



DH100F

USER MANUAL

EnerCore
Outdoor PV+ESS
All-in one Cabinet

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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 contract 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	2024.05.31	First publication
1.1	2024.09.06	Correction of figure, and overall update
1.2	2025.08.05	Freeze 1-channel MPPT model, add BDU interface definition, and optimize overall product description content.
1.3	2025.08.22	Symbolic marks, product descriptions, packaging marks updated; add cloud platform address; overall framework adjustments
1.4	2025.11.30	Update the appearance images

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 mainly introduces the safety precautions, functions and specifications, delivery and storage, installation and wiring, power-on/off process, HMI operation, maintenance and quality assurance of 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 operation. 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 the 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 resulting in personal safety issues.
	Indicate an electrical hazard, all external power connections must be disconnected before maintenance and operation.
	Indicate that there is 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, need professional recycling, can not be put into the trash can
	Instruction (User Manual) mark
	The cabinet may still be live within five minutes after power-off. All operations must be initiated at least five minutes after the cabinet is powered off.

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

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, 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;

2.3. Environmental Safety Requirements

- Do not install and use the product in environments with temperature below -20°C or above 50°C;
- 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 3000m, and it should be derated when above 2000m;
- 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.



Battery protection safety

Please ensure that during installation, 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,

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 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

- Servicing of batteries should be performed or supervised by personnel knowledgeable about batteries and the required precautions.
- When replacing batteries, replace with the same type and number of batteries or battery packs.
- General instructions regarding removal and installation of batteries.
 - a) CAUTION: Do not dispose of batteries in a fire. The batteries may explode.
 - b) CAUTION: Do not open or damage batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.
 - c) CAUTION: A battery can present a risk of electrical shock and high short-circuit current.
- The following precautions should be observed when working on batteries:
 - a) Remove watches, rings, or other metal objects.
 - b) Use tools with insulated handles.
 - c) Wear rubber gloves and boots.
 - d) Do not lay tools or metal parts on top of batteries.
 - e) Disconnect charging source prior to connecting or disconnecting battery terminals.
 - f) Determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply 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 as regular waste. Some components inside the product can be recycled and reused. Improper disposal of certain components may cause environmental pollution. Please contact qualified local professional recycling organization for proper disposal of the product and internal components.

3. Product Description

3.1. Product Overview

The product is an C&I outdoor air-cooling ESS+PV all-in-one cabinet, the system storage capacity is 71/86/100 kWh, and the rated AC output power is 35/40/50 kW. System integration includes PACK, BDU (with built-in BMS), PCS, DC/DC, MPPT(optional), distribution modules (with built-in EMS), security & fire protection systems, air conditioning systems, etc. Which could provide users with peak-shaving, capacity and demand reduction, dynamic expansion, demand response and other functions. It can be widely used in charging stations, commercial buildings, manufacturing industry and other small industrial and commercial scenarios.

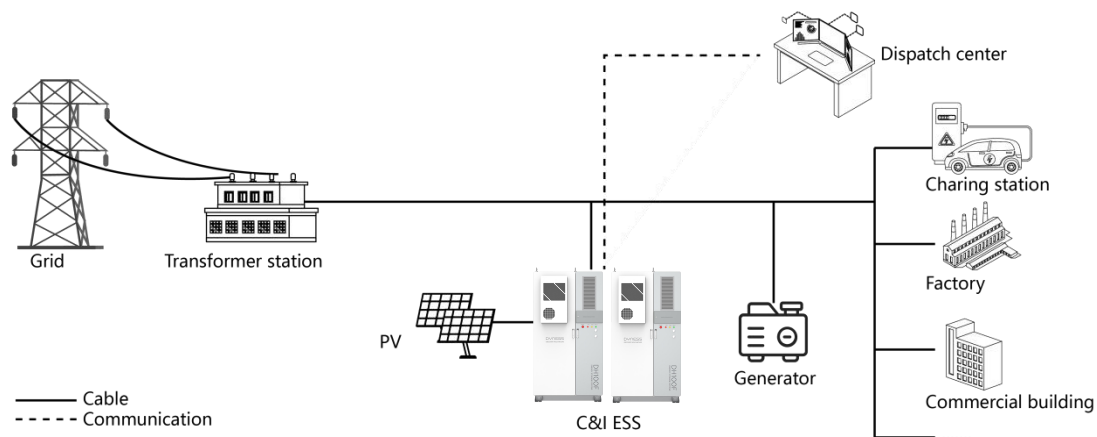


Figure 3-1 System Application

The product supports PV access, generator access and automatic switching of on/off-grid.

