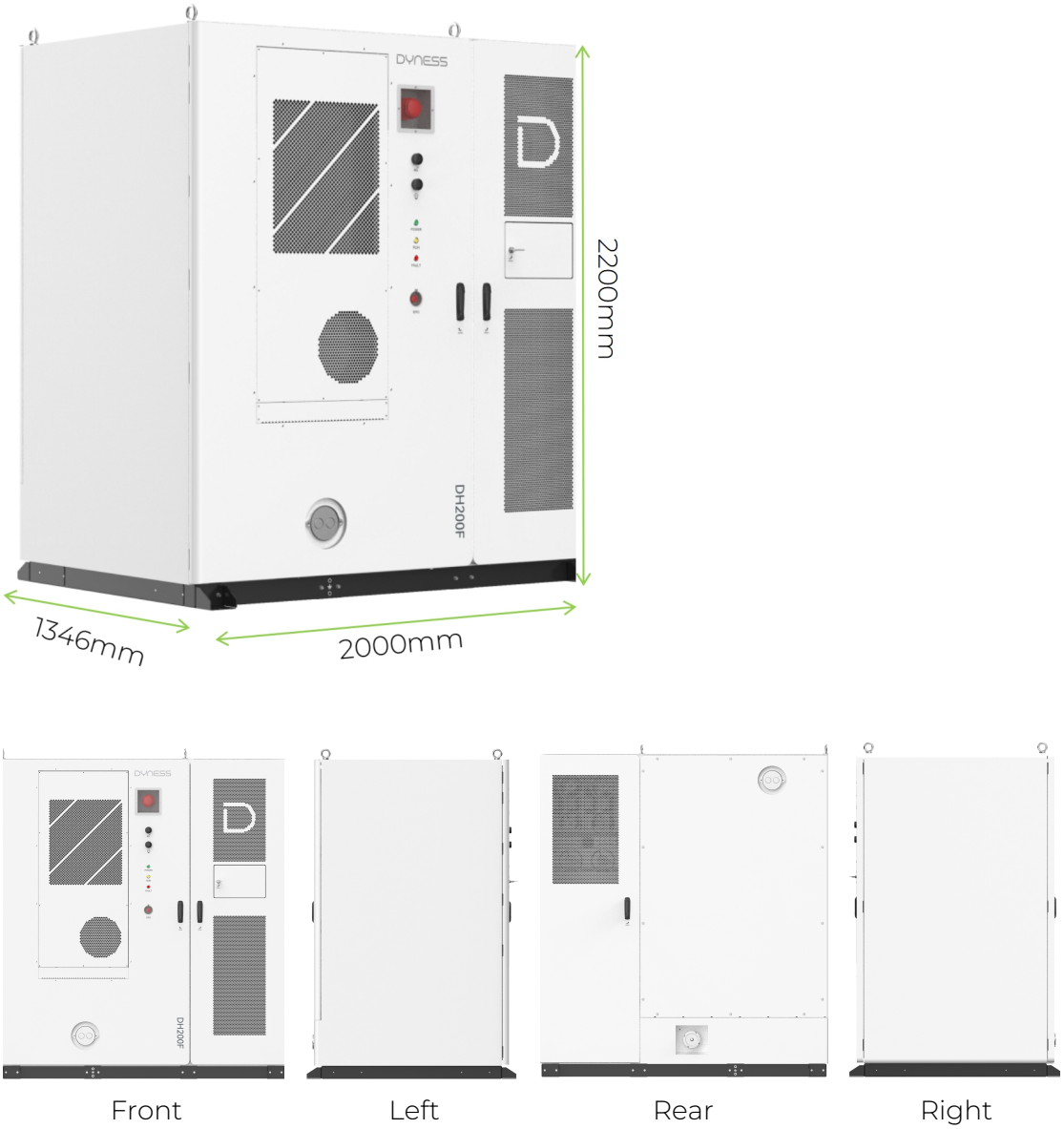


Figure 3-3 Product Appearance

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The front of the product is equipped with an audible and visual alarm, an air inlet, an HMI screen, an emergency stop button, an operation indicator light, a 4G antenna, an air conditioner, and an explosion-proof air inlet. The back of the product is provided with an explosion-proof exhaust outlet, air outlet, rear wiring port, and a water fire protection system.

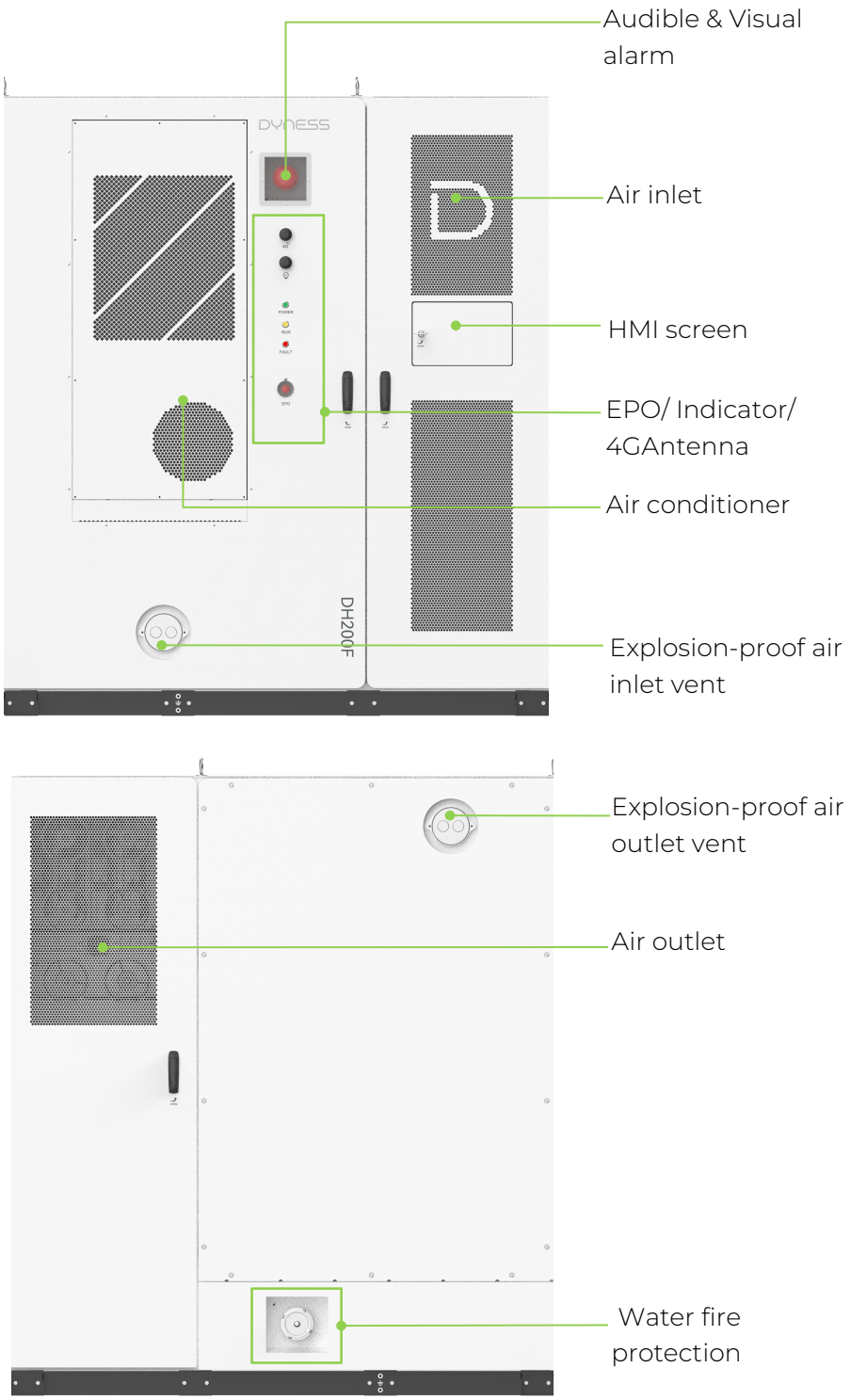


Figure 3-4 Appearance Function Diagram

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Table 3-4 Definition of Appearance Functions

No.	Appearance	Name	Functions
1		Audible & Visual Alarm	Audible and visual alarms provide timely warnings of emergencies.
2	/	Air inlet/outlet	Introduce external cool air and expel hot air for heat dissipation and temperature balancing.
3	/	HMI screen	User-system interaction interface.
4		EPO	Pressing the button stops the system from running.
5		Power Indicator	A steady on indicates power is connected.
6		Operation indicator	A steady light indicates normal system operation, and a turned-off light indicates standby mode.
7		Fault Indicator	A steady on indicates a system fault.
8		4G antenna	Receive and transmit 4G signals.
9		Bluetooth antenna	Receive Bluetooth signals.
10	/	Air conditioner	Regulate battery temperature to ensure safe operation, optimize efficiency, and extend the lifespan
11	/	Explosion-proof air inlet/outlet vent	Introduce fresh air and exhaust flammable gases
12	/	Rear outlet	System rear output interface, suitable for grid, load, and photovoltaic connections
13	/	Water fire protection	Connect to water-based fire suppression systems to control fire spread

** CAUTION: Do not operate the emergency stop button in a non-emergency situation.*

Under the DC capacity-expansion networking condition of DH200F-C260 and BF200-C260: When the DC-side of DH200F-C260 fails while its AC-side operates normally, both the run indicator and fault indicator of the unit will light up. The charging and-discharging functions of the AC-side and the expanded BF200-C260 work normally. The system backup duration is affected by the number of faulty modules, while the output power remains unaffected.

When BF200-C260 malfunctions, the fault indicator light on the local cabinet turns on. Both the running indicator light and the fault indicator light of DH200F-C260 light up simultaneously, while the charge and discharge

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functions of DH200F-C260 can be performed normally. The system backup power duration is restricted by the number of faulty modules, and the output power remains unaffected.

3.6. Internal Design

The product consists of two parts: the battery compartment and the electrical compartment.

Battery compartment: PACK, BDU, air conditioner, fire protection system;

Electrical compartment: PCS, MPPT (optional), STS, secondary auxiliary power switch, photovoltaic isolating switch, power grid and load switch.

With the following internal design:



Figure 3-5 Internal Functional Diagram



Figure 3-6 Schematic Diagram of Internal Backdoor Functions

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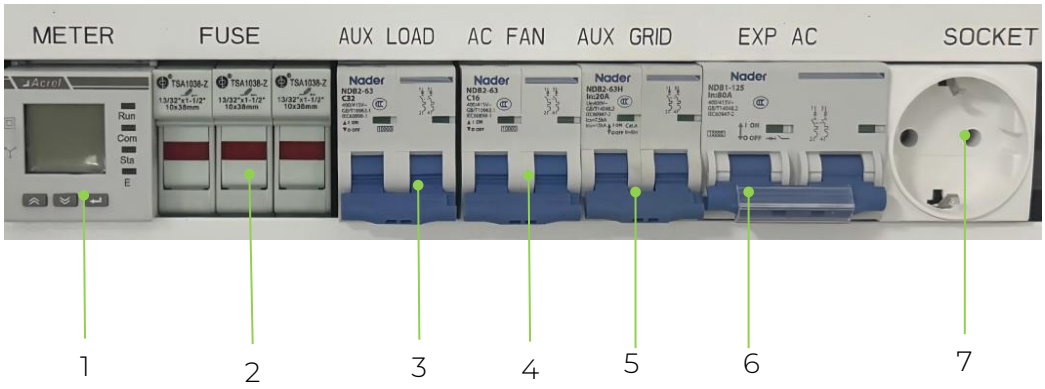


Figure 3-7 Schematic Diagram of Secondary Switches in the Front Electrical Compartment

Table 3-5 Functional Definition of Secondary Switches in the Front Electrical Compartment

No.	Name	Functionality
1	METER	Three-phase AC electricity meter
2	FUSE	AC fuse, used for short-circuit protection of voltage sampling on the grid side
3	AUX LOAD	Miniature Circuit Breaker, used for switching on/off and protecting the main circuit of AC auxiliary power supply on the load side
4	AC FAN	Miniature circuit breaker, used for switching on/off and protecting the power supply circuit of the electrical compartment fan
5	AUX GRID	Miniature Circuit Breaker, used for switching and protection of AC auxiliary power supply circuits on the grid side
6	EXP AC	Miniature circuit breaker, used for switching and protection of auxiliary power supply and socket power supply circuits in DC capacity expansion cabinets
7	SOCKET	European standard socket

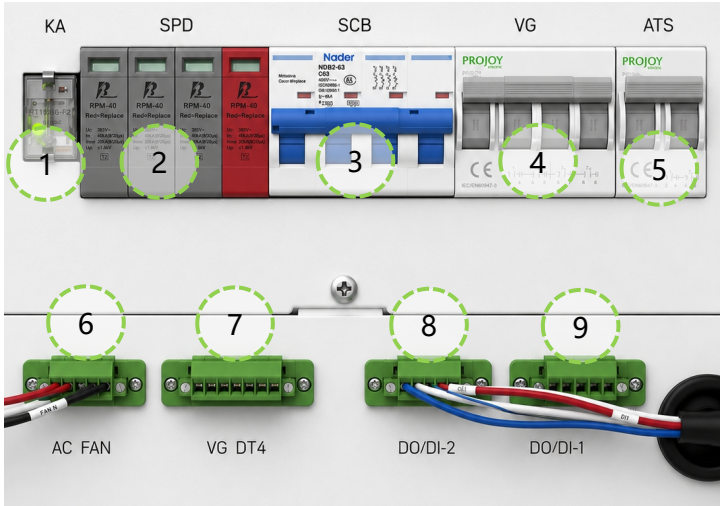


Figure 3-8 Schematic Diagram of Secondary Switches in the Rear Electrical Compartment

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Table 3-5 Functional Definition of Secondary Switches in the Rear Electrical Compartment

No.	Name	Functionality
1	KA	Intermediate relay, controlling the start and stop of the fan
2	SPD	Surge protector for surge protection on the AC side
3	SCB	Miniature circuit breaker, used as back-up protection for surge protectors
4	VG	Power grid voltage sampling transfer switch, used with SCC-AC switching cabinet
5	ATS	Auxiliary power transfer switch, for use with SCC-AC switching cabinet
6	AC FAN	Adapter for cooling fan
7	VG DT4	Grid voltage sampling terminal of grid-tied and off-grid switching cabinet (SCC-AC)
8	DO/DI-2	Wiring terminals for STS control lines, for use with SCC-AC switching cabinets
9	DO/DI-1	Wiring terminals for the control lines of the STS module

3.7. Main Modules

3.7.1. PACK

DANGER

- Do not touch any batteries while the BESS is running;
- Only authorized operators should handle the batteries.
- End of life (should be decommissioned, disassembled, and disposed of in accordance with the recycling program provided).

This system's PACK uses lithium iron phosphate batteries, with 314Ah cells. The stringing method is 1P20S, and the nominal capacity of the PACK is 20.0kWh, with a nominal voltage of 64V. Each battery PACK is equipped with 1 level 1 BIC module (slave control) for collecting the voltage and temperature parameters of the PACK, and it also has functions such as power balance and thermal management. The PACK module adopts air cooling for heat dissipation, with an IP20 protection level. It has a high structural reliability and low maintenance cost.



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Figure 3-9 PACK Diagram

Table 3-7 PACK Configuration

Model	**HV64314F**
Parameter	Value / Specification
Cell Configuration	1P20S
Energy (kWh)	20.096
Nominal Voltage (Vdc)	64
Nominal Capacity (Ah)	314
Standard Charge/Discharge Current (A)	157
Dimensions (mm) (W*D*H)	565*887*228
IP Rating	IP20
Operating Humidity (RH)	0% to 95%
Storage Temperature (℃)	1 Month: -20 to +45 1 Year: 0 to +35

WARNING

- When battery leakage occurs, or there is an abnormal smell from the battery, if it is difficult to determine whether the electrolyte leaks, please stop using it immediately and contact Dyness or professionals;
- Please do not touch the electrolyte directly. If skin contact is accidental, please flush with plenty of water;
- When handling leaking batteries, make sure that the power supply connected to the battery is off to prevent fire and sparks, and keep the environment well ventilated;
- Wear rubber gloves (insulation voltage > 10 kV) when handling leaking batteries;
- Please use gauze (ordinary medical gauze) or other liquid absorbent solids to clean the battery leakage;
- The treated battery should be placed in isolation and should not be used again;
- The above operations shall be completed by personnel designated by Dyness or qualified professionals.

3.7.2. PCS

PCS is a bidirectional current control conversion device that connects energy storage battery systems to the power grid. Its primary functions include facilitating energy exchange between batteries and the grid, controlling and managing battery charging and discharging, and enabling bidirectional conversion between DC and AC. It can convert AC to DC to charge batteries and convert battery DC to AC to feed back into the grid.

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The PCS in this system has an IP20 protection rating and a rated output power of 125 kW.



Figure 3-10 PCS Diagram

Notice: Please replace the dust cover regularly. If the dust cover is blocked, the temperature will rise abnormally.

3.7.3. EMS

The EMS energy management system is an important part of the energy storage system. It communicates with PCS, BMS, MPPT (optional), STS , meters, fire protection systems, air conditioners, and other equipment to control the entire ESS, enabling functions such as peak-valley arbitrage, peak-shaving, self-consumption, battery priority, backflow prevention, and transformer protection. EMS collects data and signals from local devices and employs internal control strategies to ensure the safe, reliable, efficient, and economical operation of the energy storage system.



Figure 3-11 EMS Diagram

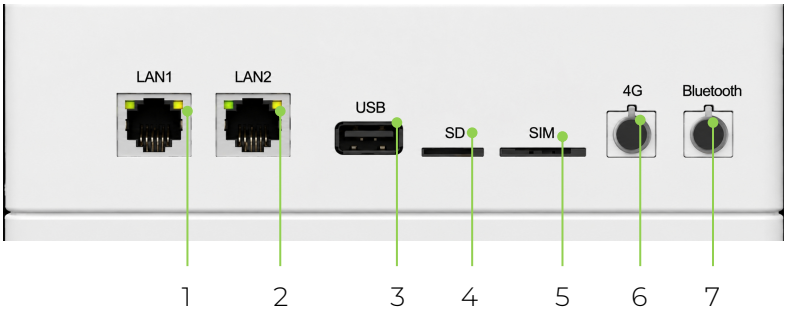


Figure 3-12 EMS Port Diagram

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Table 3-8 EMS Port Function Definition

No.	Label	Definition
1	LAN1	DHCP MODBUS_TCP Communication Port
2	LAN2	Ethernet Dyness cloud platform port
3	USB	USB port, EMS local program upgrade
4	SD	SD card port, used for local data storage
5	SIM	SIM card port
6	4G	4G antenna port
7	Bluetooth	Bluetooth antenna port

*Note: **Modbus-TCP** The **LAN1** interface of the device's EMS energy management system serves as the DHCP Modbus-TCP communication port, which can be used for communication with third-party EMS via this protocol.*

3.7.4. BDU

The BDU is equipped with a built-in BMS (Battery Management System), high-voltage contactors, high-voltage fuses, circuit breakers, and other control and protection devices, integrating control, protection, and monitoring functions into a single unit. This reduces the need for external cables and independent components, enhancing system compactness. Through efficient power distribution, multiple layers of protection, and intelligent management, the system ensures stable operation while providing data support and operational convenience for maintenance and operations.



Figure 3-13 BDU Diagram

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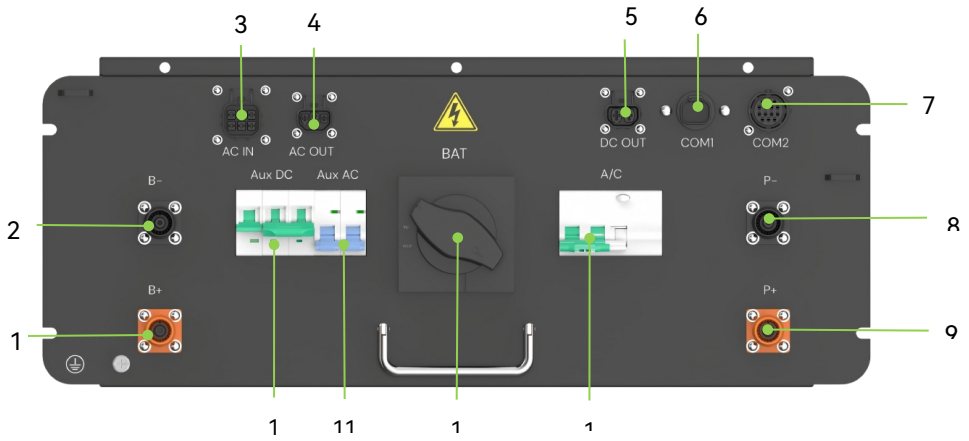


Figure 3-14 BDU Port Diagram

Table 3-9 BDU Port Definition

No.	Identifier	Function Description
1	B+	Battery Cluster Positive Input
2	B-	Battery Cluster Negative Input
3	AC IN	Air Conditioning & AC/DC Auxiliary Power Input
4	AC OUT	BDU AC Power Output
5	DC OUT	Fan Power Supply Output
6	COM1	Internal Communication
7	COM2	BCU Communication / Secondary Power Output
8	P-	Battery Cluster Negative Output
9	P+	Battery Cluster Positive Output
10	Aux DC	DC-side Auxiliary Power Supply Switch
11	Aux AC	AC-side Auxiliary Power Supply Switch
12	BAT	Main Switch on the Battery Side
13	A/C	Air Conditioning Switch

3.7.5. MPPT

Supports access to solar panels in MPPT mode to realize maximum power point tracking and improve the utilization rate of the photovoltaic system. This module is equipped with multiple protection functions, including overcurrent protection, over-temperature protection, low-side overvoltage and undervoltage protection, high-side overvoltage and undervoltage protection, overpower protection, low-side short-circuit protection, and reverse connection protection. In boost mode, the DC input voltage on the photovoltaic side must be lower than the minimum voltage of the battery system. That is, the high-

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voltage side of the MPPT module is connected to the battery system, and the low-voltage side is connected to the solar panels.

The MPPT of this system is an optional module with a rated output power of 63 kW. Up to 4 modules can be configured in the system, supporting the connection of 252 kW DC photovoltaic power.



Figure 3-15 MPPT Diagram

3.7.6. STS

This module is a hybrid solid-state grid-tied/off-grid seamless transfer switch, integrating low-voltage electrical fast electromagnetic drive technology, semiconductor solid-state arc extinguishing technology, and other related technologies. The product features fast opening speed, stable opening time with low dispersion, and high operational reliability, and is mainly applied to photovoltaic energy storage systems. The grid-tied/off-grid transfer function is a standard module of this system.

This grid-tied/off-grid transfer switch is also equipped with a bypass function. For the red button (closing): press and hold it for 15 seconds, then release to trigger the closing operation; the remote control will be enabled (i.e., the bypass function is activated) after successful closing. For the green button (opening): a short press triggers the opening operation and disables remote control; when in the open state, press and hold the button for 3 seconds to enable remote control.

[The red indicator light is on during closing, the green indicator light is on during opening, and the yellow indicator light serves as an alarm light]



Figure 3-16 STS Diagram

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3.7.7. Fire Protection System

This system is equipped with an efficient and reliable security system and fire protection system capable of providing intrusion protection, emergency response, fire prevention, and effective fire extinguishing for the equipment.

Fire Protection System

- Limit switch: Limit switches are installed in the battery compartment and electrical compartment to prevent the door from being opened accidentally during normal operation. They can detect whether the door is closed tightly to prevent rainwater from entering.
- Water detector: A water detector is installed at the bottom of the electrical compartment. When water is detected in the cabinet, the EMS will report a water immersion fault, and the system will shut down.

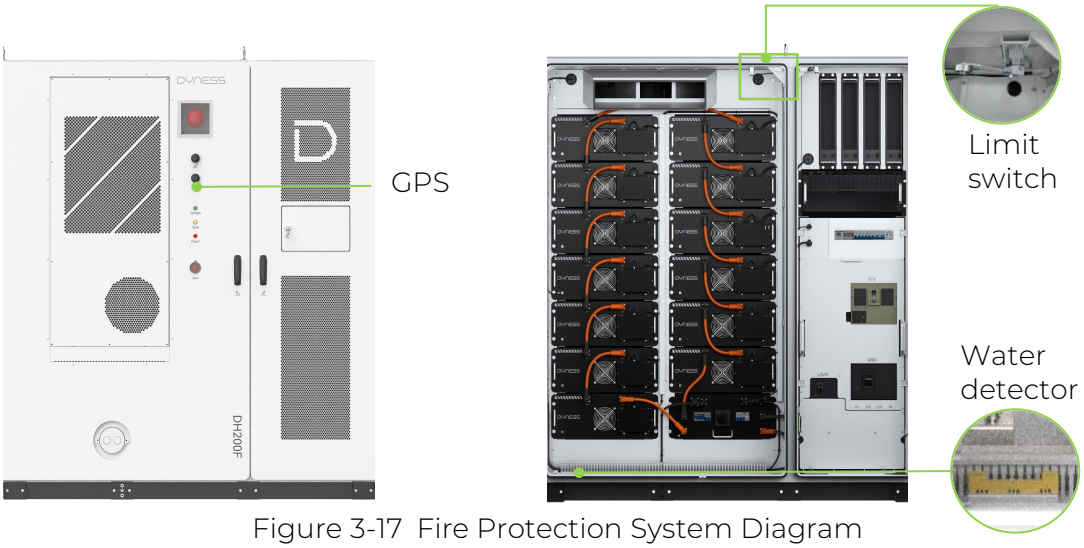


Figure 3-17 Fire Protection System Diagram
(Internal drawings are for reference only, subject to the actual delivered products.)

Fire Protection System

- Audible and visual alarm: When a fire alarm is triggered, the audible and visual alarm will emit a high-decibel sound and a high-frequency flashing red light.
- Explosion-proof ventilation system: Linked with the fire detection system, when the CO gas concentration in the battery compartment reaches the set threshold, the explosion-proof intake and exhaust valves and explosion-proof exhaust fan will be activated. When the concentration is below the threshold, the explosion-proof intake and exhaust valves and explosion-proof exhaust fan will be deactivated.
- Composite detector: This system installs a composite detector on the top of the battery compartment, which simultaneously detects smoke, temperature, CO gas, VOC, and other parameters and transmits real-time data to the EMS.
- Aerosol: The aerosol system has two activation methods: temperature-activated and electrically activated. The temperature-activated method

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triggers the aerosol spray when the temperature inside the battery compartment rapidly rises to approximately 185℃ or open flames are detected, causing the thermosensitive wire to ignite. The electrically activated method triggers the aerosol system when the composite detector in the protected area detects a fire, causing the EMS to immediately send an electrical activation signal to the aerosol system and provide a 24V power supply for electrical activation.

- Water fire suppression: When the fire spreads, large-area water spraying is used to cool down the area, preventing thermal runaway from spreading to the entire battery compartment. (If there is still a fire in the battery compartment after the aerosol fire suppression system has been discharged, the water sprinkler system can be manually activated to continuously cool down the out-of-control battery compartment.)



Figure 3-18 Fire Protection System Diagram
(Internal drawings are for reference only, subject to the actual delivered

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products.)

The maintenance of the fire protection system should comply with the fire codes and regulations of the country/region where the project is located.

Fire protection equipment should be inspected and maintained regularly to ensure that all functional indicators are normal.

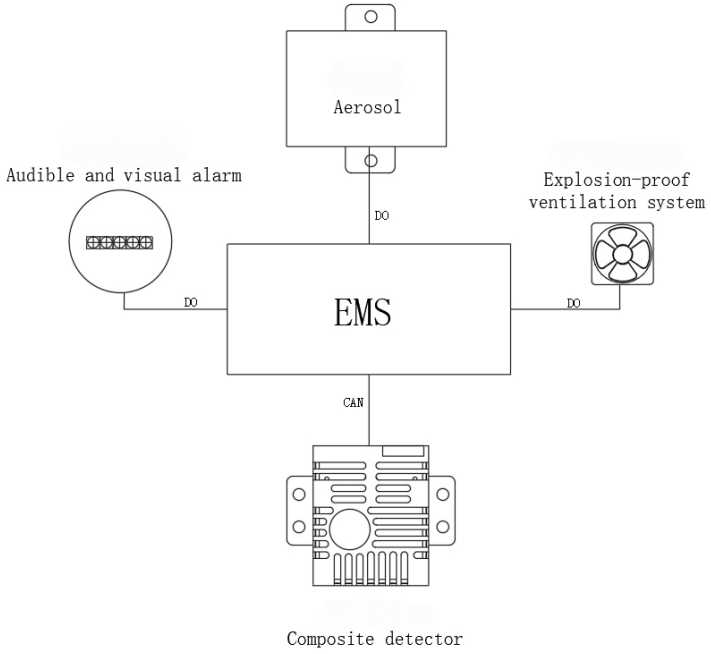


Figure 3-19 Fire Protection Schematic Diagram

3.7.8. Air Conditioner

This system is an air-cooled system equipped with one industrial air conditioner with a cooling capacity of 5 kW and a heating capacity of 3 kW.

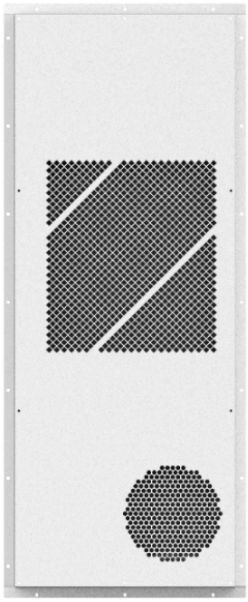


Figure 3-20 Air Conditioner Diagram

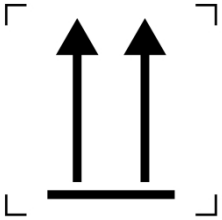
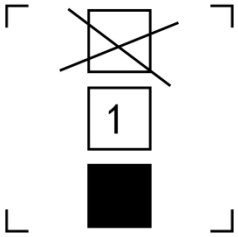
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4. Delivery and Transportation Storage

Caution: Failure to transport and store in accordance with the requirements of this manual may void the warranty.

4.1. Packaging Marks

Table 4-1 Packaging Marks

Mark	Explanation
	Upward: Indicates that the package should be kept upright during transportation and storage.
	Fragile: Indicates that the package contains fragile items and should be handled with care.
	Keep Dry: Indicates that the package should be protected from rain.
	Stacking Limit: The number "1" in the illustration indicates the maximum number of identical packages that can be stacked. Refer to the actual illustration for details.
	Center of Gravity: Indicates the center of gravity of the package to facilitate lifting.

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	Forklift Insertion Point: Insert the forklift here to move the equipment.
	Lithium Battery Mark: Indicates that the device contains lithium-ion batteries or battery packs, which are Class 9 hazardous materials.
	UN3480: A United Nations number indicating that the device contains lithium-ion battery packs.

4.2. Unpacking and Checking

- After receiving the product, please check whether all the delivered components are complete against the "supply list."
- Please check whether the actual received cabinet and the received product model are the same as the ordered model;
- Carefully check whether the product is in good condition. The transportation process may lead to damage due to transportation collisions. If any problem is found, please contact Dyness or the transportation company in time.

Shipping Requirement

- All necessary equipment in the product has been installed and fixed in the cabinet before leaving the factory, and the product can be transported as a whole during transportation.
- Please confirm that the cabinet doors of the equipment are tightly locked before transportation.
- The transportation of a single ESS cabinet requires wooden box packaging, and a reserve buffer between the wooden box and the ESS cabinet.
- Be sure to set up warning signs or caution tape to prevent unauthorized personnel from entering the lifting and transportation area to avoid accidents.
- Remove any existing or potential obstacles during the moving process, such as trees, cables, etc.
- Whenever possible, choose favorable weather conditions for transporting the equipment.

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Requirements for Equipment Transportation Mobility

- Select a suitable crane or lifting tool according to the site conditions. The selected tool must have sufficient load-bearing capacity, arm length, and rotation radius.
- If movement on slopes or similar conditions is required, additional traction devices may be necessary.
- When carrying out ground transportation, be sure to use ropes to secure the top lifting ring of the equipment to the transport vehicle to prevent.

4.3. Lifting Transportation

- This product is equipped with a lifting ring at the top for lifting, and can be transported by lifting. The following requirements must be met when lifting the products:
- Ensure site safety when lifting;
- When lifting and installing, professional personnel should be in charge of the whole process;
- The strength of the slings should be able to withstand the weight of the equipment.
- Ensure that all sling connections are safe and reliable, and ensure that each section of the sling connected to the corner piece is of equal length;
- The length of the slings can be adjusted appropriately according to the actual requirements of the site;
- Make sure that the equipment remains stable and does not tilt during the lifting process;
- The equipment shall be suspended after being lifted from the ground by 300 mm, and check that the lifting device is firmly connected before lifting.
- Take all necessary auxiliary measures to ensure safety.

Caution: The hanging rings need to be installed on site. Please ensure that the hanging ring bolts are tightened before lifting.

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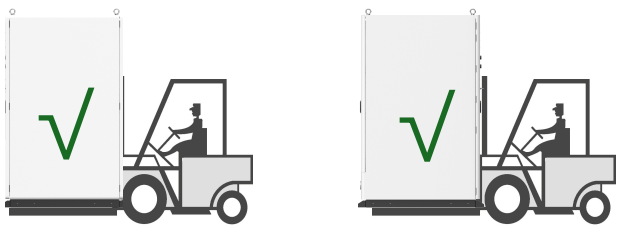
Figure 4-1 Lifting and Transportation Diagram

4.4. Forklift Transportation

The bottom of this product is equipped with fork holes specially designed for forklift transportation. The product can be moved through the bottom fork holes on the front and back. If the installation site is flat, the product can be moved using a forklift. Forklift transportation methods should meet the following requirements:

- The forklift should be equipped with sufficient load capacity;
- The length of the pins should meet the requirements of the equipment;
- The pins should be inserted into the fork holes at the bottom of the workstation;
- Moving and lowering should be slow and steady during forklift transportation;
- Products should only be placed on stable surfaces. The area should be well-drained, free of any obstacles or protrusions.
- Under no circumstances should the unit be moved by inserting the pins into a position other than the fork holes.

Correct Shipping Method:



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False Shipping Method:

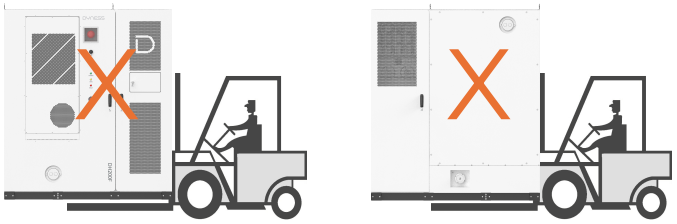


Figure 4-2 Forklift Transportation Diagram

4.5. Storage Requirement

Storage Environment Requirements

- The product should be stored on dry, flat (flatness should be no more than 5 mm), solid ground with sufficient load-bearing capacity and without any vegetation cover;
- To prevent condensation inside the product or soaking of the bottom of the product during the rainy season, the product should be stored on higher ground.
- The basement must be raised, and the specific elevation height should be determined according to the site geology, meteorological conditions, and other conditions.
- Storage environment temperature: 0~+35℃, humidity: 0～95% (no condensation).
- Pay attention to coping with the harsh environment around, such as sudden cold, sudden heat, collision, etc., so as not to cause damage to the PACK.

Storage operation requirements

- Packing boxes should not be tilted or inverted.
- Make sure that the cabinet doors are securely locked before storage.
- Effectively protect the product's air inlet/outlet to prevent rainwater, sand, and dust from entering the interior of the cabinet.
- Due to the capacity decay that occurs during long-term storage, it is not recommended to store batteries exceeding six months.
- For products stored for a long period (more than six months), inspect visually before installation to ensure there is no condensation and verify that the equipment is intact. Additionally, checking after powering on.

NOTE

Starting from the date of delivery, perform one charge and discharge cycle for the PACK every 6 months to maintain the system's SOC of 25%～40%.

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5. Installation and Wiring

Only qualified electrical engineers may perform electrical connection-related work. Please comply with all requirements specified in the "Safety Precautions" section of this manual. The Company shall not be liable for any personal injury or property damage resulting from failure to observe the safety precautions.

DANGER

- Do not touch the live parts!
- Ensure both the AC and DC sides are not energized before installation. All electrical connections must be operated under de-energized conditions.
- Check the polarity of all input cables to ensure that each input polarity is correct before wiring;
- Do not place the equipment on surfaces that are flammable.

WARNING

- The ingress of sand and moisture may damage the electrical equipment inside the ESS cabinet or affect the performance of the equipment!
- During sandstorm seasons or when the relative environmental humidity exceeds 95%, electrical connection work should be avoided.
- Wait until there are no sandstorms and the weather is clear and dry before starting any connection work.
- Avoid pulling or tugging on cables or wires forcefully to prevent damage to their insulation performance during electrical installation.

CAUTION

- All cables and wires should be ensured to have a certain amount of bending space.
- Necessary auxiliary measures should be taken to reduce the stress on cables or wires.
- After completing each step of the wiring operation, careful inspection is required to ensure correct and secure connections.
- All electrical connections must be strictly in accordance with the wiring diagram.

5.1. Installation Environmental Requirements

Site Requirements

- When selecting the installation site, full consideration should be given to the surrounding environment (climate and geological conditions, such as stress wave emission, underground water level, no high cables in the vertical upper part of the installation site, no pipelines or other underground facilities in the lower part of the installation site, and a certain safety distance should be

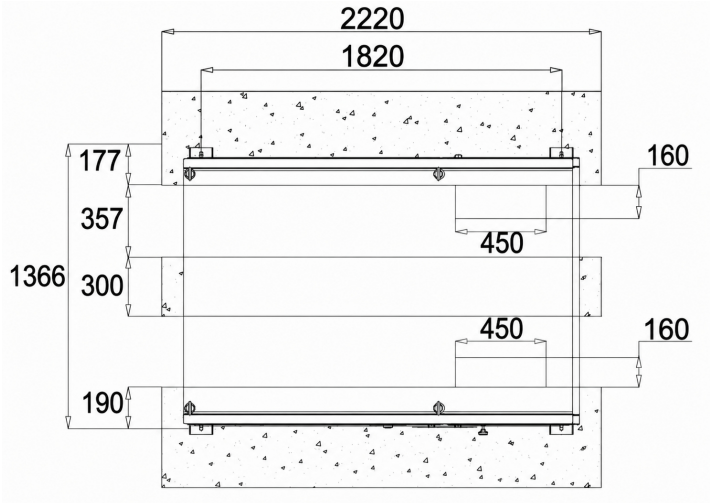
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maintained between the equipment and buildings and people. The length of the distance should be subject to the fire safety regulations of the project.

- The surrounding environment should be dry and well ventilated.
- Please ensure that there are no trees around the installation location to prevent branches or leaves from blocking the doors or air inlets of the energy storage integrated system during strong winds.
- The installation location should be away from toxic and harmful gases and flammable, explosive, corrosive, and dust-intensive materials.
- The installation location should be away from residential areas to avoid noise.

Foundation Requirements

- The foundation must provide sufficient load-bearing support for the equipment, with a bearing capacity of >3t/m², a service life of >50 years, and a level of <3mm/m².
- The height of the base must be greater than the highest historical flood level.
- Drainage facilities should be constructed in accordance with local geological conditions and municipal drainage requirements to ensure that no water accumulates at the base of the equipment. The foundation construction should meet the local maximum rainfall drainage requirements, and the discharged water should be treated in accordance with local laws and regulations.
- The equipment supports a bottom wiring scheme. Users can select an appropriate foundation scheme according to actual needs:
- Bottom Wiring: Normally, the height of the cement base is 300—500 mm. When constructing the equipment foundation, consideration shall be given to the cable routing of the energy storage system, with trenches or cable entry holes reserved. Cables are routed in and out from the bottom of the equipment;
- The center spacing between the front and rear concrete pillars is 1366 mm;
- The width of each concrete pillar is 375 mm;
- The length of the concrete pillar for installing a single DH200F-C260 product is 2220 mm;
- The hole spacing on one side of the concrete pillar is 1820 mm;



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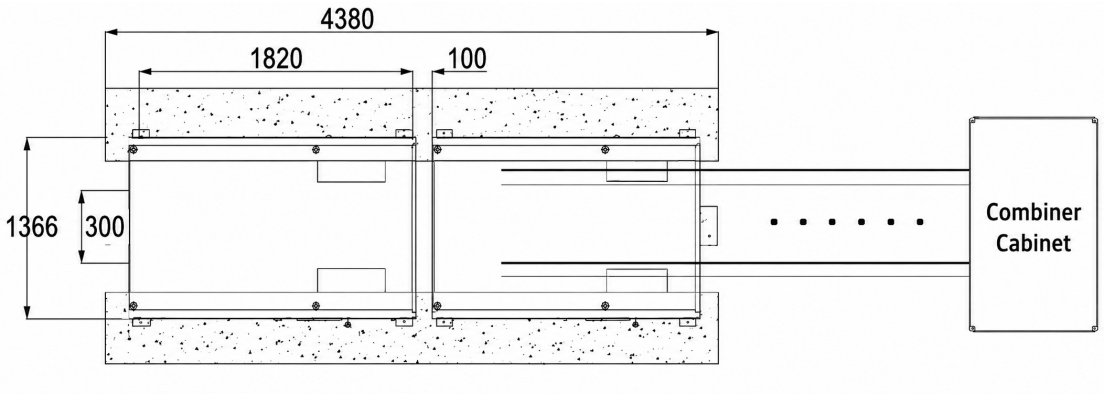
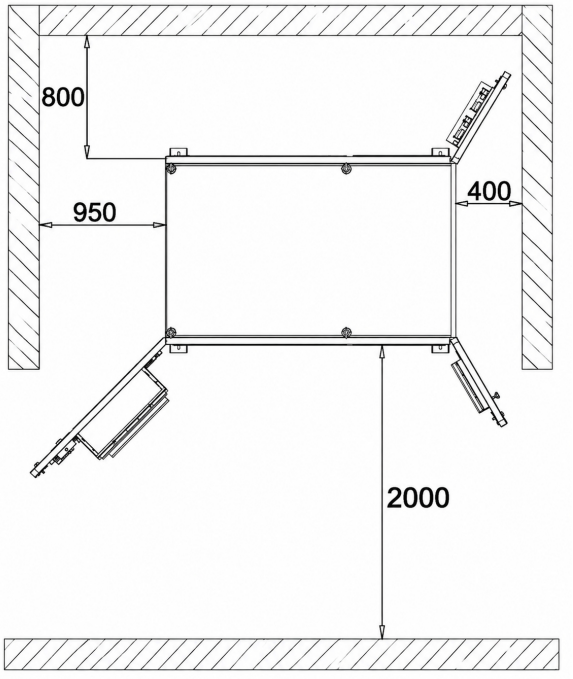


Figure 5-1 Schematic Diagram of Product Base (Top View)

5.2. Installation Spatial Requirements

The product uses front and rear ventilation. To ensure better heat dissipation and maintenance of the equipment, it is recommended to leave sufficient space in front of and behind the cabinet:

- The space reservation distance in front of the product is not less than 2000 mm.
- The space reservation distance at the rear of the product is not less than 800 mm.
- The space reservation distance of the left part of the product is not less than 950 mm.
- The space reservation distance of the right part of the product is not less than 400 mm.
- The product supports side-by-side installation, with a minimum space of 100 mm reserved between cabinets.
- The product supports back-to-back installation, requiring at least 800 mm of clearance between cabinets.



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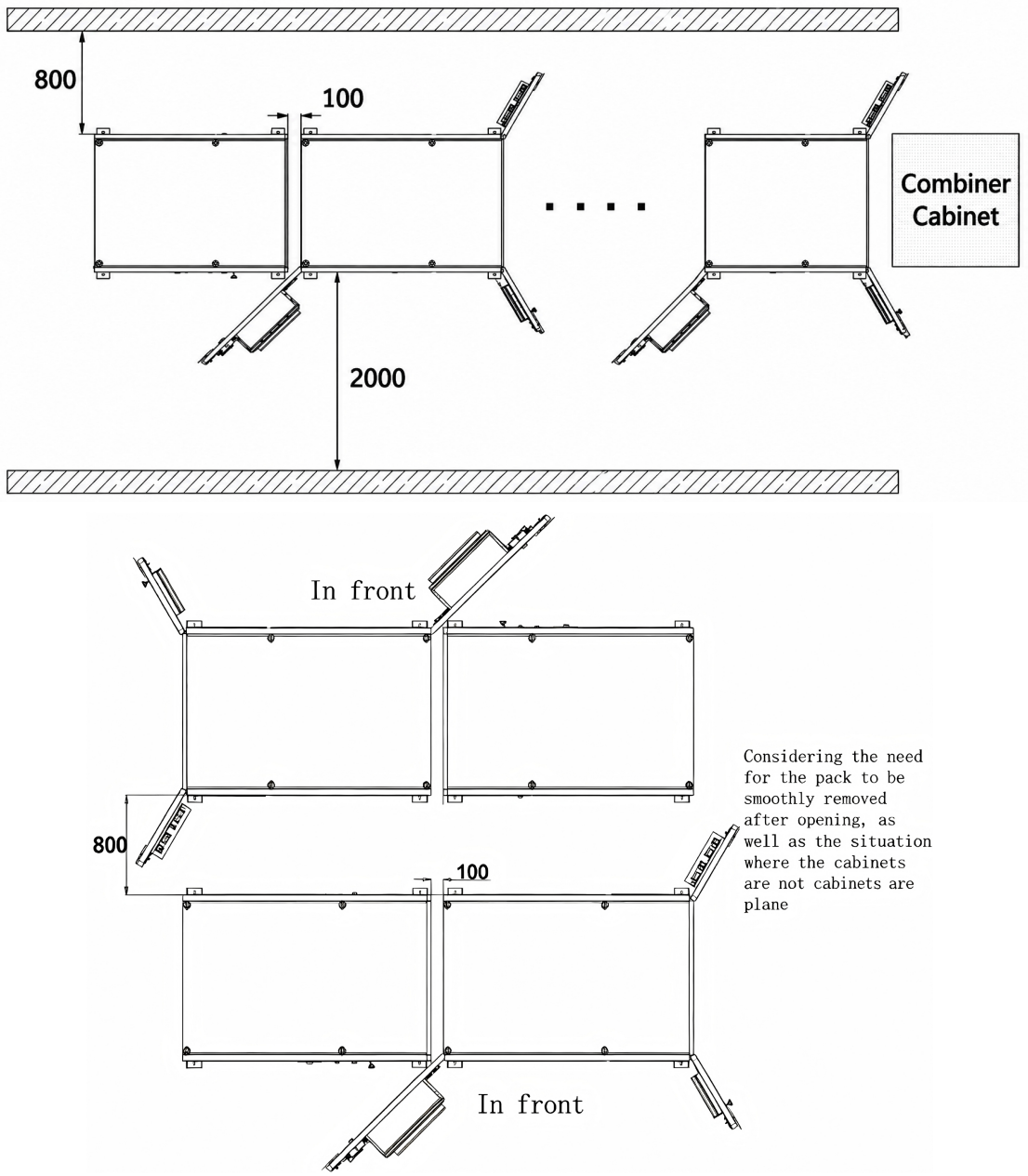


Figure 5-1 Product Installation Space Requirement

5.3. Fixed Installation

5.3.1. Check Before Installation

WARNING

Please comply with local safety regulations and operational rules during installation.

Only complete and undamaged equipment can be installed! Please ensure that before installation:

- The product cabinet itself should be complete and intact.
- All equipment in the cabinet should be complete and intact.

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5.3.2. Angle Steel Fixed Installation

After transporting the outdoor cabinet to the installation location, it must be secured in place. The product cabinet base has four L-shaped angle iron mounting brackets reserved at the front and rear, as shown in the figure below.