- 1) Basic function: on-grid, off-grid, switching of on/off-grid;
- 2) Optional function: PV access at the DC side;
- 3) Expansion function: PV and diesel generator access at the AC side(If a diesel generator needs to be connected, please contact Dyness);
- 4) Flexible capacity: The rated output power/capacity of a single product can be flexibly configured as 35kW/71kWh, 40kW/86kWh, 50kW/100kWh;
- 5) System AC expansion: Supports parallel expansion of multiple units, with a maximum of 8 units in on-grid mode, enabling the system's total power/capacity to be expanded up to 400 kW/800 kWh; in off-grid mode, supports a maximum of 4 units, with the system's total power/capacity expandable up to 200 kW/400 kWh.

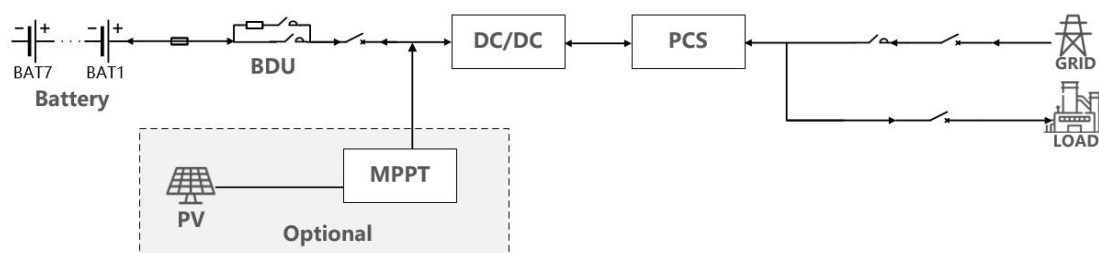


Figure 3-2 System Typology

3.2. Product Model

This manual applies to outdoor air-cooling ESS products (DH100F) of EnerCore series. The definition are explained as below:

DH: Dyness high voltage series products

100: Battery capacity of standard model

F: Fan/air-cooling system

S: Indicate solar, the number after “S” stand for the MPPT channels, “00” means no MPPT module, “02” means 2 MPPT module

L: On&off-grid, the number 01 after L indicates the On&off-grid version

C: Indicate system capacity, the number after “C” means the initial system capacity of different model, unit: kWh

The users can choose from the following models based on their power and system capacity requirements:

Table 3-1 Product Model

No.	Model	Description
1	DH100F-S00L01C70	PV+ESS cabinet, no MPPT, system capacity 71kWh
2	DH100F-S02L01C70	PV+ESS cabinet, 2 MPPT, system capacity 71kWh
3	DH100F-S00L01C80	PV+ESS cabinet, no MPPT, system capacity 86kWh
4	DH100F-S02L01C80	PV+ESS cabinet, 2 MPPT, system capacity 86kWh
5	DH100F-S00L01C100	PV+ESS cabinet, no MPPT, system capacity 100kWh
6	DH100F-S02L01C100	PV+ESS cabinet, 2 MPPT, system capacity 100kWh

3.3. Product Configuration

The product adopt modular design which is more convenient for installation, operation and maintenance, the product configuration list is as follows:

Table 3-2 Product Configuration List

Module	Function	Qty.	Config.
PACK	Used for energy storage, providing stable and continuous power output to the system.	5~7	Standard
PCS	Enables bidirectional conversion between direct current and alternating current.	1	Standard
BDU	Battery control unit and high-voltage power supply.	1	Standard
DC/DC	Implement DC high/low voltage switching, connect to battery and PCS DC side.	1	Standard
MPPT	Support MPPT mode for PV access.	0/2	Optional
Distribution module	AC power distribution, protection, and system energy management control	1	Standard

Security & Fire protection system	Provides intrusion protection, fire prevention, and effective fire extinguishing for equipment.	1	Standard
Air conditioner system	Adjust battery working temperature to ensure it works under optimal temperature.	1	Standard

3.4. System Parameters

The parameter may vary without notice during product upgrade:

Table 3-3 DH100F Parameter

Model	DH100F-C70		DH100F-C80		DH100F-C100	
Battery						
Battery Type	LFP (LiFePO ₄)					
Battery Capacity	280Ah					
Rated Current	140A					
Max. Current	160A					
PACK Configuration	1P16S*5		1P16S*6		1P16S*7	
Voltage Range	232~288Vdc		278.4~345.6Vdc		324.8~403.2Vdc	
Nominal Capacity	71kWh		86kWh		100kWh	
On-grid AC Side						
Rated Power	35kW		40kW		50kW	
AC Maximum Current	61A		69A		86A	
AC Rated Voltage	400Vac					
Wiring Method	3P4L+PE					
Frequency	50Hz/60Hz					
Power Factor	0.8 (Leading)~0.8 (Lagging)					
THDi	< 5% (Rated power)					
Off-grid AC Side						
Rated Power	35kVA		40kVA		50kVA	
AC Maximum Current	61A		69A		86A	
AC Rated Voltage	400Vac					
Wiring Method	3P4L+PE					
Frequency	50Hz/60Hz					
Unbalanced Load	100%					
THDv	< 3% (Liner load)					
Photovoltaic (Optional)						
Max. Input Power	25kW*2		30kW*2		35kW*2	
Max. Input Current	80A*2					
Short-circuit Current	100A					
Input Voltage Range	300~1000Vdc		350~1000Vdc		400~1000Vdc	
Start-up Voltage	375Vdc		440Vdc		500Vdc	
MPPT Path	2					
System						

Weight	1500±100kg	1600±100kg	1700±100kg
Dimension (W*D*H)	1200*1205*2260mm		
Max. Efficiency	84%		
Air Conditioner Power	2kW (Cooling), 1kW (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	≤75dB		
Elevation	3000m (Derating above 2000m)		
Display	Touch screen		
Fire Protection	Aerosol, Multi-sensor/Water ingress, Explosion-proof ventilation		
Overvoltage category	OVC II (PV, BAT, LOAD), OVC III (Grid)		
Communication	Ethernet/4G/RS485		
Certification	CE, LVD, UN38.3		

DH100F series features a system lock function. For details, please refer the *System Lock Policy*.

3.5. Appearance Design

- Dimension: 1200*1205*2260mm (Fixed basement and hanging rings not included)
- Net weight: Approx. 1700kg (Model DH100F-S02L01C100 as reference)
- Product IP grade: IP55
- Anti-corrosion level: C3



Figure 3-3 Product Appearance

The front panel of the product is equipped with an HMI screen, 1 emergency stop button, 3 indicator lights showing the main operating status of the product, and 2 antennas.

HMI screen baffle: Protecting the HMI screen;

Indicator lights from left to right: emergency stop button "EPO", alarm indicator "FAULT" running indicator "RUN" and power indicator "POWER";

Antennas from left to right: 4G, GPS.

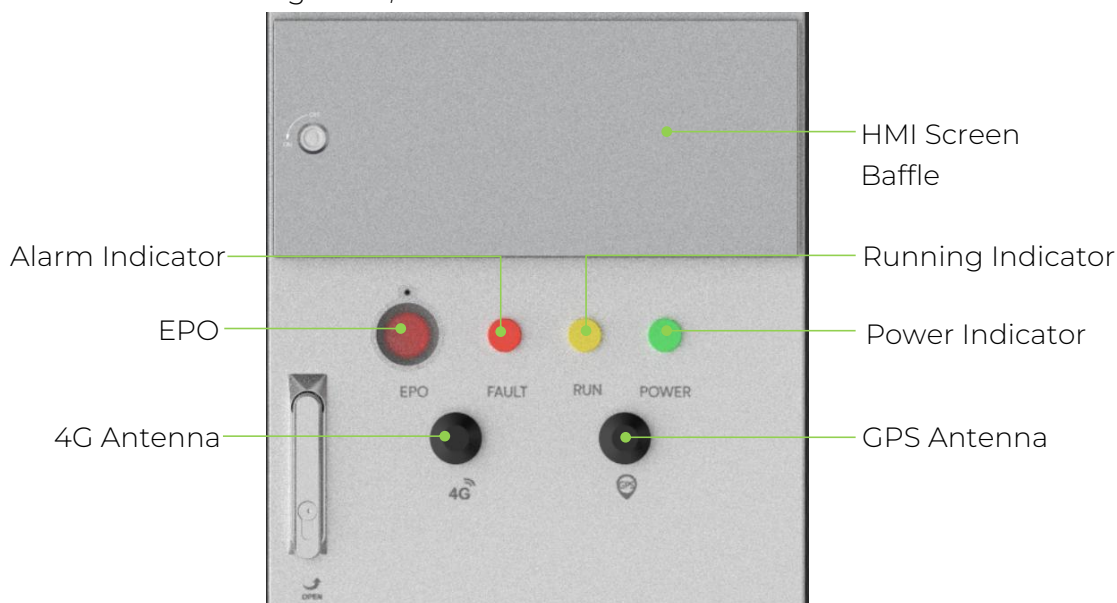


Figure 3-4 Product Indicators

Table 3-4 Indicator Name and Function

NO.	Color	Name	Function
1		EPO	The system stops after the EPO button is pressed, and the system needs to be powered down and restarted after the button is restored to recover from the emergency stop fault
2		FAULT	Constant light indicates a system malfunction
3		RUN	Constant light indicates normal system operation, off indicates standby
4		POWER	Constant light indicates power is applied and ready for operation
5		4G	Receive and send 4G signals
6		GPS	Receive location signals