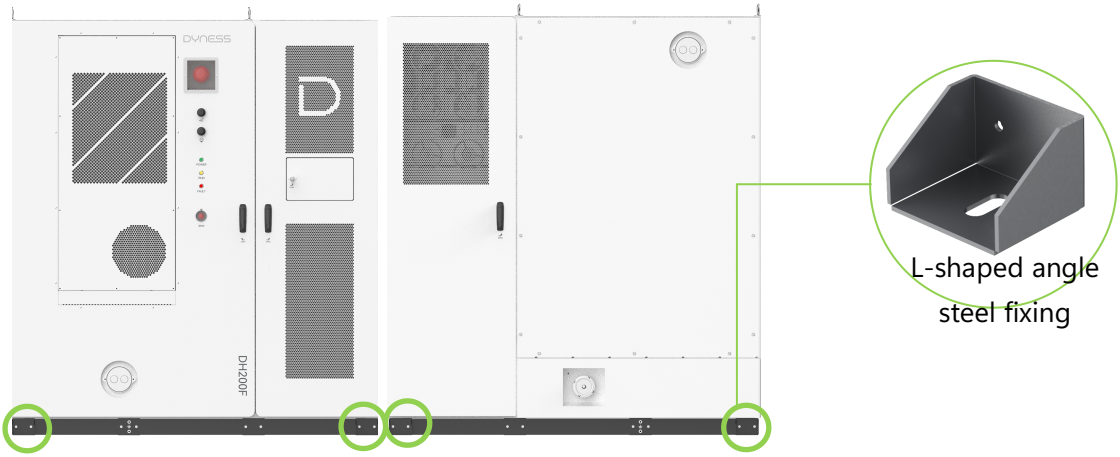


Figure 5-2 Angle Steel Fixing Diagram

Angle steel fixing tool

The following tools may be required for installing the bracket: a marker pen, an electric drill, angle steel, M12 expansion bolts;

The M12 bolts for fixing the L-shaped angle steel and the interface bolts at the mesh end are all supplied as original supporting parts by Dyness along with the equipment.

For the M12 expansion bolts used to fix L-shaped angle steel, the recommended tightening torque is 47 N·m.

Tools are not included in the scope of supply and must be provided by the customer.

Steps for fixing angle steel

① Use a marker pen to mark the drilling positions.

② Choose an electric drill with a diameter matching the bolt's outer diameter, drill holes according to the bolt's length (hole depth slightly greater than the bolt length) until reaching the desired depth for installation.

③ Insert the bolt and expansion sleeve into the hole, tighten the nut to the end of the bolt, and use a wrench to tighten it.

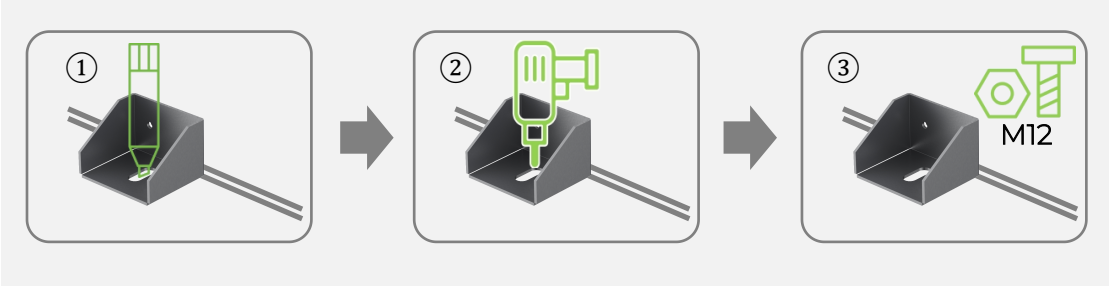


Figure 5-3 Angle Steel Fixing Steps

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5.3.3. Grounding Installation

Grounding methods must comply with local regulations at the installation site. Please consider the actual site conditions and follow the instructions of the power plant staff when installing external grounding.

① Reserve grounding points, which can be implemented using cables or flat steel grounding;

② Use 1 AWG grounding cables. Refer to Section 5.6 “Cable Specification Requirements” of this chapter for grounding cables and terminals;

③ The upper figure shows grid grounding, and the lower figure shows equipment protective grounding.

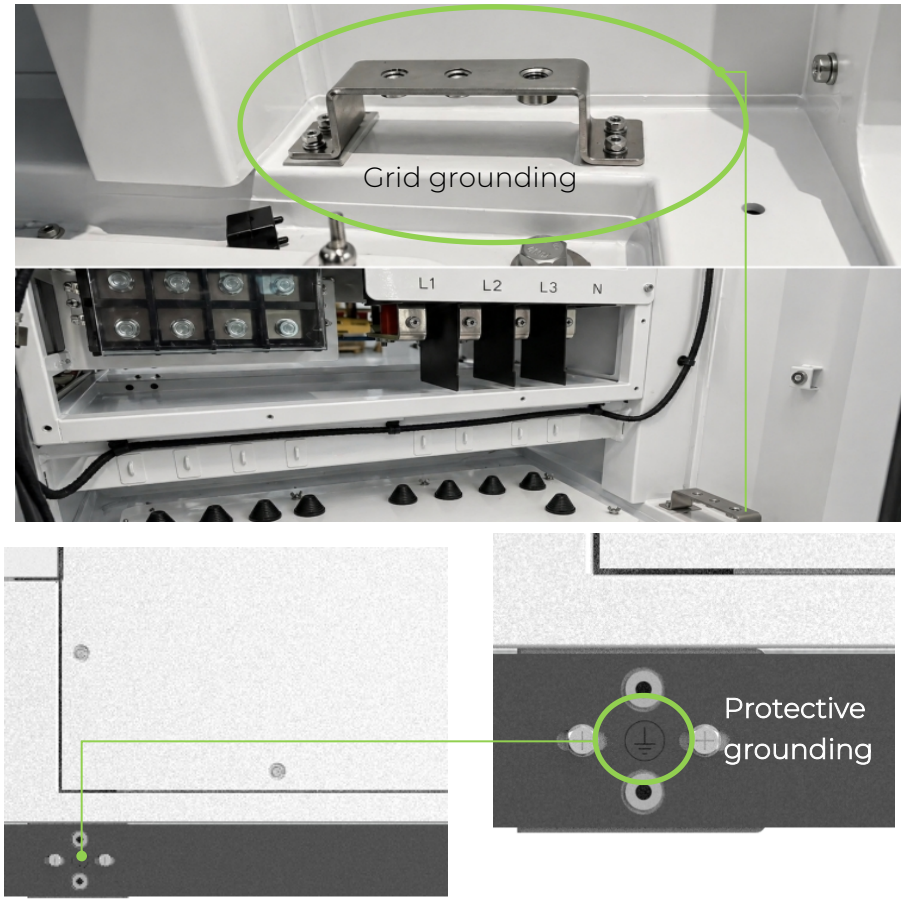


Figure 5-4 Equipment Grounding Diagram

After the grounding connection, the grounding resistance must be measured, and the specific grounding resistance value must comply with relevant regional/local standards and regulations.

5.3.4. Door Operating Procedures

The product cabinet door can only be opened after the product has been securely installed. The steps for opening the cabinet door are as follows:

① Make sure that the equipment is in the locked state.

② Move the lid up above the locking hole.

③ Get the key in the door and turn it clockwise.

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④ Rotating the handle clockwise to the position shown in the figure to open the door.

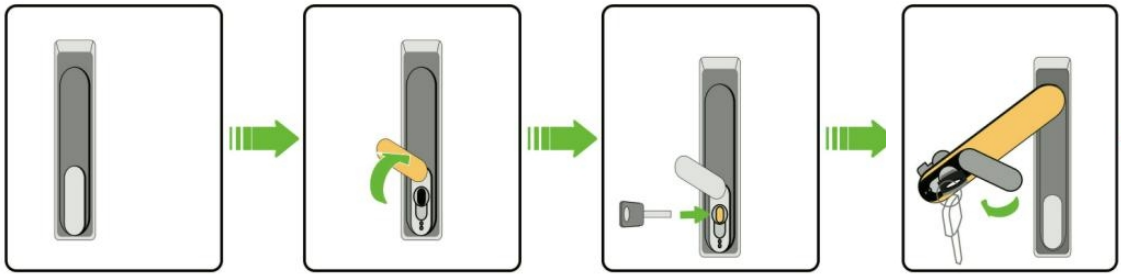


Figure 5-5 Door Open Steps

To close the cabinet door, please refer to the above opening steps (in reverse order) and pay attention to the following warning information!

WARNING

- Before closing the cabinet door, please ensure that there are no foreign objects obstructing it!
- When closing the cabinet door, ensure that both the top and bottom ends are fully closed, otherwise there is a risk of water leakage and rusting inside the cabinet.

5.4. Wiring Tools

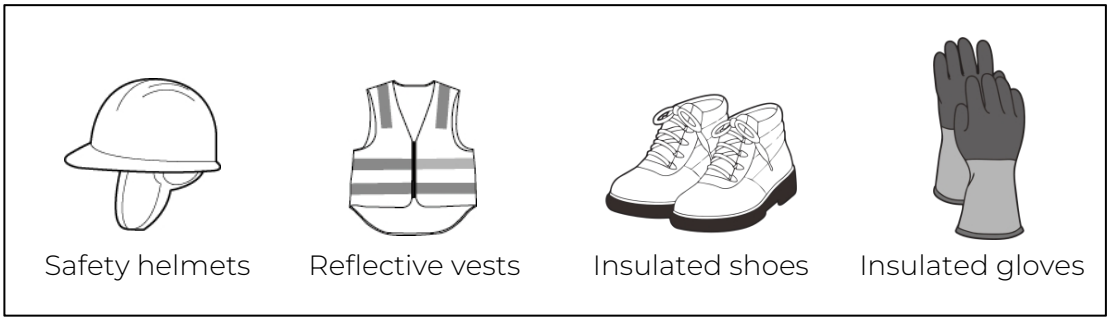


Figure 5-6 Safety Gear

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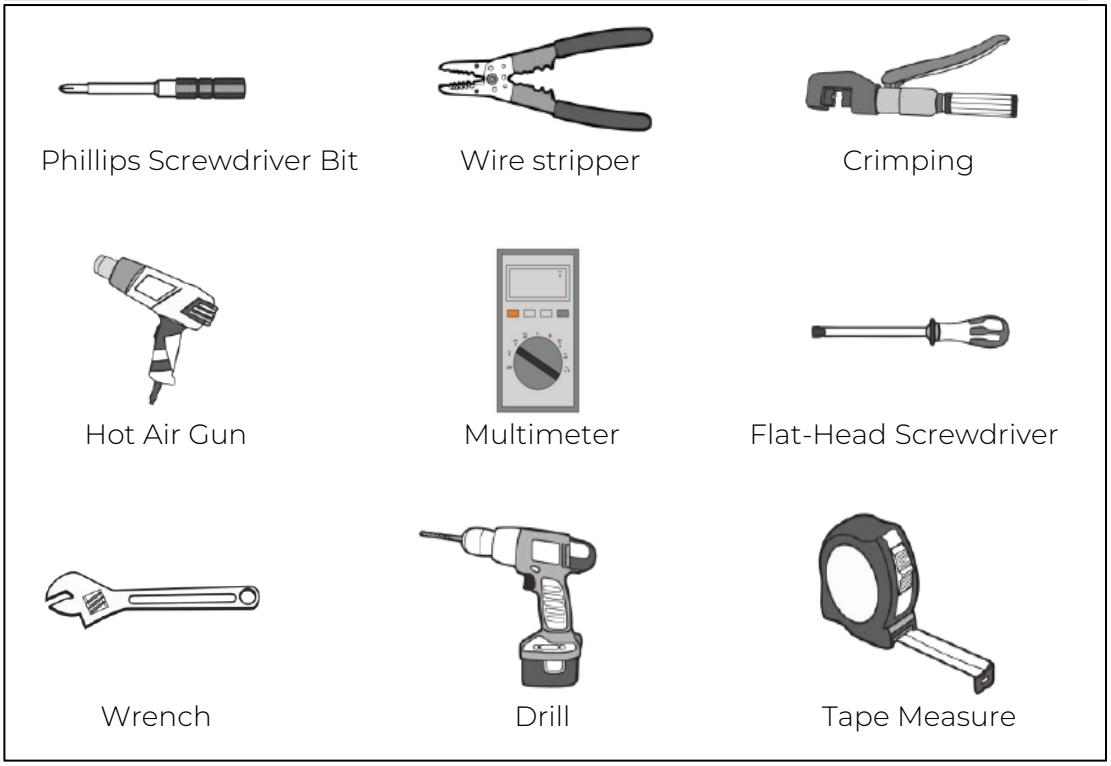


Figure 5-7 Tools

5.5. Wiring Requirements

- Based on the location and dimensions of the cable entry and exit points at the bottom of the product cabinet, sufficient space must be reserved for the AC-side cable tray during foundation construction, and cable conduits must be pre-embedded.
- Determine the specifications and quantity of perforated pipes based on the cable type and the number of incoming and outgoing cables.
- Both ends of all embedded pipes are temporarily sealed to prevent debris from entering and causing inconvenience during subsequent wiring.
- After connecting all cables, the cable entry and exit points, as well as the joints, are sealed with fire-resistant mortar or other suitable materials to prevent rodents from entering.

WARNING

- After completing the wiring, all wiring entry and exit points must be sealed!

5.6. Cable Requirements

- The conductor must have sufficient current-carrying capacity, which includes but is not limited to: environmental conditions, conductor insulation material type, cable laying method, cable material, and cross-sectional area.
- The cable diameter must be selected according to the maximum current-

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carrying capacity, and the length must allow for a margin;

- The specifications and materials of three-phase AC output cables must be consistent;
- Flame-retardant cables must be selected;
- The cables used must comply with local laws and regulations.

Please note: Pay attention to torque during installation. The following accessories, including power cables, control cables, terminals, transformers, etc., are to be provided by the customer.

Table 5-1 Wiring Accessories List

No.	Type	Specifications	Terminal Model	Torque
1	Power cable (On&Off-grid) Grid port	Outdoor single-core copper cable 3/0 AWG*2 (150 mm²)	DT/SC 150-12	28 N·m
2	Power cable (On&Off-grid) Load port	Outdoor single-core copper cable 2/0 AWG (70 mm²)	DT/SC 70-10	20 N.m
3	PV cable	Outdoor single-core copper cable 1/0 AWG (50 mm²)	DT/SC 50-8	12 N.m
4	Grounding cable	Outdoor single-core copper cable/yellow-green dual color 2/0 AWG (70 mm²)	DT/SC 70-8	12 N.m
5	Grounding bar	4*40mm	/	/
6	RS485/CAN communication line	Two-core twisted pair shielded cable 20 AWG	/	/
7	Ethernet communication line	Category 6A network cable	/	/
8	Voltage sampling line	UL1015 cable, 16 AWG	/	/
9	Current sampling line	UL1015 cable 14 AWG	/	/
10	Parallel line	Shielded twisted pair cable, 20 AWG	/	/
11	Direct Meter (400 V)	ADL400-C	/	/
12	Indirect Meter (medium/high voltage)	DTSD1352	/	/
13	Direct CT	0~5000A/5A (The current value depends on the project), work with a direct meter	/	/
14	Indirect CT	0~5A/0~20mA, work with an indirect meter	/	/

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15	Power Cable of Expansion Cabinet	Outdoor single-core copper cable 2/0 AWG		
16	AC Auxiliary Power Cable for Expansion Cabinet	Outdoor single-core copper cable 8 AWG		
17	Voltage Sampling Cable of Parallel Switch Cabinet	Outdoor 4-core copper cable 16 AWG		
18	Parallel Switch Cabinet DO/DI Control Cable	6-core twisted shielded wire 20 AWG		

5.7. Terminal Wiring Method

OT/DT/SC terminals connection steps:

① Peel off the insulation layer from the cable terminal, and the length should be the depth of the wire hole on the copper terminal, plus an additional 2–3 mm.

② Install the heat-shrink sleeve at the cable terminal and insert the exposed copper core part of the stripped wire into the wire hole of the copper terminal (OT/DT terminal).

③ Use hydraulic pliers to firmly crimp the copper terminally.

④ Slide the heat-shrink tube onto the copper terminal (OT/DT terminal) to fully cover the wire hole. Use a heat gun to tighten the heat-shrink tube.

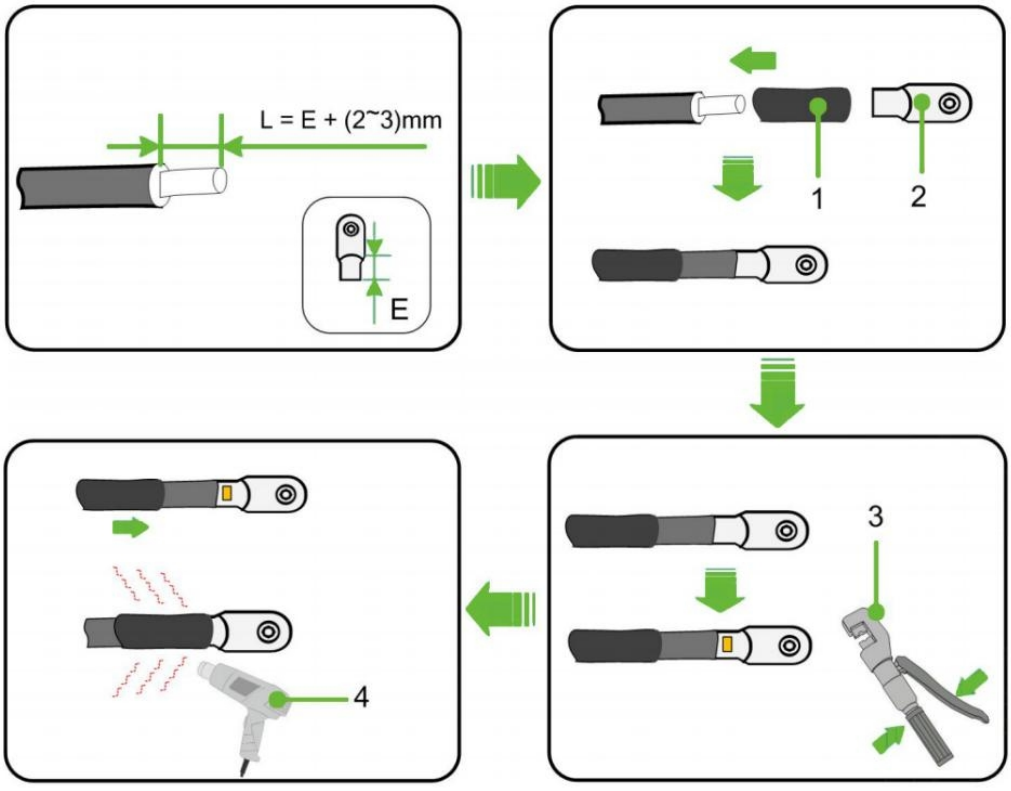


Figure 5-8 The Connection Sequence of Wiring Components

1. Heat-shrink tube, 2:OT/DT/SC terminal, 3: Crimping pliers, 4: Hot air gun

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5.8. Checking Before Wiring

Checking breakers

Please check whether the circuit breakers and other equipment in the following modules are in the OFF position:

① Check the GRID circuit breaker and LOAD circuit breaker (Position 1 at two locations as shown in the figure).

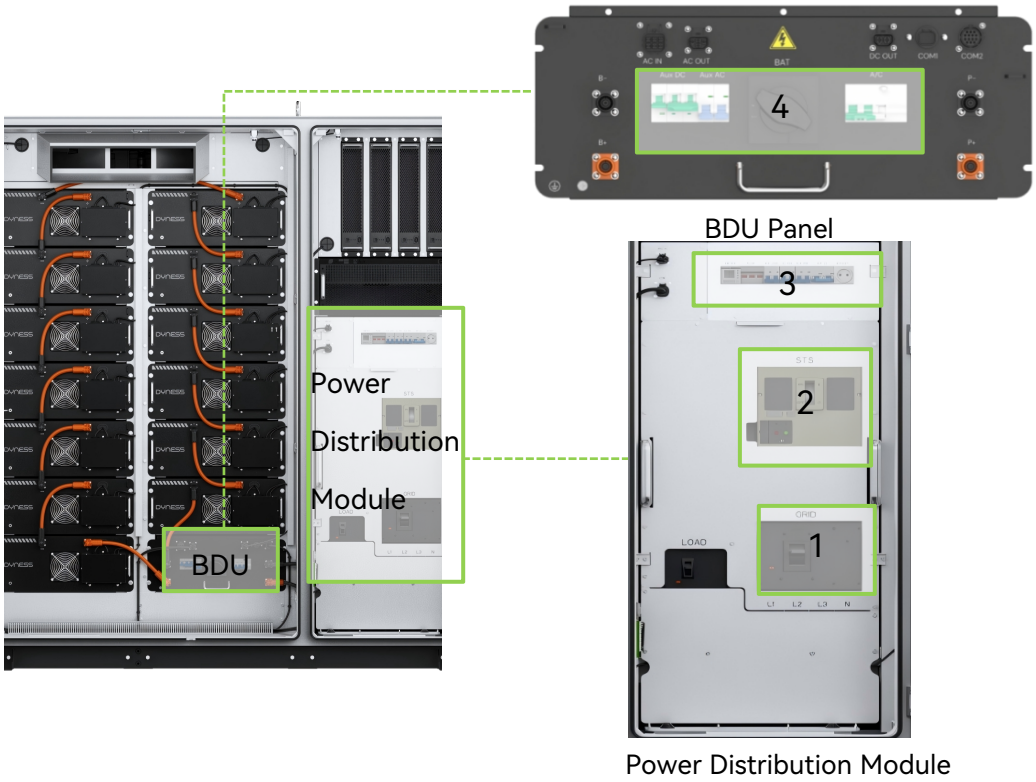
② Check and switch off-grid switch status (as shown in Figure 2);

③ Check the secondary circuit breakers: "AUX LOAD", "AC FAN", "AUX GRID", and "EXP AC" (as shown in Figure 3);

④ Check the BAT battery circuit breaker and the three circuit breakers labeled "AUX AC", "AUX DC", and "A/C" on the battery compartment BDU (as shown in Figure 4).

⑤ Check whether the photovoltaic switches (PV1–PV4) in the rear electrical compartment are in the off state (as shown in the position in Figure 6).

Note: The rear door type SCB lightning protection switch of the cabinet must be kept closed (as shown in Figure 5; open the rear door above the rear electrical compartment for confirmation).



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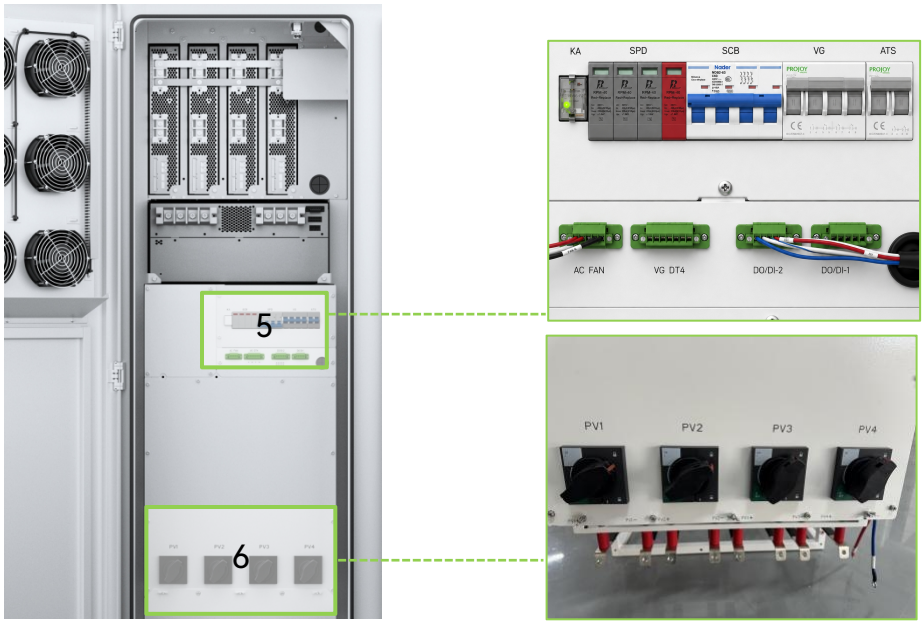


Figure 5-9 Breakers Location Diagram

1) Checking before wiring

Table 5-2 Checking List Before Wiring

No.	Checklist	Confirm
1	The cables and terminals used should meet the requirements of wire diameter and shielding	☐
2	The cables are labeled correctly.	☐
3	The related wiring accessories are ready.	☐
4	The wiring operator has worn protective devices.	☐
5	Checking to see if all the breakers are in the disconnected position	☐

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5.9. Wiring Diagram

The wiring diagram is divided into battery-side wiring and system-side wiring.

Battery wiring

To ensure product safety, the power cable for the battery is shipped separately with the product and must be installed on-site upon delivery:

(1) Ensure that the battery circuit breaker on the BDU is off;

(2) Battery series connection: The battery packs are connected in series, with the negative terminal of each preceding pack linked to the positive terminal of the following pack. The black terminal of the power line must be connected to the negative terminal (black) of the preceding pack, while the red terminal should be connected to the positive terminal (orange) of the following pack. It is essential to ensure the correct connection sequence to maintain proper polarity and system functionality. The designated connection points for the power line terminals are specified in the table below.

(3) Battery to BDU Power Line Connection: After completing the series connection of the PACKs, connect the entire battery cluster to the BDU. The positive terminal of the battery cluster must be connected to the positive terminal of the BDU, and the negative terminal of the battery cluster must be connected to the negative terminal of the BDU. The corresponding power line label designations are indicated in the table below.

Note: The terminal color coding for PACK and BDU is as follows: Orange denotes the positive pole, and black denotes the negative pole.

Table 5-3 Pack Power wiring instructions table

No.	Line marker	Figure Label	Designation	Quantity	Unit
1	WLX50201001	①	PACK series connection line	11	Pcs
2	WLX50201002	②	PACK series connection line-long	1	Pcs
3	WLX50201003	③	System Power Harness to BDU Positive Cable	1	Pcs
4	WLX50201004	④	System Power Harness to BDU Negative Cable	1	Pcs

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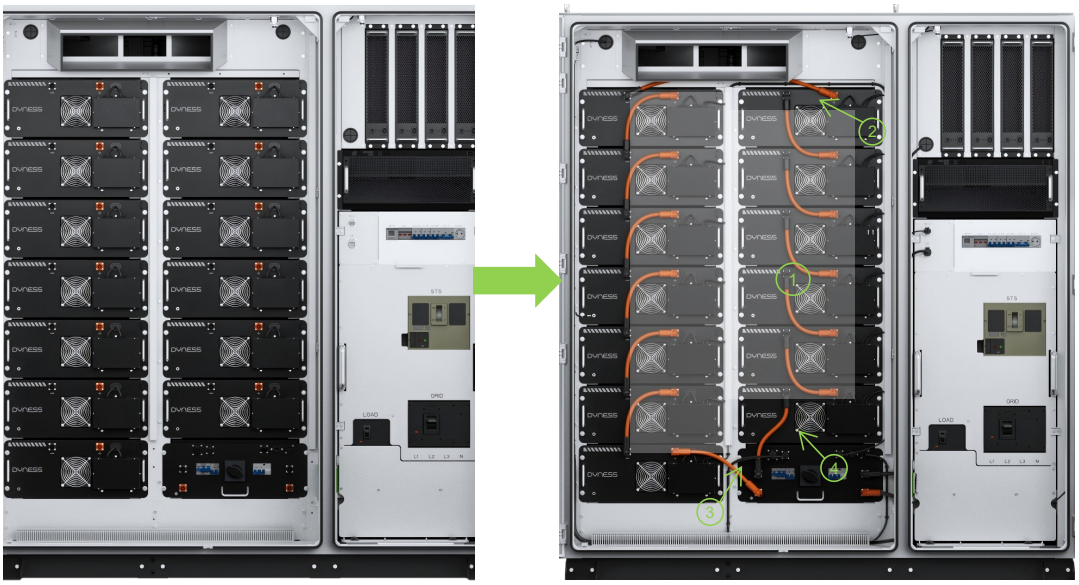


Figure 5-10 Battery Pack Wiring Diagram

Electrical Compartment



Figure 5-11 System Wiring Schematic (Upper: Front of Electrical Compartment; Lower: Rear of Electrical Compartment)

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Table 5-4 System Wiring Function Definitions

Green wireframe: No. 1—4; Yellow wireframe: No. 5—8; (Front door opening) (Order from left to right)

Blue wireframe: No. 9-12; Red wireframe: No. 13–20; (Rear door opening) (Order from left to right)

No.	Port Function Definition	No.	Port Function Definition
1	Load-side phase line L1	12	PV4 isolating switch
2	Load-side phase line L2	13	PV1 connected to the positive terminal
3	Load-side phase line L3	14	PV1 connected to the negative terminal
4	Load-side neutral line N	15	PV2 connected to the positive terminal
5	Grid side phase line L1	16	PV2 connected to the negative terminal
6	Grid side phase line L2	17	PV3 connected to the positive terminal
7	Grid side phase line L3	18	PV3 connected to the negative terminal
8	Grid-side neutral line N	19	PV4 connected to the positive terminal
9	PV1 isolating switch	20	PV4 connected to the negative terminal
10	PV2 isolating switch	21	Load-side Isolator
11	PV3 isolating switch	22	Grid-side Disconnector

Note: For specific wiring steps and methods, please refer to the *Quick Installation Manual*.

5.10. Checking After Wiring

After completing the wiring, in order to avoid damage to equipment and property loss, the following items must be rechecked and measured:

Table 5-5 Checklist After Wiring

NO.	Checklist	Confirm
1	Disconnect the battery switch and grid battery before measuring. Please ensure the AC side and DC side of the PCS are not energized.	☐
2	Check that the connection cables between the battery clusters are secure.	☐
3	Please check if the negative and positive connections between the battery and the PCS, and the AC phase of the PCS, are connected correctly. Measure the resistance between the three phases, which should be in the MΩ level. If it is in the kΩ level or smaller, please check the	☐

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	circuit.	
4	Check if external cables, PE cables, and communication cables are well connected.	☐
5	The PE cable resistance should be less than 4 Ω.	☐
6	Clean the installation area and ensure that there are no tools or other irrelevant objects left inside the ESS cabinet.	☐
7	Use fireproof and waterproof materials to tightly seal the cable entry holes and surrounding gaps of outdoor cabinets.	☐

6. Power-on and Power-off

6.1. Power-on Process

Precautions:

- The product can only be put into operation after being confirmed by professionals and approved by the local power department.
- For products with a long shutdown time, before powering on, a comprehensive and detailed inspection must be carried out on the equipment to ensure that all indicators meet the requirements before powering on.

Check before power-on:

Table 6-1 Checklist Before Power-on

NO.	Checklist	Confirm
1	Check if the wiring is correct;	☐
2	Check if the emergency stop button is released;	☐
3	Check if the SPD switch is in the closed state;	☐
4	Check the PE cable connection to make sure there are no ground faults;	☐
5	Check if the AC and DC voltages meet the start-up conditions and there is no risk of over-voltage with a multimeter;	☐
6	Check to make sure no tools or parts are left inside the device.	☐
7	Check if there is condensation. If so, open the ESS cabinet for ventilation until the condensation disappears;	☐
8	Check if the air conditioner is in a normal state and there is no abnormal sound;	☐
9	Check if there are no wire ends, metal shavings, and other objects that may cause short circuits in signal or power cables.	☐

Power-on steps (Grid—Battery—PV—Load)

- Step 1: Close the "GRID" switch of the electrical compartment (AC side circuit breaker);

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- Step 2: Close the "Aux DC", "Aux AC", and "BAT" (battery side circuit breaker) on the battery compartment BDU in sequence.
- Step 3: Close the electrical compartment circuit breakers from "AUX LOAD" to "EXP AC" in sequence (a total of four secondary circuit breakers).
- Step 4: Close electrical compartments "FK1" and "VG" (lightning arrester, rear opening door of the electrical compartment);
- Step 5: Close the electrical compartment "PV1" to "PV4" (PV side circuit breakers, located at the rear access door of the electrical compartment);
- Step 6: Close the "LOAD" switch of the electrical compartment (load-side circuit breaker).
- Step 7: Configure the EMS operating mode and other parameters according to the application conditions, and set the EMS to operate in automatic mode after configuration.



Figure 6-1 Power-on Operation

After operating the steps one by one, check whether the indicator light of the product is on and whether the screen is displayed. If the product status is normal, the "POWER" and “RUN" indicator lights are on, and the "FAULT” indicator is off. The screen starts to display the system running status and parameters.

6.2. Power-off Process

Power-off steps (Load—PV—Battery—Grid; the operation process can be referenced in the product power-on process diagram)

- Step 1: Shut down the system via the screen or upper computer;
- Step 2: Turn off the "LOAD" switch (load-side circuit breaker) in the electrical compartment;

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- Step 3: Turn off "PV1" to "PV4" in the electrical compartment (PV-side circuit breakers, accessible via the rear door of the electrical compartment);
- Step 4: Close "FK1" and "VG" in the electrical compartment (lightning protection circuit breakers, accessible via the rear door of the electrical compartment);
- Step 5: Turn off "AUX LOAD" to "EXP AC" in sequence in the electrical compartment (a total of four secondary power circuit breakers);
- Step 6: Turn off "Aux DC", "Aux AC", and "BAT" on the BDU of the battery compartment in sequence (battery-side circuit breakers);
- Step 7: Turn off the "GRID" switch in the electrical compartment (AC-side circuit breaker)

WARNING

After operating step by step, the system will stop running, and the product indicators and screen will go out. After the inspection is completed, wait for five minutes to perform maintenance and inspection operations.

6.3. Emergency Stop

Press the "EPO" red button on the front door when there is an emergency.

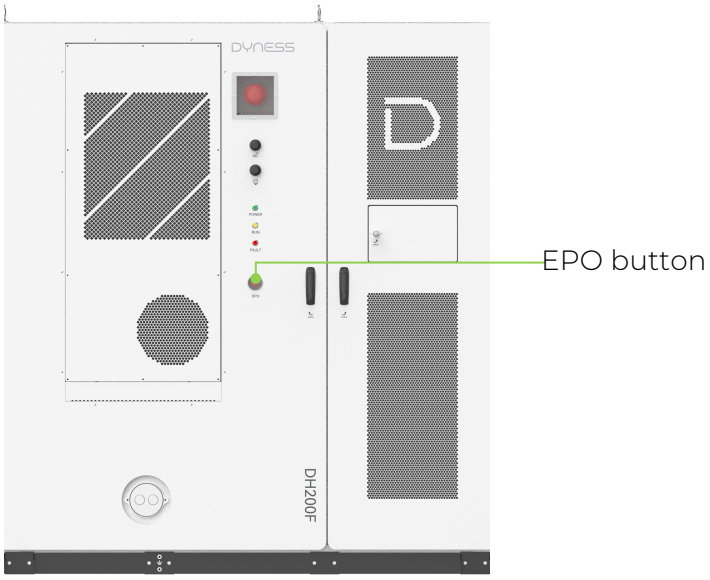


Figure 6-2 EPO Location

WARNING

Under normal circumstances, please use the normal shutdown procedure to power off the product!
In emergency situations, it is necessary to use EPO to ensure a quick response and protect personal and equipment safety!

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7. HMI Operation

7.1. Main Features Overview

The HMI screen serves as the core interface for operators to interact with the system. It is designed to deliver capabilities including real-time monitoring, operational control, status diagnosis, and system configuration, ensuring the safe, efficient, and stable operation of the system. It is divided into seven main categories: self-consumption for own use, full grid connection, peak shaving and valley filling, timing playback, time-sharing mode, third-party EMS control, and third-party VPP control. The seven operating modes are as follows:

① Self-Consumption

When the system is in self-consumption mode, photovoltaic power generation prioritizes meeting local real-time load demand, that is:

- When $P_{PV} > P_{load}$, excess energy is used to charge the ESS;
- When $P_{PV} < P_{load}$, the ESS discharges to the load to supplement the shortfall in PV power.

② Full Grid Feed

All electric energy generated by the solar-storage system is not supplied to local self-use loads. Both the power generated by photovoltaic power generation and the subsequent discharged power from energy storage are fully integrated into the public power grid. This is an operation mode with no local on-site consumption and all electric energy transmitted through a unified grid connection.

③ Peak shaving

The system purchases electricity from the grid for charging and energy storage during periods of low grid electricity prices and low power consumption load; it discharges power to supply loads during peak electricity prices and peak user power consumption periods. This approach curbs power consumption peaks, fills load valleys, reduces electricity purchase costs during peak hours, and optimizes the supply-demand balance of grid load.

④ Sch. Charging and Discharging

Scheduled charge-discharge is an operation control mode of the energy storage system that automatically switches between charging and discharging within set time periods based on a preset fixed time strategy. It does not rely on real-time load or dynamic electricity price regulation but only executes established charge and discharge commands through timing logic and is suitable for scenarios with fixed peak-valley electricity prices and standardized time-sequence energy consumption.

⑤ Time-of-Use

The energy storage system divides multiple time periods in advance and configures corresponding charging and discharging strategies according to the grid time-of-use electricity price and grid dispatching time sequence rules. The system automatically switches among charging, discharging, and standby idle operating states at time nodes, forming a standardized operation and control mode to realize electricity price arbitrage and adapt to grid time-shared load

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regulation.

⑥ Third-party EMS Control

An energy management system developed by an external, independent third party connects to the energy storage system EMS via standard communication protocols. The PCS, energy storage batteries, photovoltaics, power grid, and user loads are transmitted to the third-party EMS through the energy storage system EMS. The third-party EMS issues power scheduling, charge-discharge strategies, operating limits, and start-stop commands, adopting a control mode that fully overall plans and manages the overall operation logic and working conditions of the photovoltaic-energy storage system.

⑦ Third-party VPP control

A control mode in which third-party aggregators, independent of the original manufacturers of energy storage equipment and power grid enterprises, access multiple distributed energy storage systems and associated DERs (Distributed Energy Resources) through a Virtual Power Plant (VPP) platform via standard communication protocols to realize resource aggregation, collaborative optimization, and remote dispatching. The system receives grid frequency regulation/peak shaving instructions or power market signals and issues charging and discharging power, SOC limits, as well as start-stop commands to each energy storage unit. On the premise of ensuring local energy consumption safety, it participates in grid auxiliary services and market transactions to maximize the overall benefits of the cluster, while providing flexible regulation capability for the power grid. Its core features include cross-subject aggregation, independent decision-making, and market-oriented operation, which distinguish it from the single equipment control mode of the original manufacturer's EMS and the direct control mode of the power grid.

7.11 Accessibility Features Overview

① Anti-reflux

For application scenarios where photovoltaic power generation is not allowed to feed into the power grid, the EMS controller prioritizes supplying power from photovoltaic generation to the load, with excess electricity charged into the energy storage system. When the energy storage system and loads cannot absorb the power surplus, photovoltaic power generation is restricted to prevent it from feeding into the power grid. "General Anti-Reverse Power Flow" and "Critical Anti-Reverse Power Flow" are two anti-reverse power flow strategies adopted in Daqin Shuneng industrial and commercial energy storage products, with their specific definitions as follows:

- General Anti-reverse Function: When reverse current occurs, the energy storage system reduces its output power to zero and does not perform charging operations.
- Reverse Current Protection: When reverse current occurs, the energy storage system reduces its output power and switches to charging mode until the maximum charging power is reached.

② SOC Protection Enable

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Configuring the system SOC can balance system availability, maintain battery service life, and enhance battery safety.

③ Demand Control Enable

Set the required maximum power, limit the upper limit of power, so as to reduce the basic electricity fee payment.

④ Grid Charging Battery Power Limit & Self-owned Photovoltaic Charging Battery Power Limit

- The preset upper limit of maximum allowable charging power when the energy storage system draws power from the public grid to charge the battery. It is used to restrict the charging power input to the energy storage battery from the grid side, avoid over-power operation, comply with grid connection specifications and equipment rated capacity, and ensure the safe operation of the system and the power grid.
- When the power output from the self-built on-site photovoltaic power station charges the energy storage battery, it refers to the set maximum charging power threshold on the photovoltaic side. It is used to limit the charging rate of photovoltaic energy input into the battery, stabilize fluctuations in photovoltaic output, protect battery cells and PCS equipment, and prevent performance degradation and potential safety hazards caused by over-power charging.

⑤ Off-grid cut-off SOC

When the energy storage system operates in an off-grid and isolated grid mode, it refers to the preset upper limit threshold of state of charge for battery charging cut-off. When the battery SOC rises to this set value, the system automatically cuts off the charging circuit of the battery from photovoltaic power or standby power supply and prohibits further charging. This measure prevents overcharging and overvoltage of battery cells, ensures the safe service life of the battery, and maintains the steady state of energy supply and demand between power sources and loads under off-grid operating conditions.

Table 7-1 Description of Basic Operation Mode Settings

Settings	Description
System Parallel Enable	· Disable: The system limits parallel operation · Enable: The system activates the parallel operation function
Grid Power Absorption Limit & Grid Feed-in Power Limit	• When the energy storage system absorbs electric power in reverse from the public power grid, the set maximum active power threshold is used to restrict the input power from the grid to the system, avoid high-power impact on the power grid, comply with grid-connected technical specifications, and limit the maximum purchased power from the municipal power grid simultaneously. • When the energy storage system feeds electric power forward to the public power grid (surplus power / energy storage discharge connected to the grid), it refers to the set upper limit of maximum grid-connected output

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	power, which restricts the transmission capacity of reverse power flow, meets the grid connection requirements, and prevents fluctuations in grid voltage and frequency caused by excessive power feedback.
Anti-reflux & Anti-reverse Strategy & Anti-reverse Power	Anti-reflux, anti-reverse strategy, and anti-reverse power settings can be configured as required: • Disable: Anti-reflux protection is not enabled • Enable: Activate anti-reflux protection • General Anti-Reverse: When reverse current occurs, the energy storage system reduces output power to zero without performing any charging action • Critical Anti-Reverse: When reverse current occurs, the energy storage system reduces output power and switches to charging mode until the maximum charging power is reached
SOC Protection Enable Max SOC Cut-off for Charge and Discharge (%)	Set SOC Protection: • Disable: Do not enable SOC protection • Enable: Turn on SOC protection, and set the maximum and minimum SOC limits for charging and discharging
Demand Control	Set Demand Control Enable Function: • Disable: The system turns off the demand control function • Enable: The system activates the demand control function Demand Control Modes: • Static: A fixed maximum demand threshold is preset, and the energy storage system takes this fixed value as the control reference • Dynamic: Based on real-time load sampling, historical power consumption curves, and periodic demand prediction algorithms, the maximum demand set value is adaptively corrected in real time, and the charging and discharging power of energy storage is dynamically adjusted (Demand control hysteresis and demand power limit values for 12 months of the year can be configured)
Basic Operation Mode	Grid Charging Battery Power Limit: The preset upper limit of the maximum allowable charging power. Self-owned Photovoltaic Charging Battery Power Limit: The set maximum charging power threshold on the photovoltaic side. Off-grid Cut-off SOC: The preset state of charge threshold for the upper limit of battery charging cut-off. Power Closed-loop: • Disable: Turn off the function of continuously correcting output power • Enable: Activate the function of continuously correcting output power and dynamically adjusting PCS operating parameters Three-phase unbalance: • Disable: Deactivate the balance control of three-phase

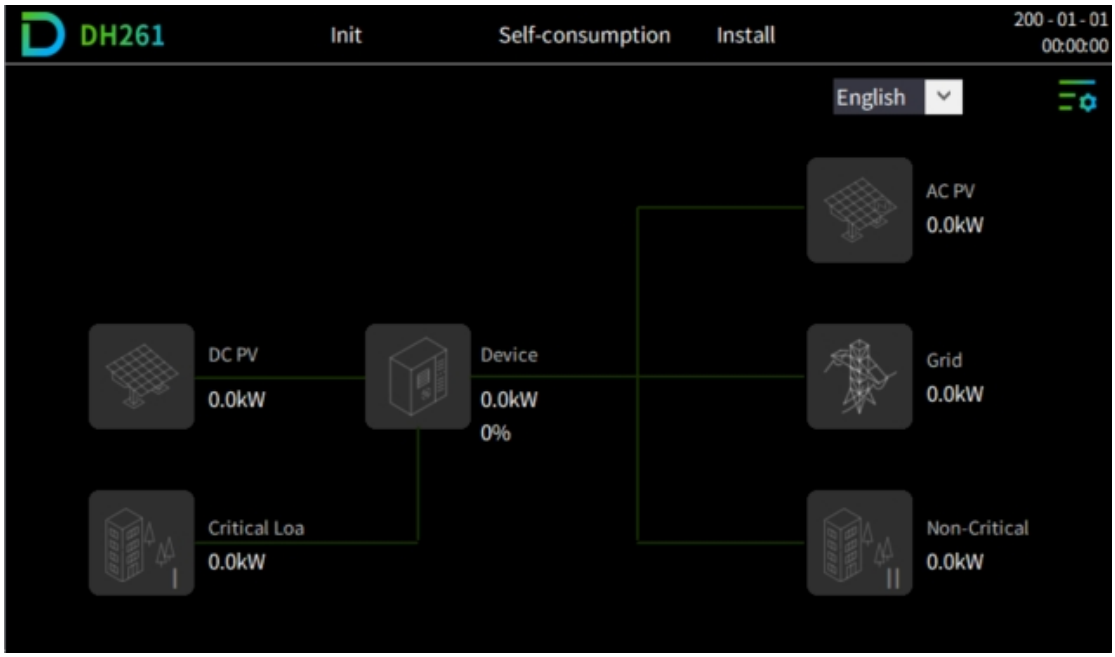
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	voltage and current in amplitude and phase angle · Enable: Allow asymmetry of three-phase voltage and current in amplitude and phase angle Power Control Priority: · Disable: Turn off the multi-level scheduling sequence preset by the energy storage management system · Enable: Activate the multi-level scheduling sequence preset by the energy management system Backup Power SOC Enable: · Disable: Deactivate the emergency backup power function of the energy storage system · Enable: Activate the emergency backup power function of the energy storage system Backup Power SOC (%): The configurable limit value of backup power SOC

7.2. Operation System Overview

The product is equipped with a 7-inch HMI screen, which allows users to view the operating information of each module of the system and configure system parameters. The following is a display and introduction of the HMI screen's main page:

- Dashboard: Display the details of the system access device;
- Data: Query the detailed data, alarm information, and version information of each sub-module of the system;
- Setting: Setting the related system parameters (please note that the user can only change the EMS parameters);
- Login: The permission to login to the system.



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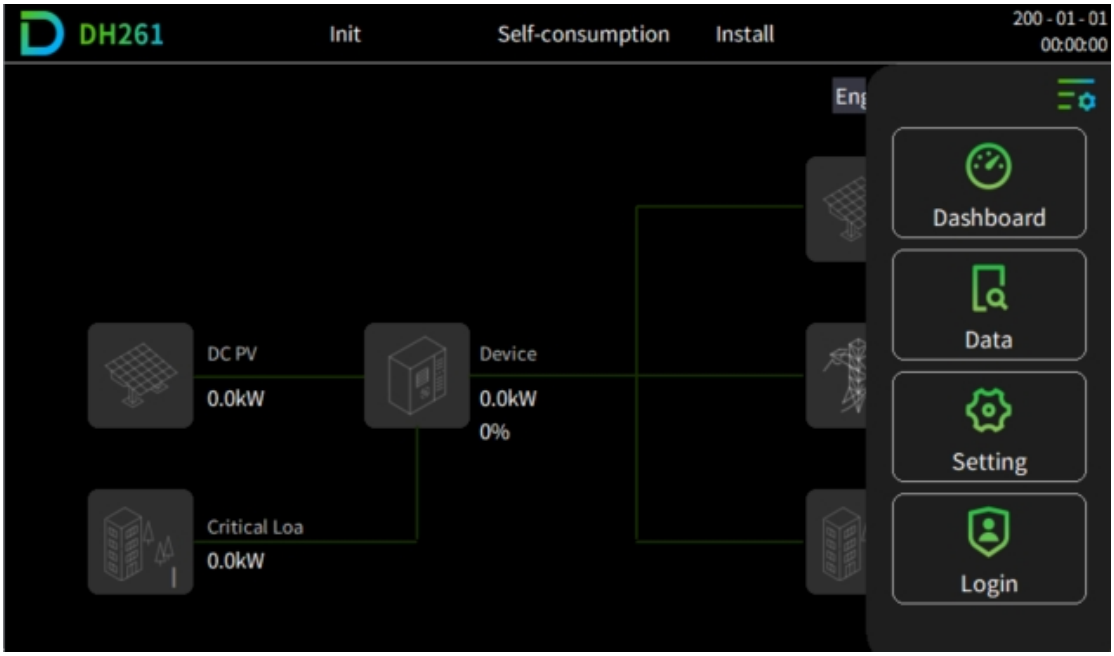


Figure 7-1 HMI Main Interface (Total 2 pages)

Note: The image is for reference only. The actual interface may differ. Please refer to the actual interface for details.

Table 7-1 HMI Interface Overview

Main window	Main menu	Level 1 sub-menu	Level 2 sub-menu	Level 3 sub-menu
Main interface	Dashboard	Grid		
		PCS		
		Battery		
		Load		
		PV-DC		
		PV Inverter		
		Gen		
	Data	EMS	Status	
			Parallel	
			INV/CHG data	
			S-P-F-V data	
		PCS data	PCS data	
		MPPT data	MPPT1	
			MPPT2	
			MPPT3	
		BMS data	Basic	
			Volt	
			Temp	
			Alarm	
		System data	Meter	
			Fire protection	

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			Air conditioner	
			Temperature and humidity	Basic
			Circuit breaker	Alarm
		Alarm Info		
		Version Info		
	Setting	EMS	Run Settings	Self-Consumption
				Full Grid Feed
				Peak shaving
				Sch. C/D
				Time-of-Use
				Third-Party EMS
				Third-Party VPP
			System Settings	Basic Set
				Network
				Regain
	Login	Account		
		Security & Password		

Please note: The HMI interface may vary with version updates. The images in this chapter are only for reference.

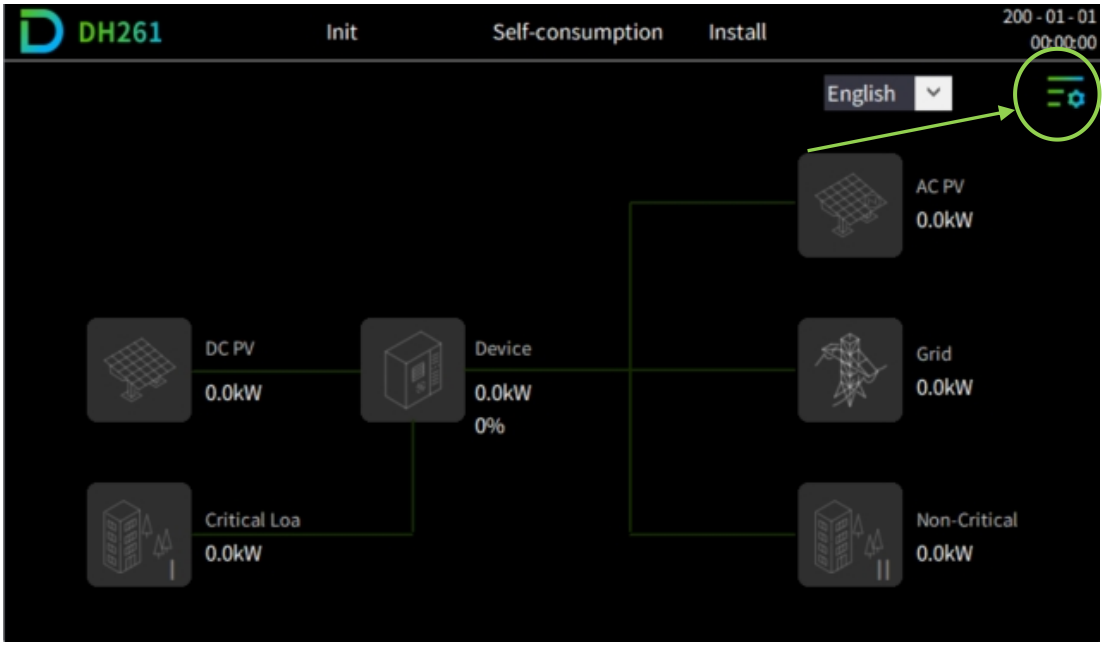
7.3. Operating Instructions

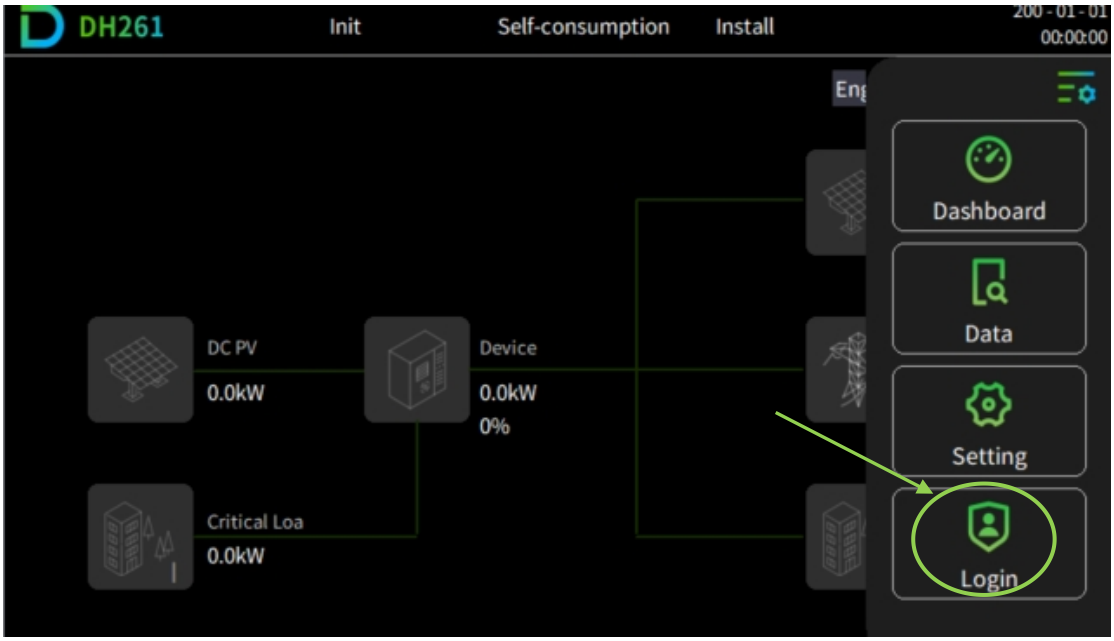
7.3.1. User Login

- Step 1: Click the main menu icon  on the upper right corner of the main interface;
- Step 2: Click "Login" to enter the user interface under the main menu bar;
- Step 3: Select "Install", input the password (1111), click "Login";
- Step 4: Click "Confirm" in the prompt popup.

——END

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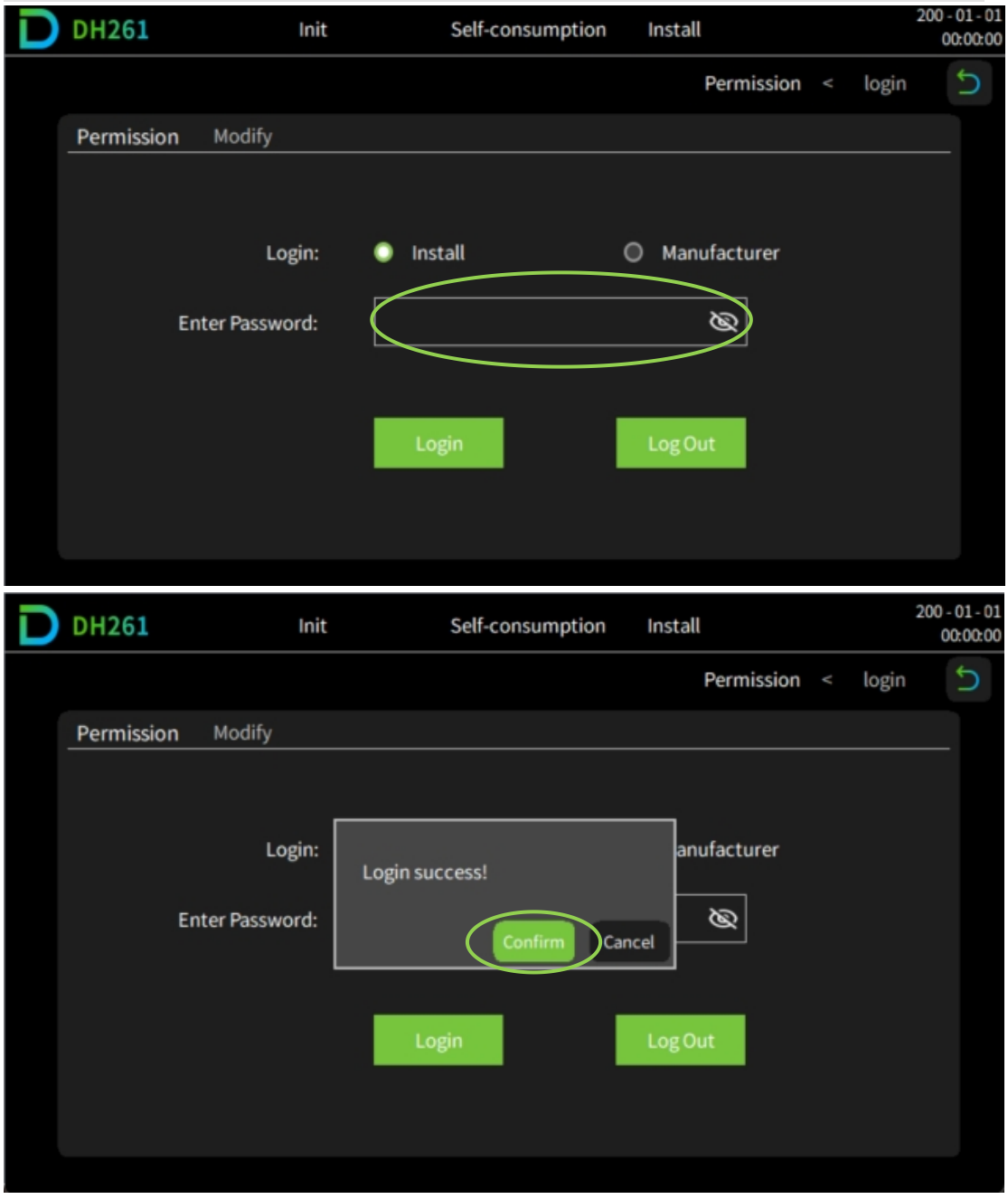


Figure 7-2 User Login Diagram (Total 4 pages)

7.3.2. Password Change

- Step 1: Login to the "Install" (7.3.1 “User Login” for reference);
- Step 2: Click “Security & Password” at the upper left of the navigation bar;
- Step 3: Input the old password and new password, complete the setting, then click "Confirm Modification".

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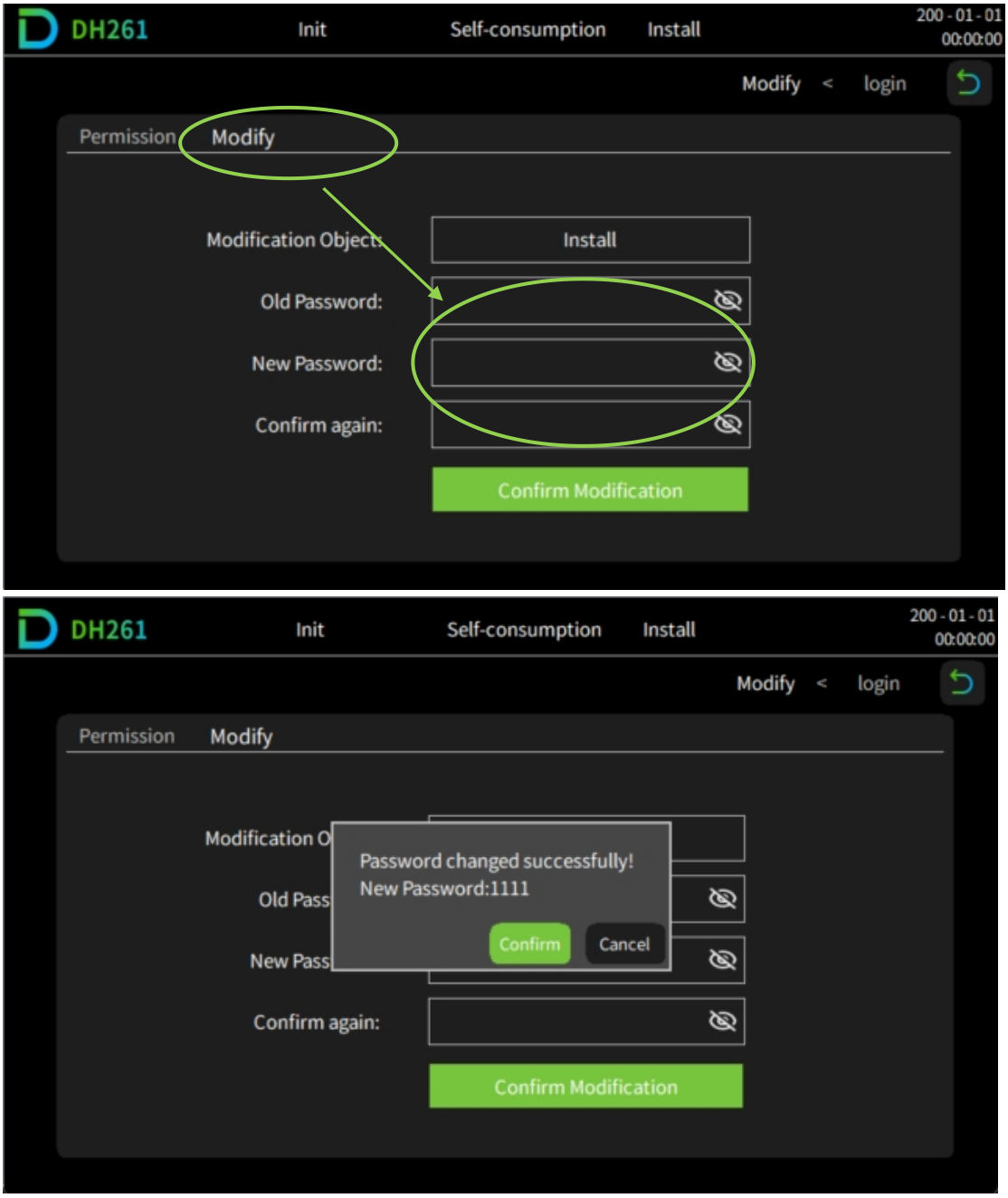


Figure 7-3 Password Change Diagram

7.3.3. Running Information

- Step 1: Click the main menu icon on the upper right corner of the main interface;
- Step 2: Click "Dashboard" under the main menu bar;
- Step 3: Select the corresponding sub-menu as needed.

——END

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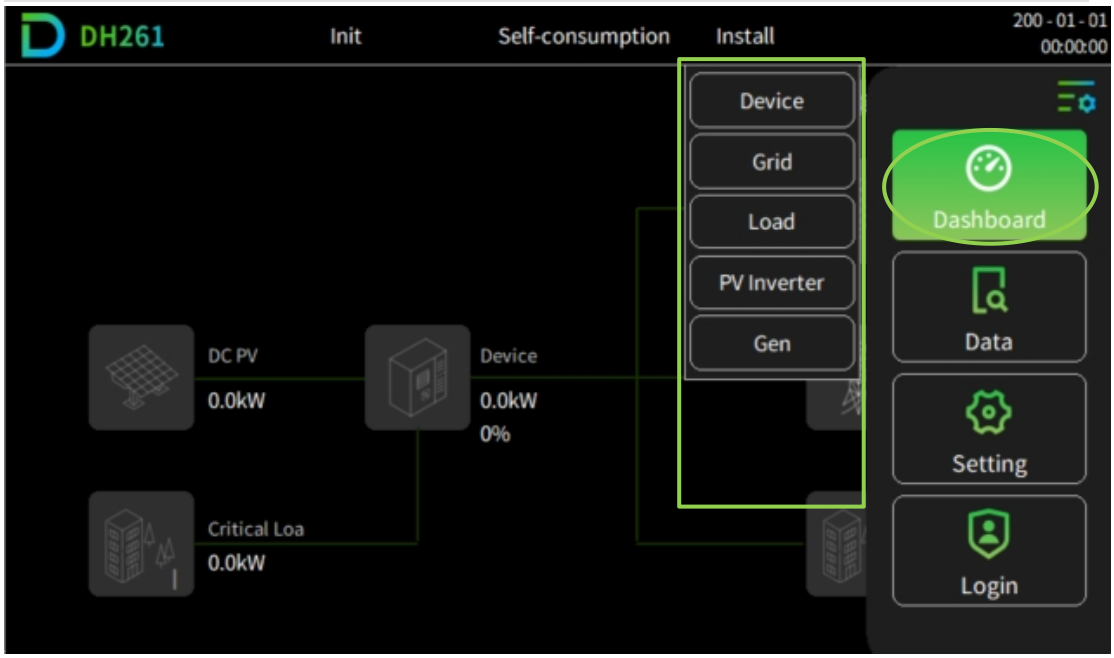


Figure 7-4 Running Information Diagram

7.3.4. Query Data

- Step 1: Click the main menu icon on the upper right corner of the main interface;
- Step 2: Click "Data" under the main menu bar;
- Step 3: Select the corresponding sub-menu as needed. EMS, PCS, MPPT, BMS, system data, alarm information, and version information can be queried.

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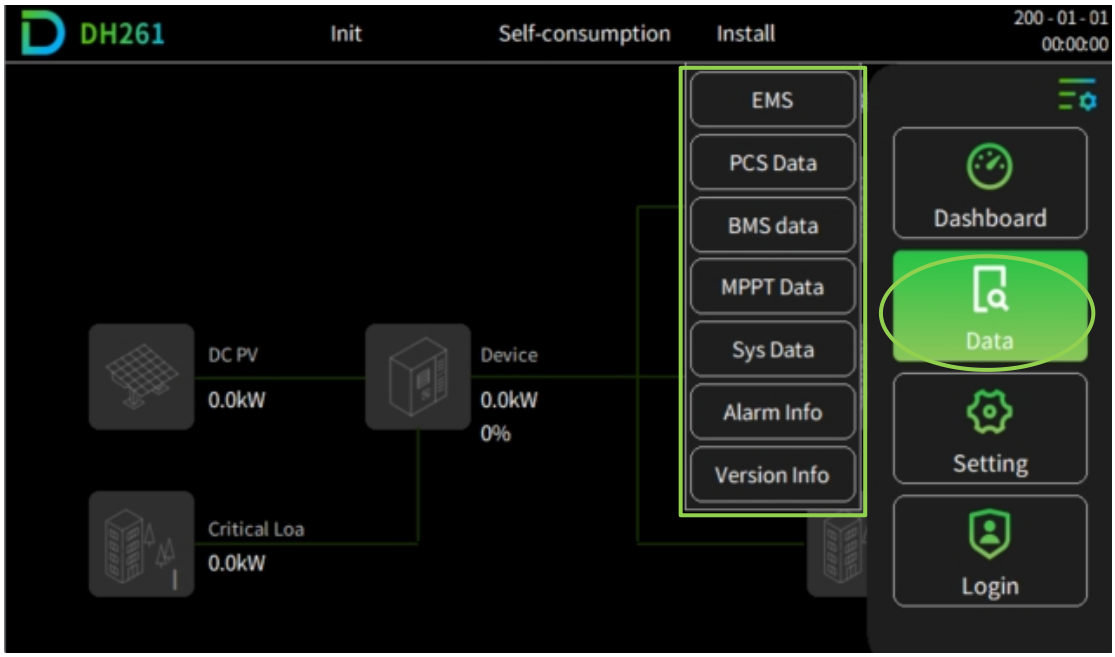


Figure 7-5 Query Data Diagram

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7.3.5. Setting (Network IP settings)

System settings

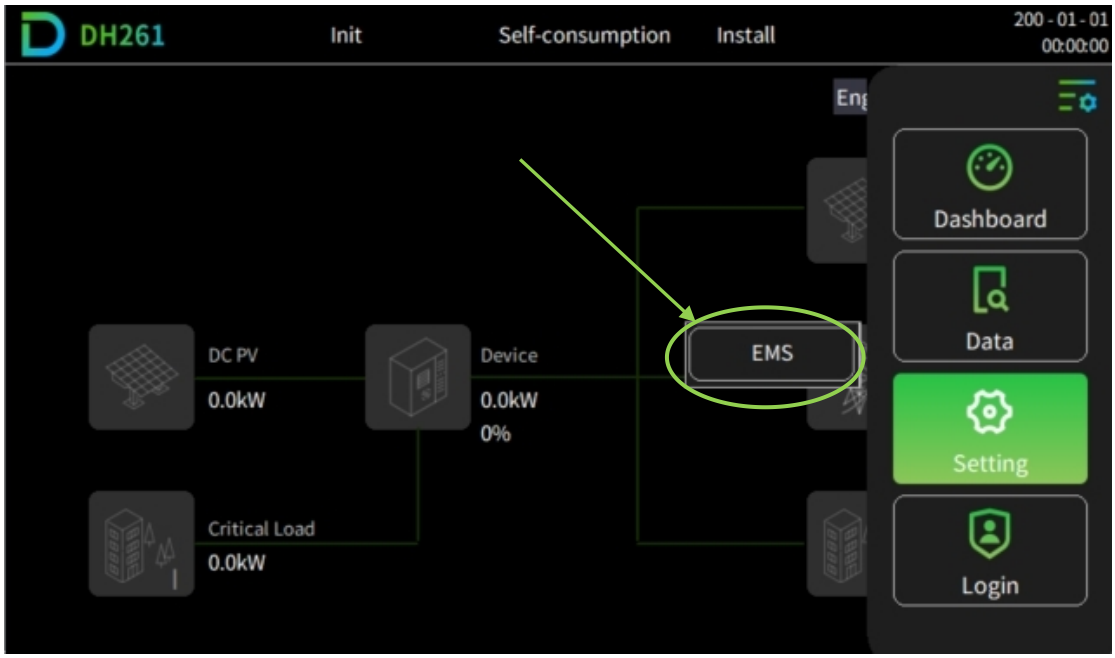
Step 1: Click the main menu icon on the upper right corner of the main interface;

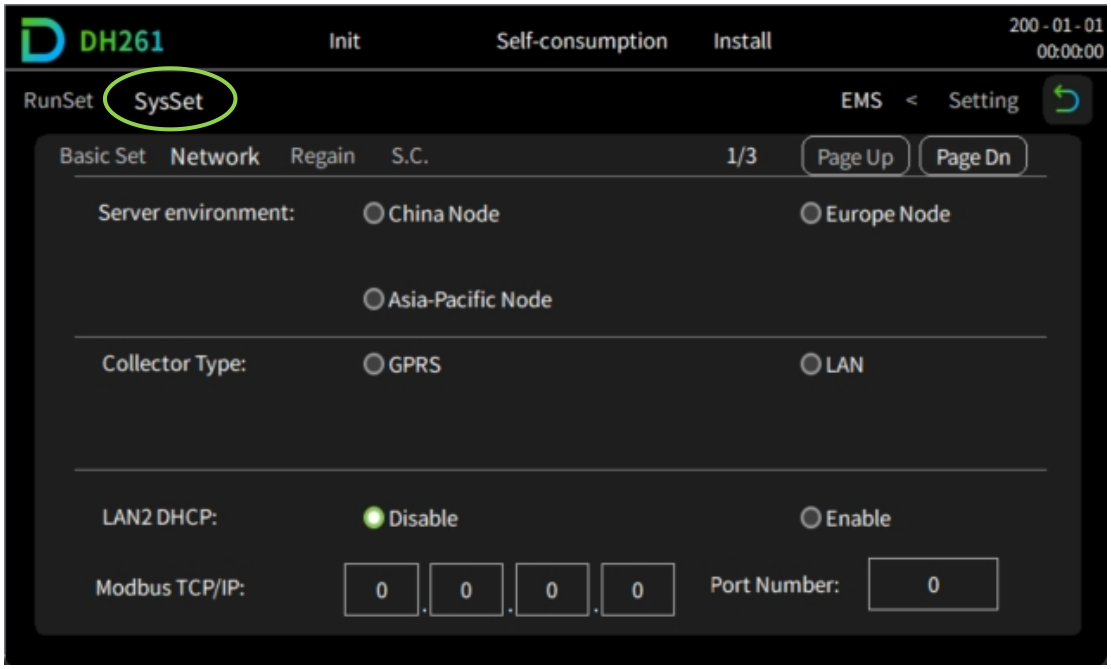
Step 2: Click "Setting" → "EMS";

Step 3: Click "SysSet" → "Network" to complete the cloud platform-related configuration (server environment, collector type) (If in remote mode, you can configure LAN2 DHCP settings), then click Page ;

Step 4: Configure local IP-related settings (Only available when the collector is LAN).

——END





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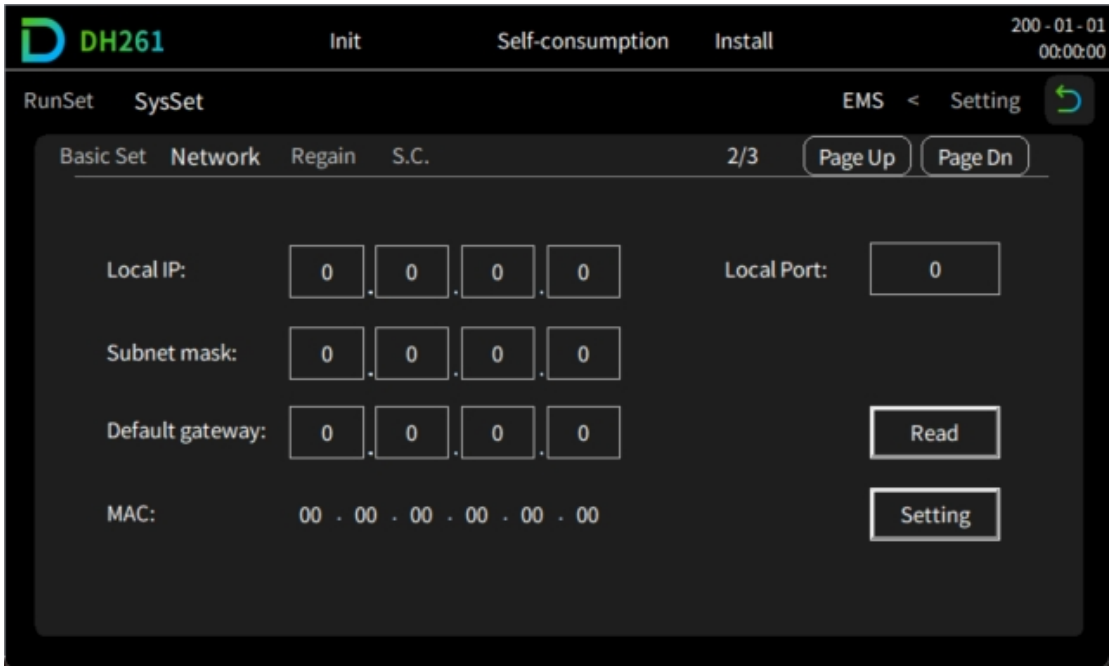


Figure 7-6 Network Setup Diagram (Total 3 pages)

7.4. Operating Settings Steps

7.4.1. System Parallel Enable

- Step 1: User login.

  * For specific steps, refer to “7.3.1 User Login”： Permission "Install" , password “1111”.

- Step 2: Go to the "RunSet" interface to configure settings.

  ① Click the main menu icon on the main screen;

  ② In the main menu bar, click "Settings";

  ③ In the "Settings" option bar, click the "EMS" option;

  ④ Click "Run Settings" in the navigation bar at the top left to enter the run settings interface.

  ⑤ On the automatic mode interface page "1/5", set [System Parallel] to "Enable".

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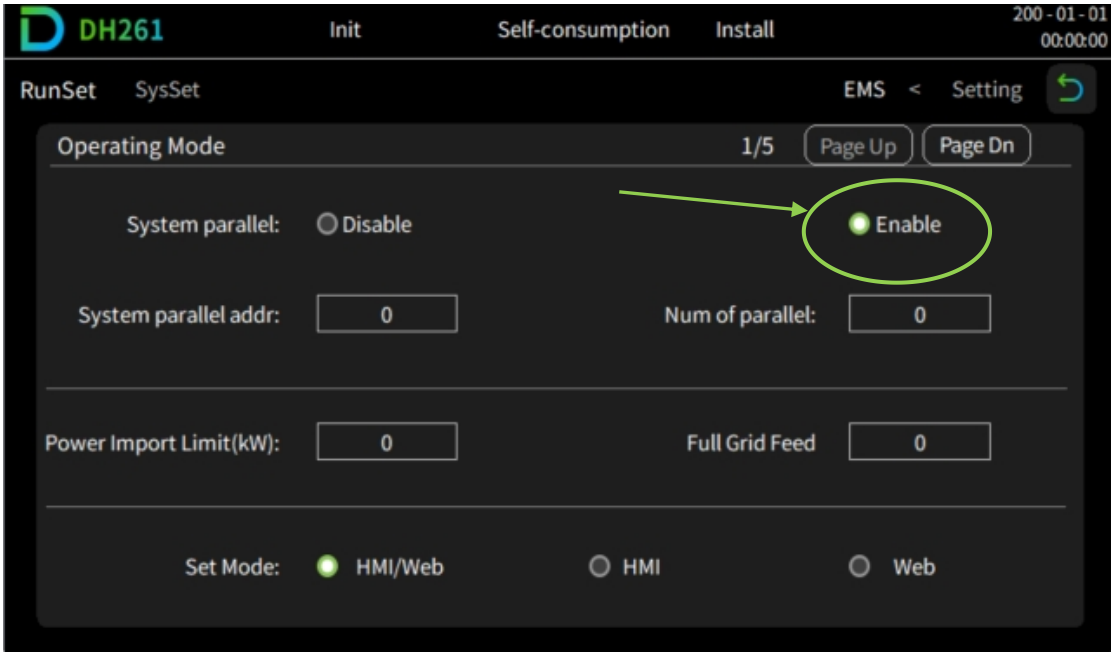


Figure 7-7 Automatic Mode Diagram

- Step 3: On the "Operation Mode" interface, set the parallel operation function and grid power intake settings.

  ① Set [System Parallel Enable]. If there is only one device, set it to "Disabled"; when multiple devices are operating in parallel, set it to “Enabled," and configure [System Parallel Address] and [System Parallel Quantity]. This allows limiting [Grid Power Absorption Limit] and [Grid Feed-in Power Limit].

  ② [Setting Method]: Select according to your needs. If "Web" is selected, follow up all remaining operations on the Dyness cloud platform; if "HMI/Web" or "HMI" is selected, please click Next.

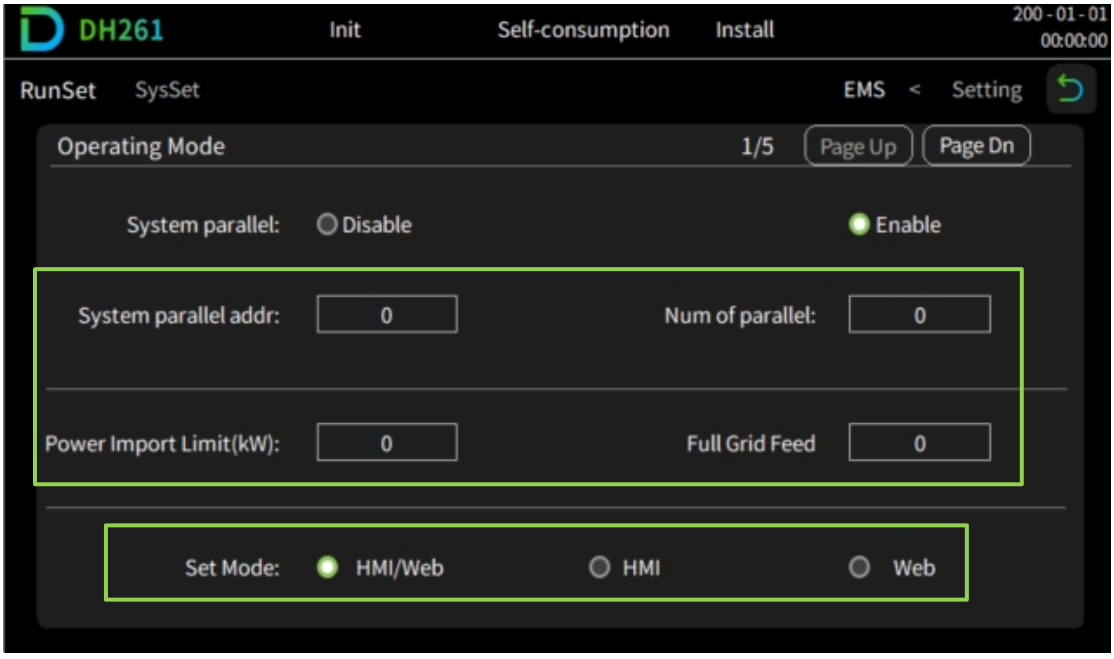


Figure 7-8 System Parallel & Operating Method Diagram

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- Step 4: In the "RunSet" interface, set Anti-reflux, anti-reverse strategy, SOC protection enable, and charging termination.

① On the page of operation mode "2/5", configure the functions of [Anti-reflux] and [Anti-reflux Strategy]. Select "Disable" or "Enable", as well as "Critical Anti-reflux" or "General Anti-reflux" according to requirements; meanwhile, set the anti-reflux power;

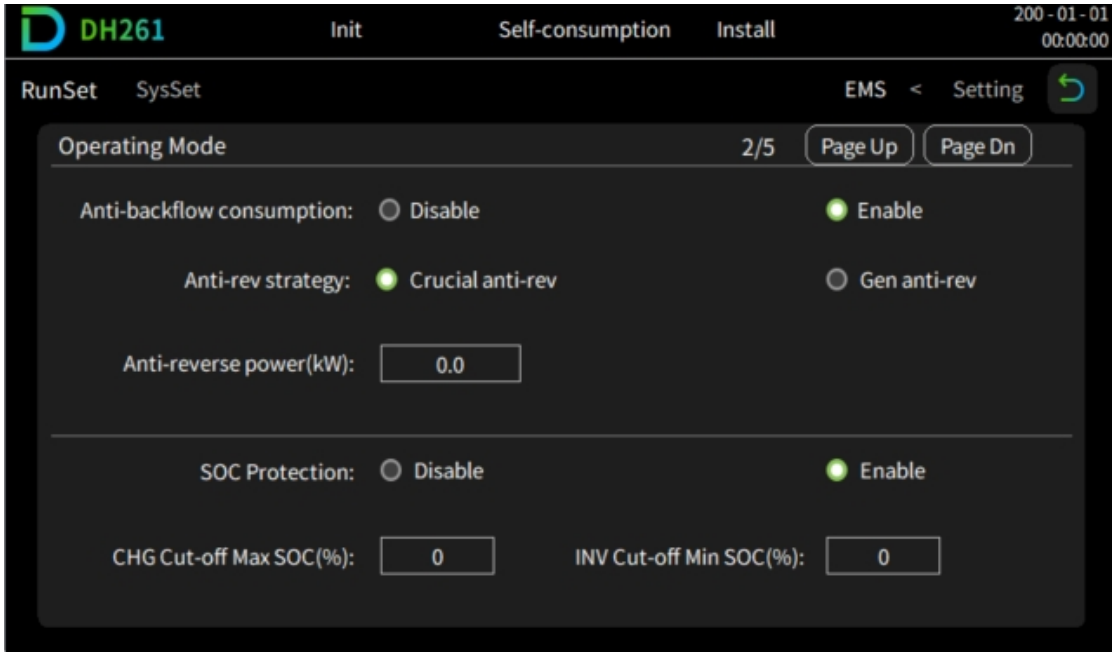
② On the page of operation mode "2/5", set the relevant parameters of [SOC Protection Enable] (including protection enable SOC, charge-discharge cut-off SOC, etc.), then click "Next Page";

③ On the page of operation mode "3/5", set the relevant data of [Demand Control] (Demand Control Enable, Demand Control Mode, Demand Control Hysteresis, Demand Control Power from January to December), then click "Next Page";

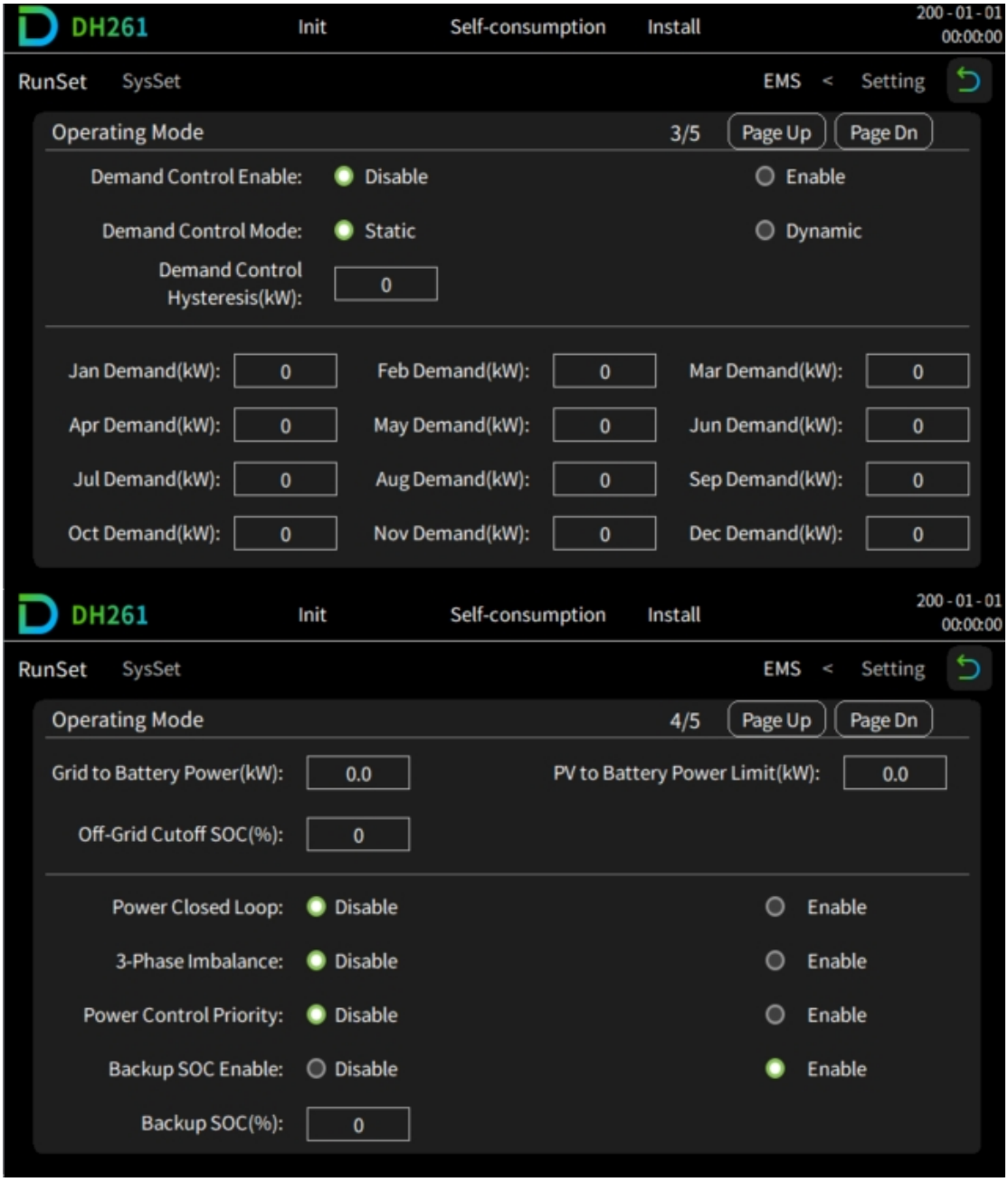
④ On the page of operation mode "4/5", configure the [Charging Power Limit] function. Select as required from "Grid-to-Battery Power Limit", "Self-owned PV-to-Battery Power Limit", and "Off-Grid Cut-off SOC". Options are also available for [Power Closed Loop], [Three-Phase Unbalance], [Power Control Priority], [Backup SOC Enable], and [Backup SOC (%)].

⑤ On the page of operation mode "5/5", set the [Operation Mode].

——END



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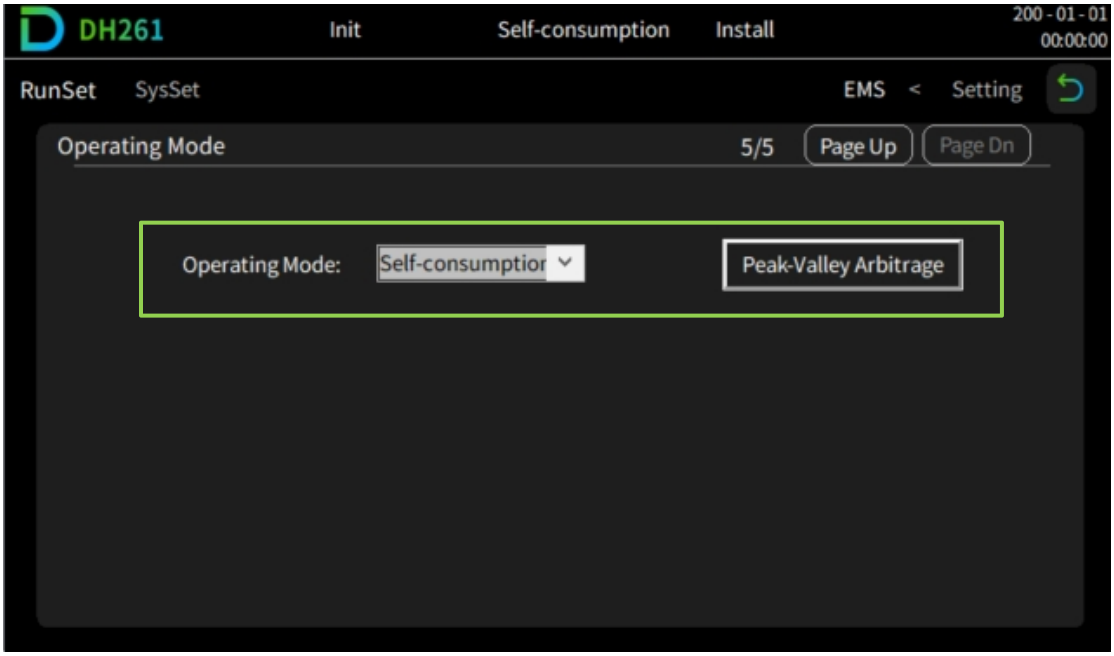


Figure 7-9 Schematic Diagram of Anti-reflux, Demand Control, SOC, Charging Equipment, and Operation Modes

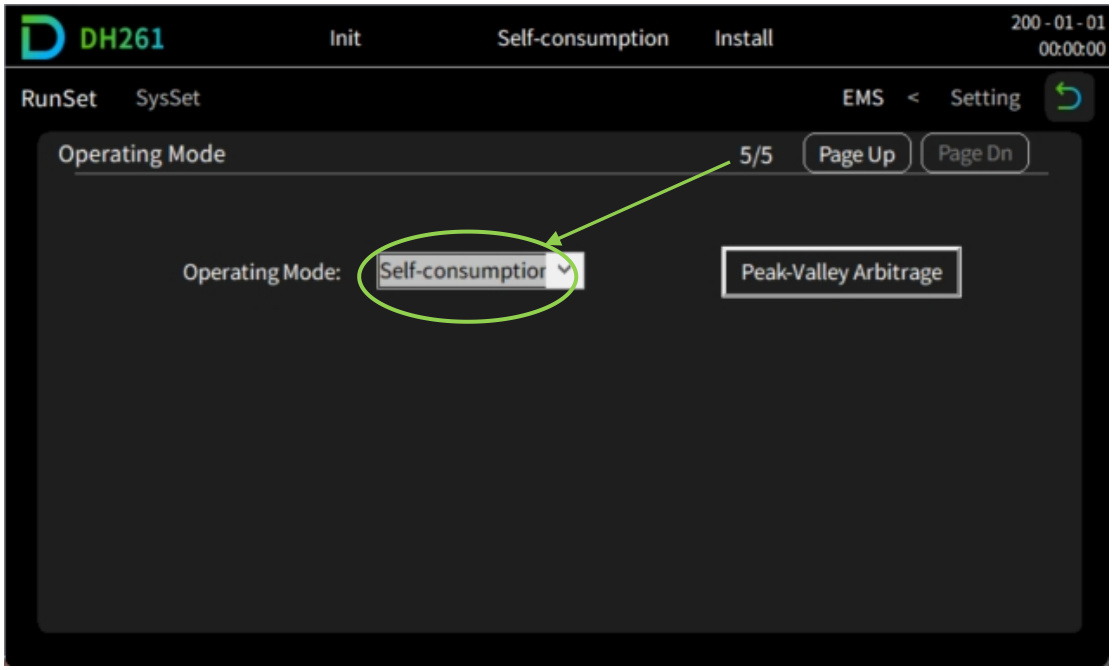
(Total 4 pages)

After completing the above settings, you can configure the [Operation Mode], which involves operations related to the system's operation strategy. The current system has seven operation strategies in total: Self-consumption for Own Use, Full Grid Feed-in, Peak Shaving and Valley Filling, Timed Charging and Discharging, Time-sharing Mode, Third-party EMS, and Third-party VPP. The configuration methods are described as follows:

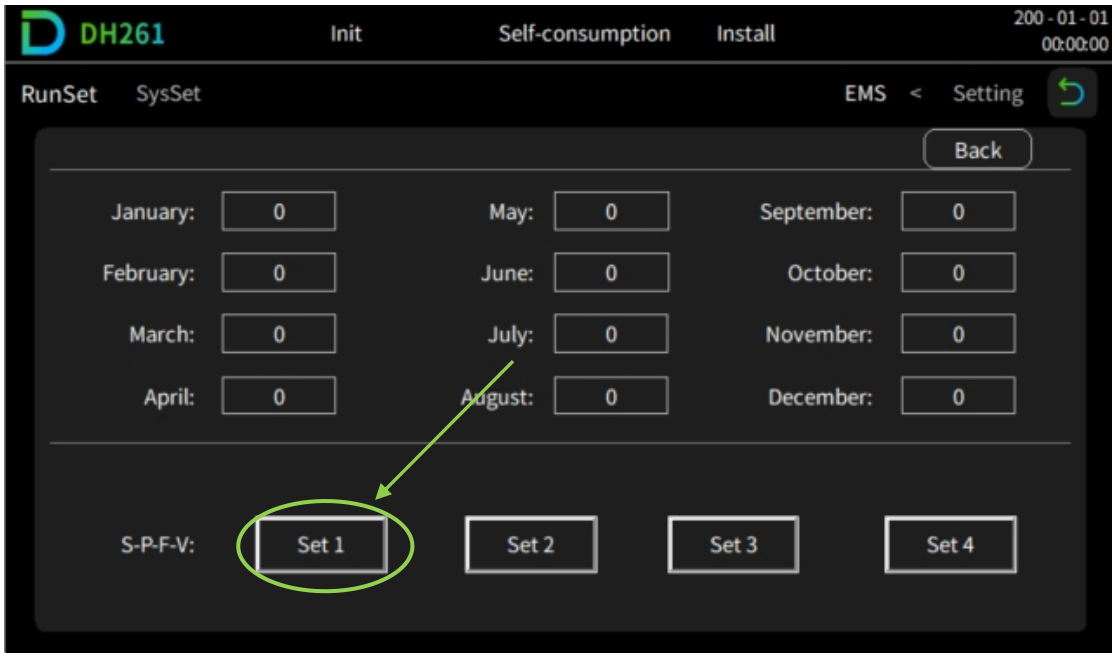
Self-Consumption

- Step 1: On the automatic mode "5/5" page, set the "Operation Mode" to "Self-generation and Self-consumption," and perform "Monthly Selection" according to project requirements (select time period tables for different months from January to December).

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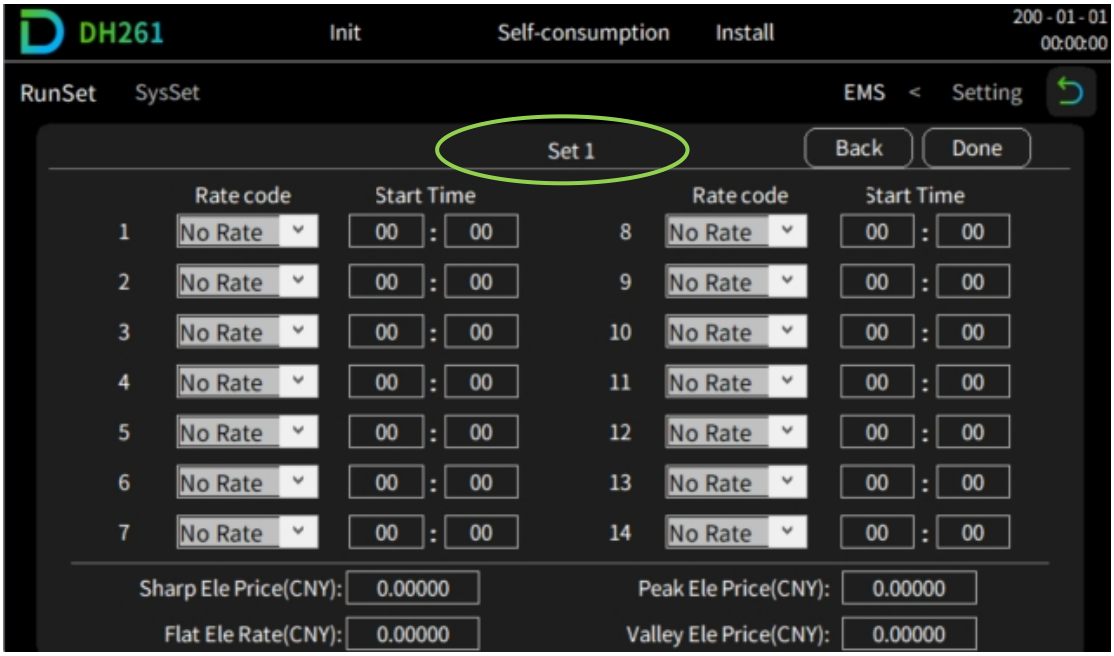


- Step 2: Select [Peak, On-peak, Flat, Valley], click "Set 1" to enter the next page; (taking "Set 1" as an example, a total of four electricity price schemes can be set)



- Step 3 " Set 1 allows customizing 14 starting time periods as required, configuring them in chronological order from top to bottom, and setting different tariff rates as well as corresponding peak, on-peak, mid-peak, and off-peak electricity prices for each starting time period.

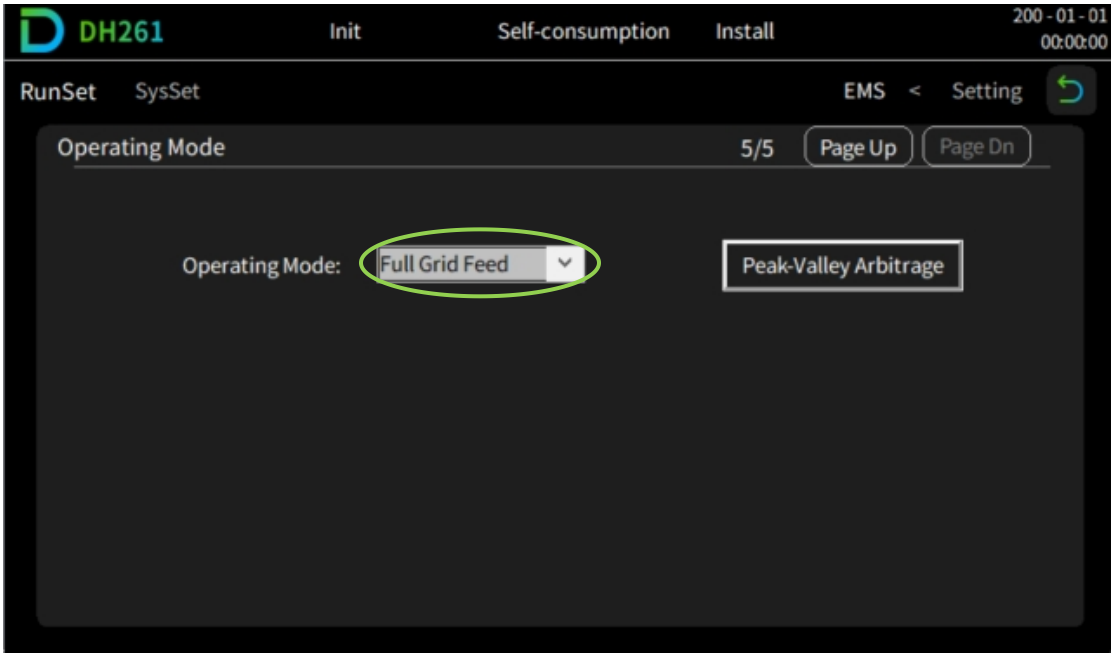
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——END

Full Grid Feed

- **Step 1:** Select "Full Grid Feed" in the operation mode.

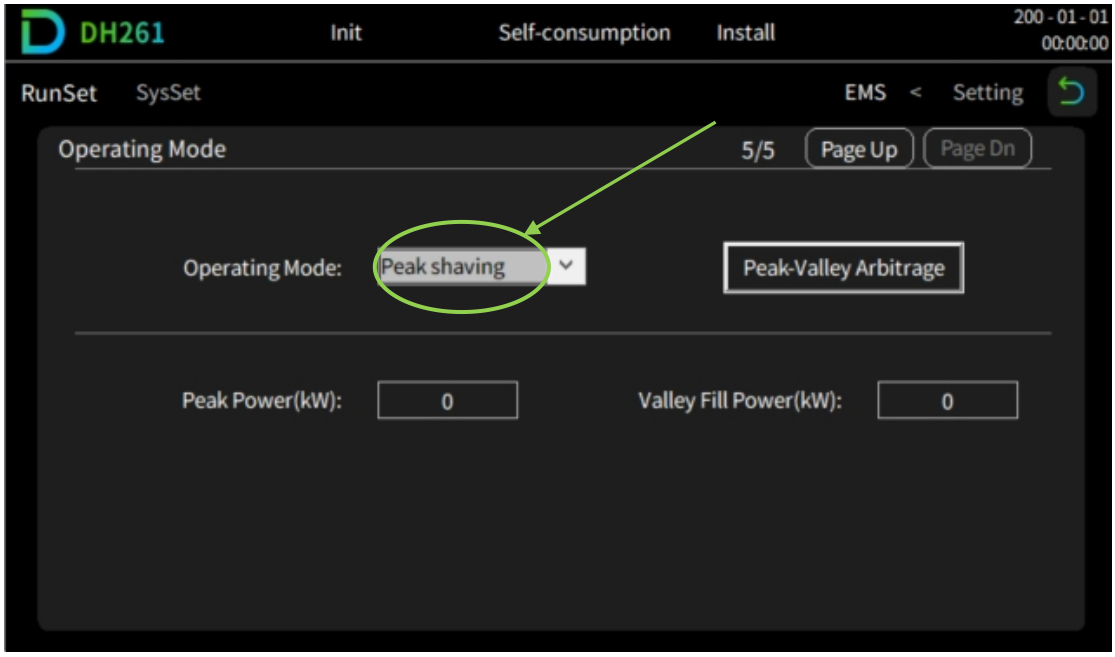


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Peak shaving

- Step 1: Set it to "peak shaving and valley filling" in the operation mode.

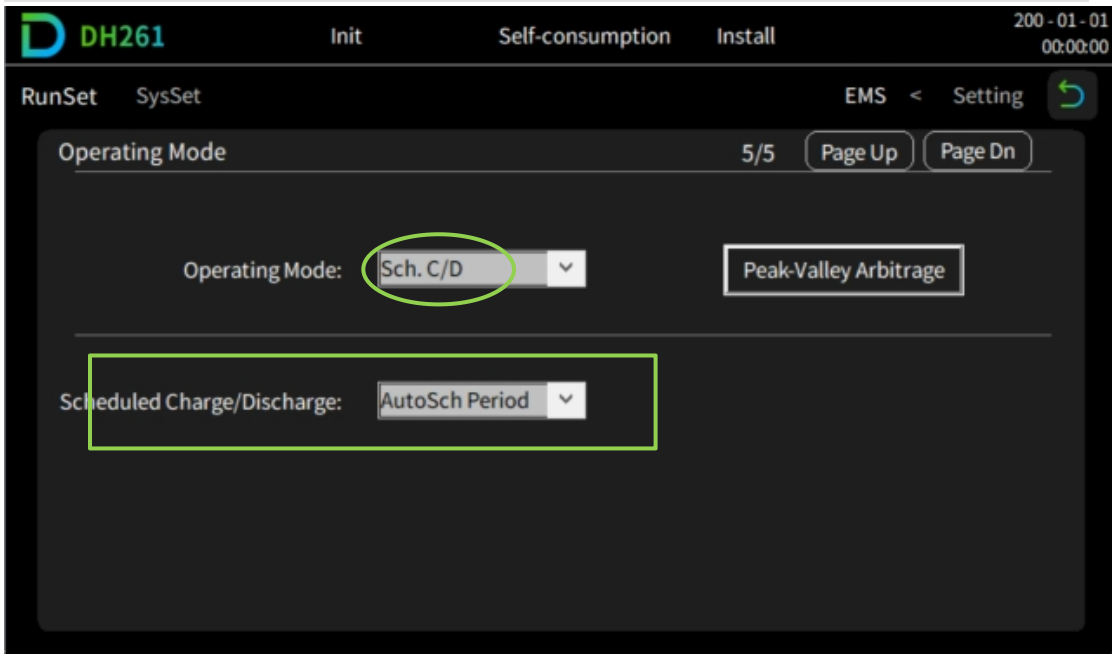


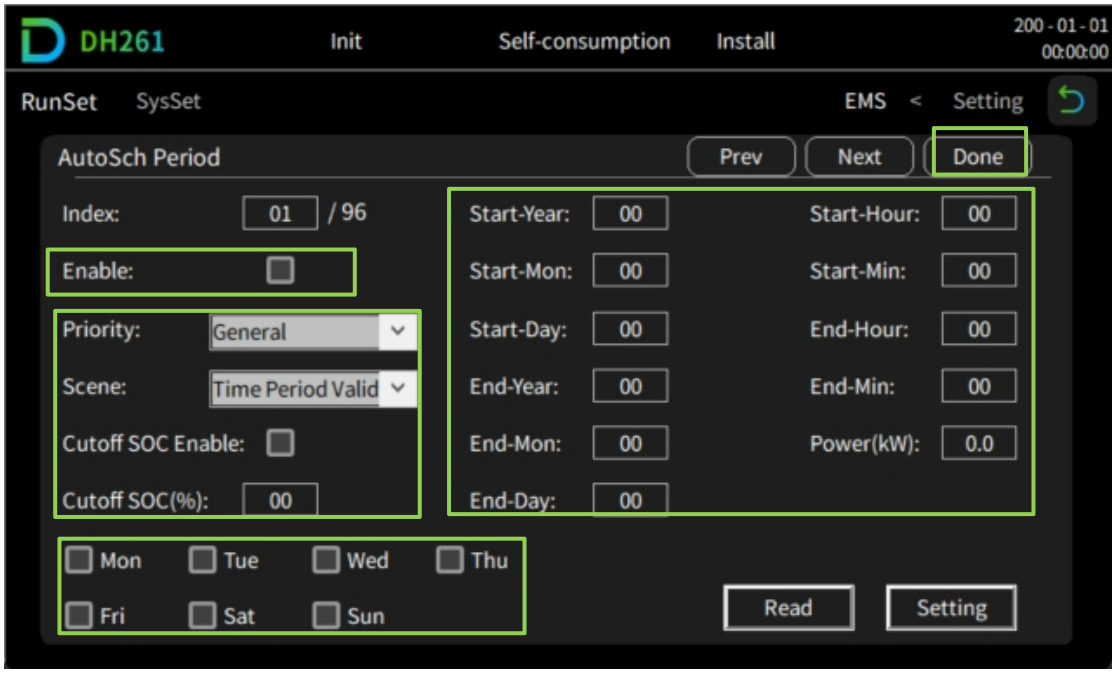
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Sch.C/D

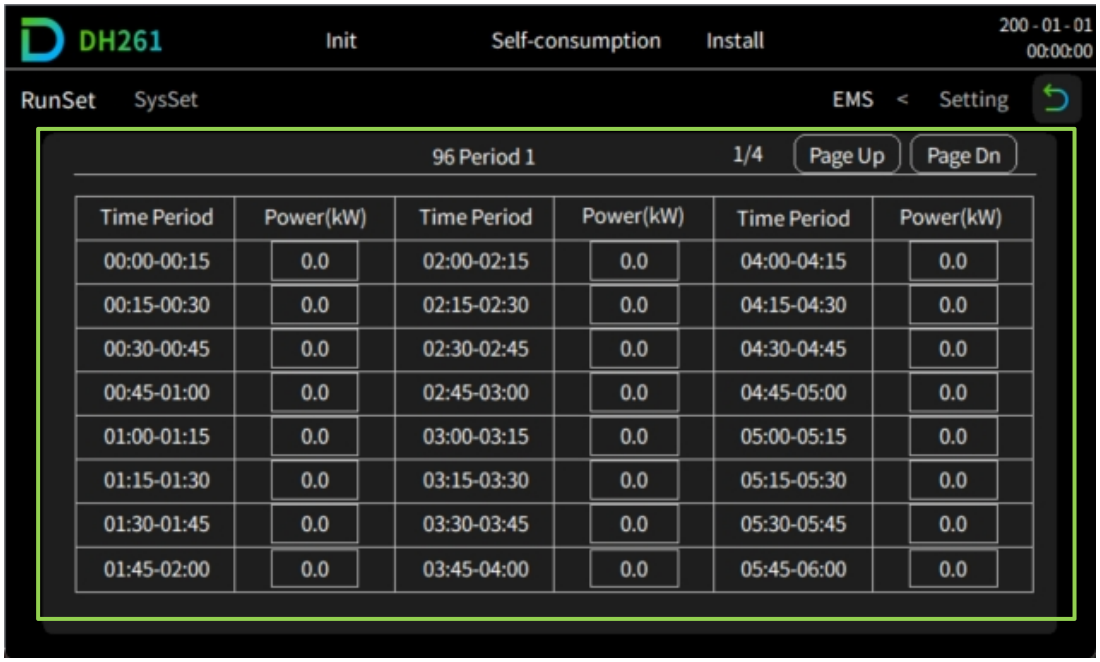
- Step 1: In operation mode, set it to "Timed Charge and Discharge" and select "Automatic Schedule Period".
- Step 2: Set it to [Automatic Schedule Period] and click "Next Page". Choose whether to enable the function, select "General" for priority, and select "Valid During Period" for the scenario. You may enable "End SOC Enable" and set "End SOC (%)". Select the specific start time and end time in the format of "Year-Month-Day-Hour-Minute", and you can set scheduled charging and discharging to run on any day from Monday to Sunday. Click "Finish" after completing the device settings.
- Step 3: In the operation mode, set it to "Timed Charge and Discharge", select "Dynamic Electricity Price", choose "Manual" for the dynamic electricity price control mode, and click "Next Page".
- Step 4: The power limit values for 96 time periods can be selected.

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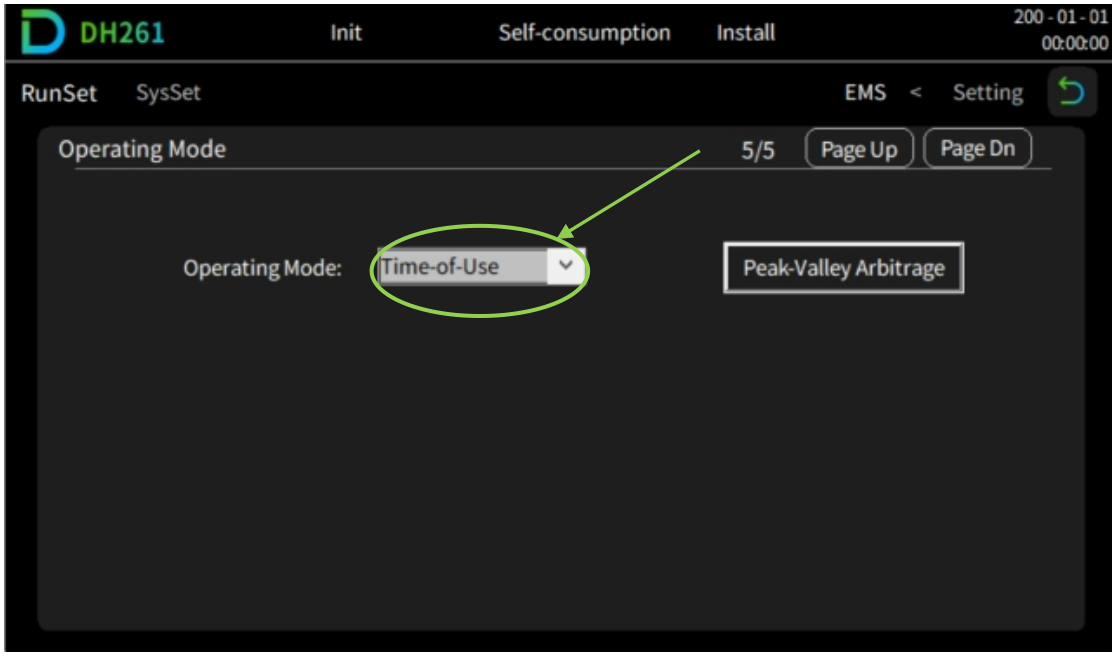


Time Period	Power(kW)	Time Period	Power(kW)	Time Period	Power(kW)
00:00-00:15	0.0	02:00-02:15	0.0	04:00-04:15	0.0
00:15-00:30	0.0	02:15-02:30	0.0	04:15-04:30	0.0
00:30-00:45	0.0	02:30-02:45	0.0	04:30-04:45	0.0
00:45-01:00	0.0	02:45-03:00	0.0	04:45-05:00	0.0
01:00-01:15	0.0	03:00-03:15	0.0	05:00-05:15	0.0
01:15-01:30	0.0	03:15-03:30	0.0	05:15-05:30	0.0
01:30-01:45	0.0	03:30-03:45	0.0	05:30-05:45	0.0
01:45-02:00	0.0	03:45-04:00	0.0	05:45-06:00	0.0

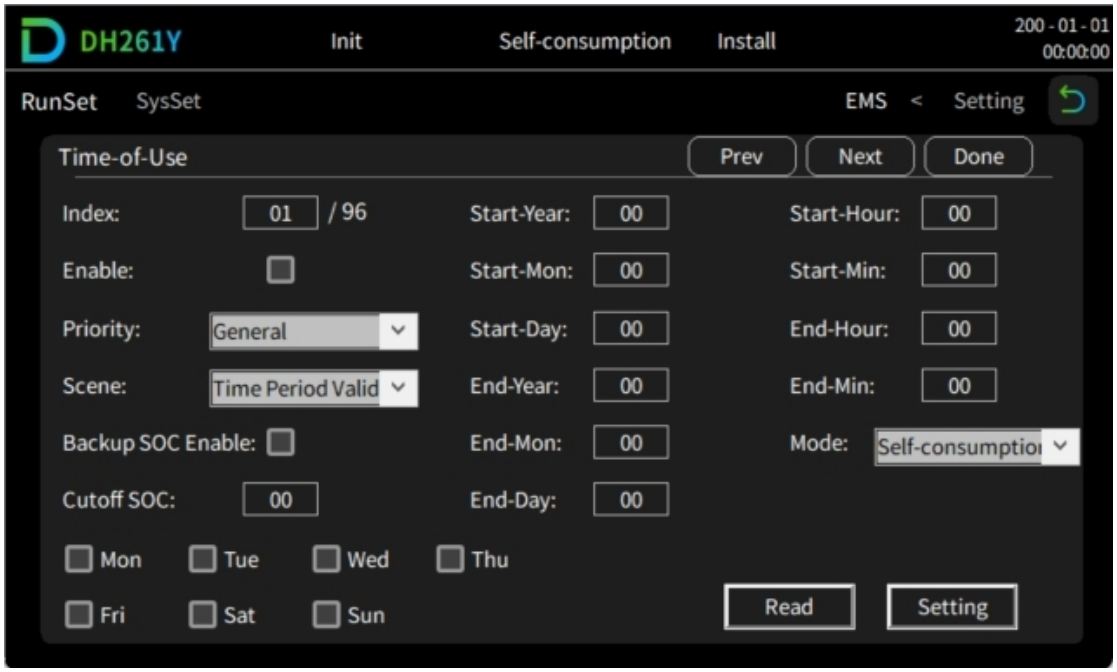
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Time-of-Use

- Step 1: Set to "Time-of-Use" in the operation mode.
- Step 2: Enable or disable in the "Time-sharing Mode", set the priority to "General", and select "Valid by Time Period" for the scenario. You can enable "Cut-off SOC Enable" and set "Cut-off SOC (%)". Select the specific start time and end time in the format of "Year-Month-Day-Hour-Minute", and choose any day from Monday to Sunday to execute "Self-generation and Self-consumption". Click "Finish" after completing device configuration.



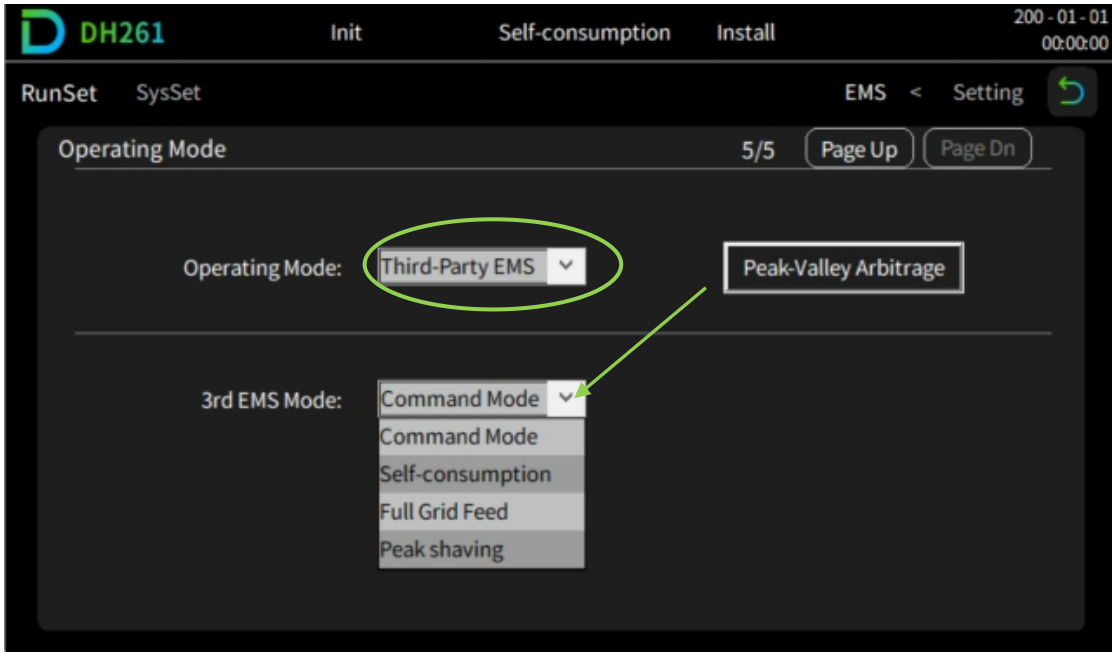
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Third-party EMS

- Step 1: Set to "Third-party EMS" in the operation mode.
- Step 2: Under the "Third-party EMS" mode, select one of the four third-party EMS Control operation modes: "Command Mode", "Self-consumption", "Full Grid Feed", and "Peak Shaving". For detailed operating procedures, refer to the previous operation mode steps.

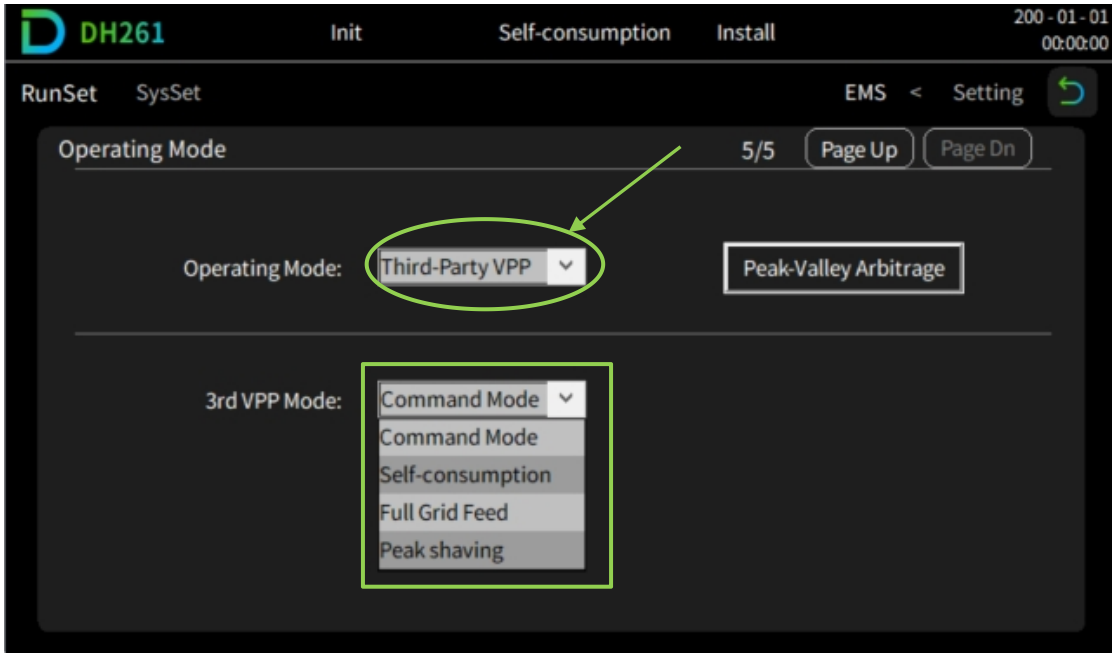


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Third-party VPP

- Step 1: Set the operation mode to "Third-party VPP".
- Step 2: Under the "Tripartite VPP" mode, select four third-party VPP control and operation modes: "Command Mode", "Self-consumption", "Full Grid Feed", and "Peak Shaving". For detailed operation procedures, refer to the previous operation mode steps.



——END

7.4.2. Remote Mode

- Step 1: User login.

  * For specific steps, refer to “7.3.1 User Login”： Permission "Install"，password “1111”.

- Step 2: Go to the "Run Settings" interface to configure settings.

  ① Click the main menu icon on the main screen;

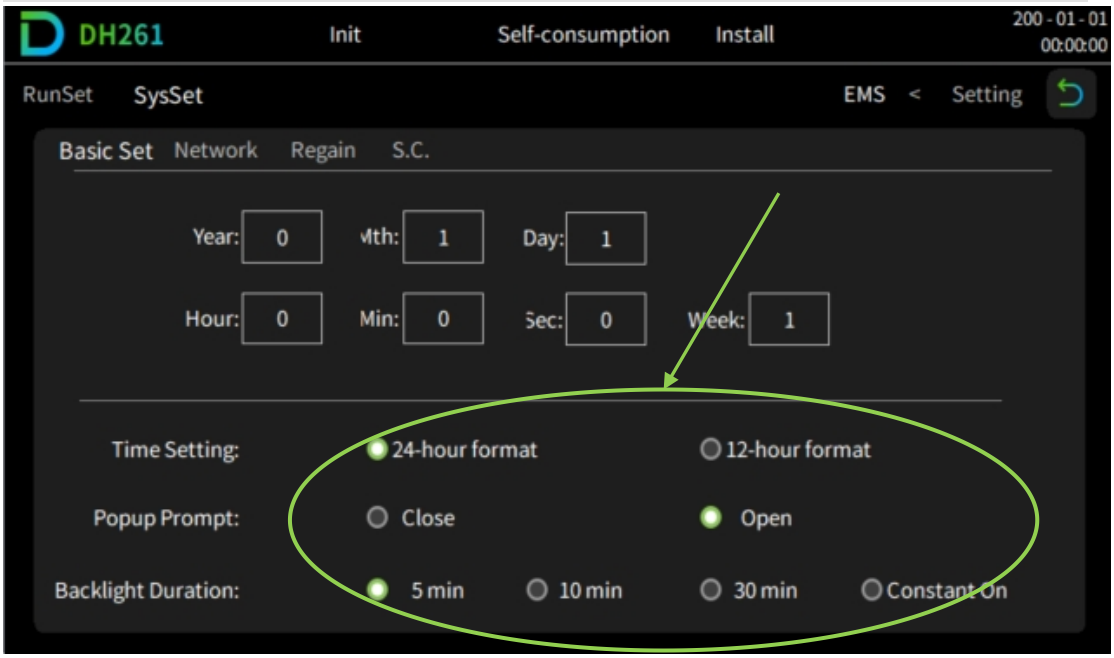
  ② In the main menu bar, click "Setting";

  ③ In the "Setting" option bar, click the "EMS" option;

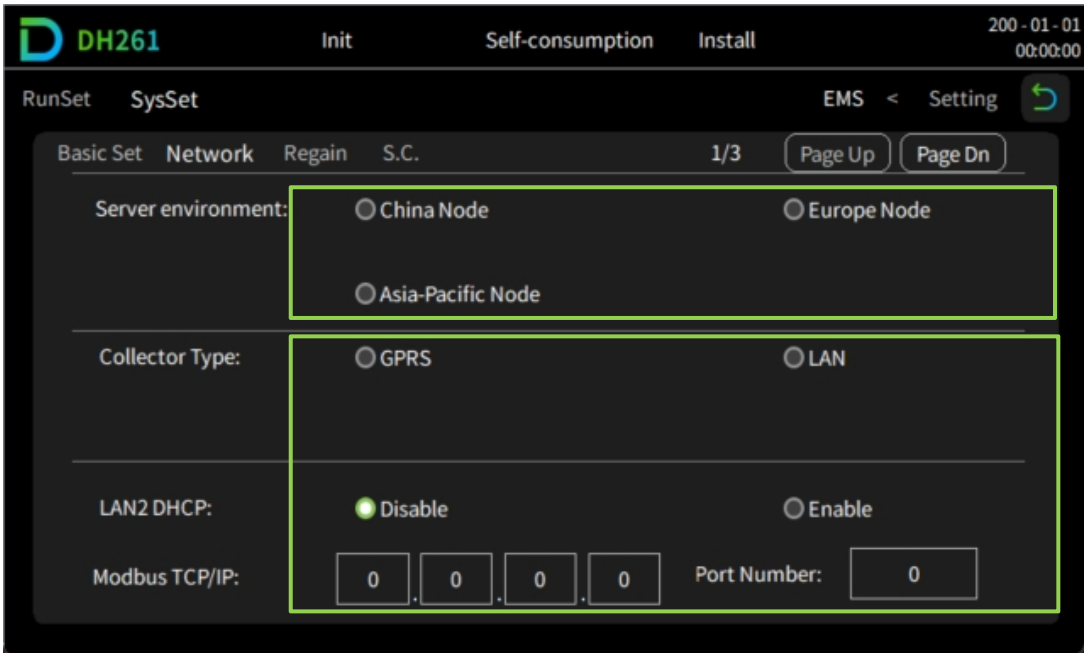
  ④ Click "SysSet" in the top-left navigation bar to enter the basic settings interface.

Basic function settings for the HMI screen can be made on this interface; see the operation interface for details.

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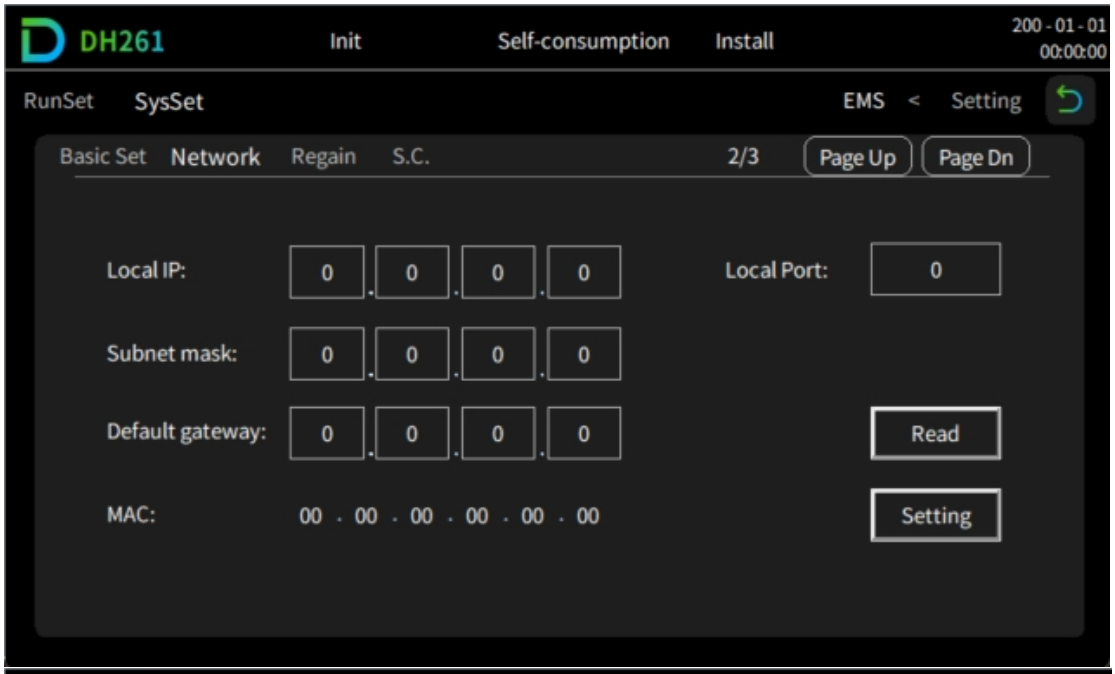


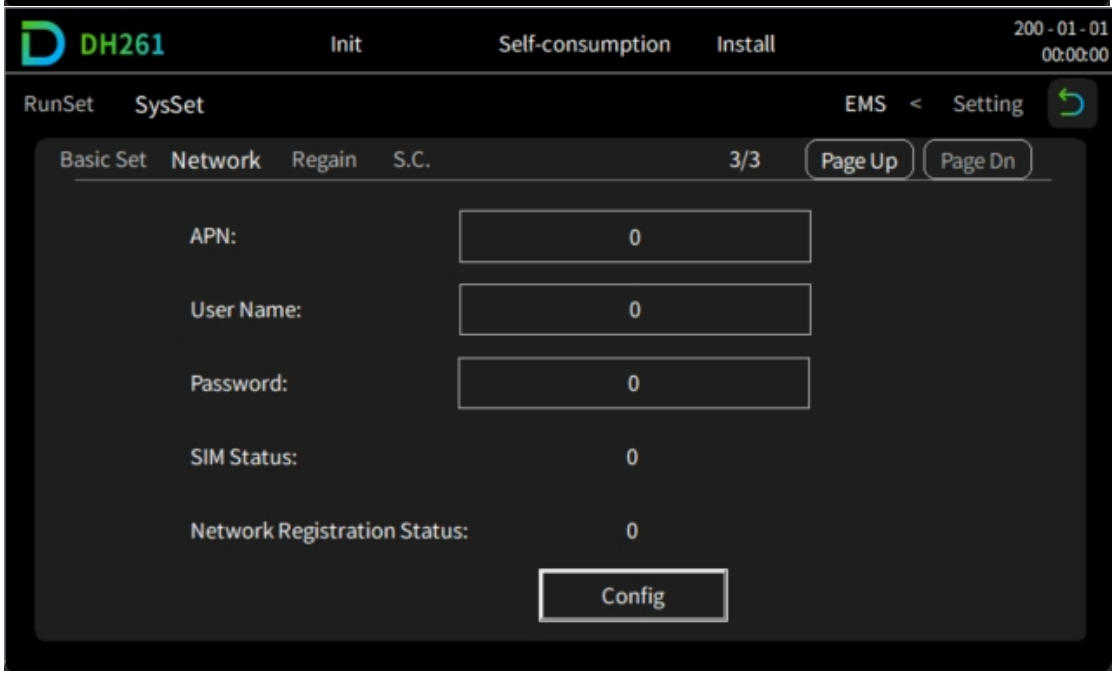
- Step 3: Go to the "Run Settings" interface to configure settings.
  Configure [Network Settings]. On page "1/3", you can select from three server environment types: "China Site", "Europe Site", and "Asia-Pacific Site". The collector type can be chosen as "GRRS" or "LAN". For LAN2 DHCP, you may select "Disable" or "Enable". At the bottom, there is an input field for the "Modbus TCP/IP" address as well as the "port number.



Proceed to the next page "2/3", where you can enter the Local IP address, Subnet Mask, Default Gateway, Local Port Number, and MAC address.
Proceed to the next page "3/3", which allows you to enter the APN code, set the Username and Password, and access functions such as checking the SIM card status and viewing the network registration status.

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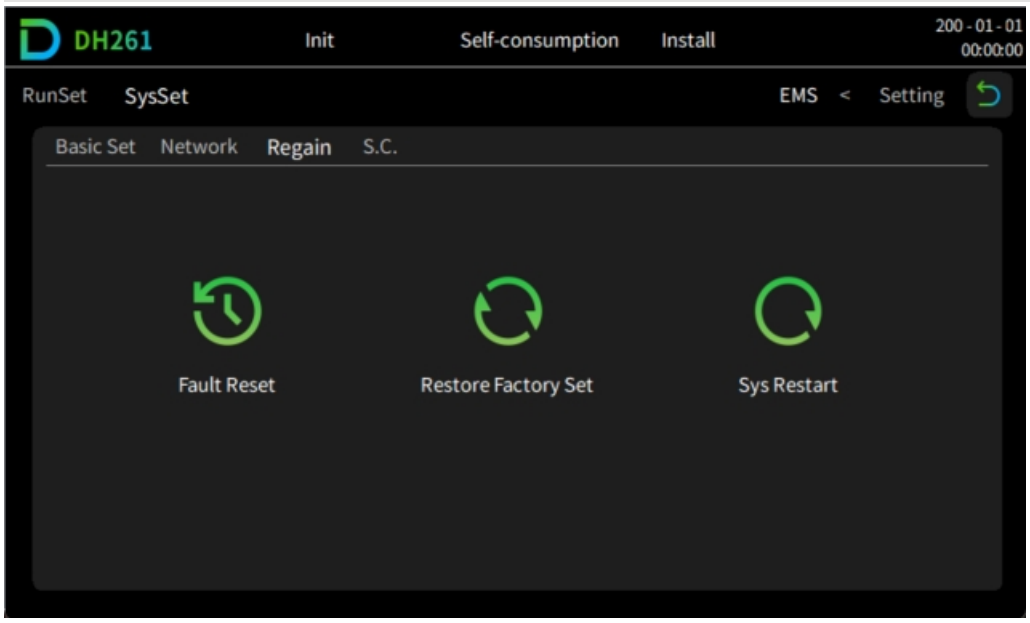




- Step 4: Enter the "Restore Factory Settings" interface to configure.

Enter the "Restore Factory Settings" option by clicking on it in the "System Settings Interface," where you can perform three reset operations: "Fault Reset," "Restore Factory Defaults," and "System Restart."

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7.5. Cloud Platform

The current cloud platform supports two login methods: app and web. The login navigation is as follows:

APP

Domestic

Download on the App Store

Android

Overseas

Download on the App Store

GET IT ON Google Play

Scan the QR code to log in to the cloud platform app.

Web

China Station: https://ems.dyness.cn

Europe Station: https://ems.dyness.com

Asia-Pacific Station: https://apacems.dyness.com

The above station covers most countries around the world. If you need to obtain the correspondence between sites and countries, please contact Dyness.

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8. Fault Description

If the solution provided below still does not solve the problem, please contact Dyness.

Table 8-1 Fault Description and Solution

Fault Phenomenon	Solution
Power light off	• Check that each circuit breaker is closed.
Running light off	• Check if EMS is in running state.
Alarm light on	• Check whether there is any alarm through the screen or the web, whether it is caused by improper operation. If not, please contact Dyness.
Show access alarm	• Check whether the door is closed.
Show flood alarm	• Check whether the system is flooded, or whether the water sensor line is disconnected or damaged.
Show emergency stop alarm	• Check whether the emergency stop switch is in the released state.
Show SPD alarm	• Check whether the surge protector is damaged and whether the fault light is on. If damaged, contact the supplier for replacement.
Show gas detector alarm	• Stop using immediately and contact the supplier.
Show temperature detector alarm	• Stop using immediately and contact the supplier.
Show smoke detector alarm	• Stop using immediately and contact the supplier.
Show other alarm	• Need to contact the manufacturer for supplier.
Abnormal anti-backflow	• Check whether the anti-backflow meter is set correctly and whether the meter is correctly installed; • Check whether the PE cable of the EMS is grounded; • If the fault information still exists, please contact the supplier.
Abnormal communication between EMS and BMS	• Shutdown to check if the communication cable is firmly connected and correct; • Restart the EMS and check if it functions normally; • If the error message still exists, please contact the supplier.
Abnormal communication between EMS and fire protection module	• Shutdown to check if the communication cable is firmly connected and correct; • Restart the EMS and check if it functions normally; • If the error message still exists, please contact the supplier.
Abnormal communication between EMS and PCS	• Shutdown to check if the communication cable is firmly connected and correct; • Restart the EMS and check if it functions normally; • If the error message still exists, please contact the supplier.

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Abnormal communication between EMS and DCDC	• Shutdown to check if the communication cable is firmly connected and correct; • Restart the EMS and check if it functions normally; • If the error message still exists, please contact the supplier.
Abnormal communication between EMS and meter	• Shutdown to check if the communication cable is firmly connected and correct; • Restart the EMS and check if it functions normally; • If the error message still exists, please contact the supplier.
Abnormal communication between EMS and air conditioner	• Shutdown to check if the communication cable is firmly connected and correct; • Restart the EMS and check if it functions normally; • If the error message still exists, please contact the supplier.
Abnormal communication between EMS and HMI	• Check the meter cables after shutdown; • If the error message still exists, please contact the supplier.
SD card detect abnormality	• Check if the SD card is normal; if not, please replace the SD card. • If the error message still exists, please contact the supplier.
Network abnormality - (default blocked)	• Check the 4G/Wi-Fi/LAN antenna; • If the error message still exists, please contact the supplier.
EMS power loss saving abnormality	• If the error message still exists, please contact the supplier.
EMS external Flash abnormality	• If the error message still exists, please contact the supplier.
System version inconsistency abnormality	• Restart PCS and check if it is normal; • If the error message still exists, please contact the supplier.
Parallel communication loss	• Restart PCS and check if it is normal; • If the error message still exists, please contact the supplier.
Parallel host loss	• Restart PCS and check if it is normal; • If the error message still exists, please contact the supplier.
Parallel grid input inconsistency	• If the error message still exists, please contact the supplier.
Parallel input phase sequence error	• If the error message still exists, please contact the supplier.
Parallel output phase deficiency	• If the error message still exists, please contact the supplier.
Incompatible software versions prevent parallel operation	• If the error message still exists, please contact the supplier.

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Inconsistent capacities prevent parallel operation	• If the error message still exists, please contact the supplier.

9. System Maintenance

WARNING

- Operational maintenance work must comply with local laws and regulations and the precautions in this manual.
- System maintenance work must be performed by professionals with electrical and power engineering knowledge and relevant qualifications.
- When performing system maintenance, wait until the outdoor cabinet's internal equipment is completely powered down before beginning inspection work. If any non-conformities are found during inspection, correct them immediately.

The system needs to be checked regularly. Here are some things to check and how often to do it. For more details, check out the *Operating and Maintenance Manual*.

Table 9-1 System maintenance checklist

Items	Checklist	Frequency
Cabinet exterior	Check if there are any flammable materials on the ESS cabinet;	Once/year
	Check if the ESS cabinet and expansion bolts are secure and free from rust;	
	Check if there is any damage, peeling paint, and oxidation on the ESS cabinet casing;	
	Check if the cabinet door locks can open smoothly;	
	Check if the sealing strips are securely fixed.	
System status	Check if the ESS cabinet and internal equipment are damaged or deformed;	Once/year
	Check if the warning signs and labels are clear and visible. Replace them if necessary;	
	Check if there are any loose or missing screws inside the ESS cabinet;	
	Check if the cable shielding layer is in good contact with the insulation sleeve;	
	Check if the grounding copper bar is securely fixed in place.	
	Check if there are any oxidation or rust inside the ESS cabinet;	
	Check if the ESS cabinet and internal equipment are damaged or deformed.	
Wiring and cable arrangement	Check if all the inlet/outlet of the ESS cabinet are sealed properly;	Once/year
	Check if there are any water leakage inside the ESS	

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	cabinet;	
	Check if the power cables are loose. Tighten them according to the previously specified torque;	
	Check if there are any damage to power cables and control cables, especially check for cuts in the insulation where they contact metal surfaces.	
	Check if the insulation wrapping of cable terminals is falling off;	
	Check if the PE cable connection is correct, the grounding resistance value should not exceed 4 Ω;	
	Check if the equipotential connections inside the ESS cabinet are correct.	
System cleanliness	Check if the inlet/outlet of the ESS cabinet are blocked. Please clean them if needed;	Once/ half year
	Check if the humidity inside the ESS cabinet is within the normal range. Please clean them if needed;	
	check if there are foreign objects, dust, dirt, and condensation inside the ESS cabinet;	
	Check if there is condensation inside the ESS cabinet regularly: Once a year for areas with low relative humidity; Once every half year for areas with medium relative humidity. Once every one to three months for areas with high relative humidity.	
System function	Check if there are abnormal noises inside the ESS cabinet during operation;	Once/two years
	Check if the temperature is too high inside the ESS cabinet;	
	Check if the system operates normally for startup and shutdown.	
Fan	Check the operation status of the fan;	Once/year
	Check if the fan is blocked;	
	Check if there are abnormal noises during fan operation.	
Air conditioner	Check the operation status of the air conditioner;	Once/year
	Check if the air conditioner is blocked;	
	Check if there are abnormal noises during air conditioner operation.	
Safety function	Check the stop function of EPO and screen, and simulate shutdown for testing;	Once/half year ~ year
	Check the warning signs and other labels. Please replace them if there is any damage or blur.	
Device maintenance	Perform a regular inspection for rust condition of all metal components (once every half year);	Once/half year ~ year
	Annual inspection of the contactor (auxiliary switch and micro-switch) to ensure that the product runs well;	
	Check the operating parameters (especially voltage and	

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	insulation parameters).	
SOC Calibration	Complete the calibration operation through full charge and full discharge cycles.	Once/month

10. Quality Assurance

Warranty period: Please refer to *the Warranty Agreement.*

Service within the warranty period: For Dyness ESS products that fail within the warranty period, we will be responsible for handling and providing proper replacement or repair solutions, offering free services or replacement of failure products. We will require valid invoices and receipts of purchase for warranty. Meanwhile, the Dyness trademark should be visible to ensure the validity of the assurance.

We reserve the right not to provide warranty in the following situations:

- The ESS products exceed the free warranty period;
- Improper installation, modification, or usage;
- Operation under harsh environments beyond those specified in this document or the "Warranty Agreement" or “Technical Agreement," or damage caused by abnormal natural environmental factors;
- Damage or failure caused by installation, modification, and disassembly by unauthorized agencies or individuals;
- Damage or failure caused by the use of non-standard products or unauthorized components and software.

For failures caused by the above situations, Dyness could provide paid maintenance services if the customer requires.

If you have any problems with this product, please contact us. In order to solve your problem more quickly, please provide the following information:

- Original purchase receipt or invoice;
- Contact information, including name, phone number, email address, and shipping address.
- Product information, including product model, product serial number, installation date and location, fault date and fault description, etc.

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11. Appendix

Please check if the following checklist has been completed before the product runs.

Table 11-1 Checklist before operation

Items	Checklist	Confirm
1	Check if the appearance is damaged and if the internal equipment is intact;	☐
2	Check if the assembly is firm;	☐
3	Check if the logo and labels of the ESS cabinet and components are clear or damaged;	☐
4	Check if the grid AC cables are connected in the correct phase sequence;	☐
5	Check if the PV cables are connected in the correct phase sequence;	
6	Check if the communication cable connection is complete;	☐
7	Check if there are any faults in the PE cable;	☐
8	Check if the liquid cooling pipes are well connected and check if there are any leaks;	☐
9	Check if the meter reads correctly;	☐
10	Check if all the connection points are correct and have good contact;	☐
11	Check if there are no abnormal situations with manual components;	☐
12	Check if the circuit breakers are functioning normally;	☐
13	Check if all the buttons and related indicators are functioning normally;	☐
14	Check if the power indicator is normal;	☐
15	Check if the running indicator is normal;	☐
16	Check if the fan and air conditioner are running well and there are no abnormal sounds;	
17	Check if the HMI screen is normal and there are no error messages;	☐
18	Check if there are any tools or components left inside the ESS cabinet;	☐
19	Check if the door of the ESS cabinet can open and close smoothly;	☐
20	Check that the air conditioner drain pipe is smooth and free of kinks (the end of the pipe should not touch the ground).	☐

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