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

3.6. Internal Design

This product consists of two parts: a battery compartment and an electrical compartment. The battery compartment contains the PACK, BDU, air conditioner, and fire protection system. The electrical compartment contains the MPPT, PCS, DC/DC, and power distribution module. The internal design is as follows:



Figure 3-5 Internal Structure

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 LFP batteries with 280Ah cells, arranged in a 1P16S configuration. The PACK has a rated capacity of 14.33kWh and a rated voltage of 51.2V. Each battery PACK is equipped with one Level 1 BIC module (slave controller) for collecting voltage and temperature parameters of the PACK, and it also has functions such as state of charge balancing and thermal management. The PACK module adopts air-cooled heat dissipation, with an IP20 protection rating, high structural reliability, and low maintenance costs.



Figure 3-6 PACK Diagram

Table 3-5 PACK Configuration

Model Number	HV51280F
String Form	1P16S
Battery Energy (kWh)	14.33
Nominal Voltage (Vdc)	51.2
Nominal Capacity (Ah)	280
Standard Charging/Discharging current (A)	140
Dimension(W*D*H)	568*764*231mm
IP Class	IP20
Operating Temperature	Charging 0°C~+60°C
	Discharging -20°C~+60°C
Operating Humidity	0%~95% RH (Non-condensing)
Storage Temperature	1 Month -20~45°C
	1 Year 0~35°C

**WARNING**

- When battery leakage occurs, or there is 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 accidentally, 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>10kV) 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 bi-directional current-controllable device that connect the grid and ESS. Its main function is to facilitate energy exchange between the battery and grid, as well as control and manage charging/discharging of the battery. It enables bidirectional conversion between DC and AC, allowing AC power to be converted to DC for battery charging and vice versa, converting DC power from the battery to AC for feeding back into the grid.

The product adopts IP20 protection grade. When the product is configured with 7 PACKs, the rated output power is 50kW, when it is configured with 6 or 5 PACKs, the output power will be reduced.



Figure 3-7 PCS Diagram (Image Only for Reference)

Notice: please replace the dust cover regularly, if the dust cover is blocked, the temperature will rise abnormally.

3.7.3. Distribution Module(Including EMS)

The distribution module includes AC circuit breaker, contactor, PV breaker, meter, SPD and EMS, etc., responsible for system protection and system energy management control. EMS is an essential part of ESS. It communicate with PCS, BMS, meter, fire protection system, air conditioner and other devices to control the whole ESS. It can achieve functions like peak-valley arbitrage, peak-shaving, self-consumption, battery priority, anti-flowback, transformer protection function. EMS collects local data and signals, ensures the safe, reliable, efficient, economical operation of ESS through internal control strategies.

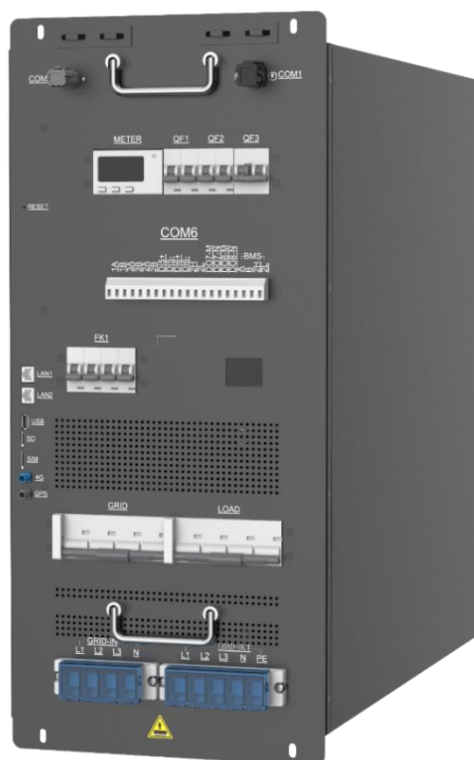


Figure 3-8 Distribution Module Diagram

The external communication interface of this product is marked in the area shown in the figure below:

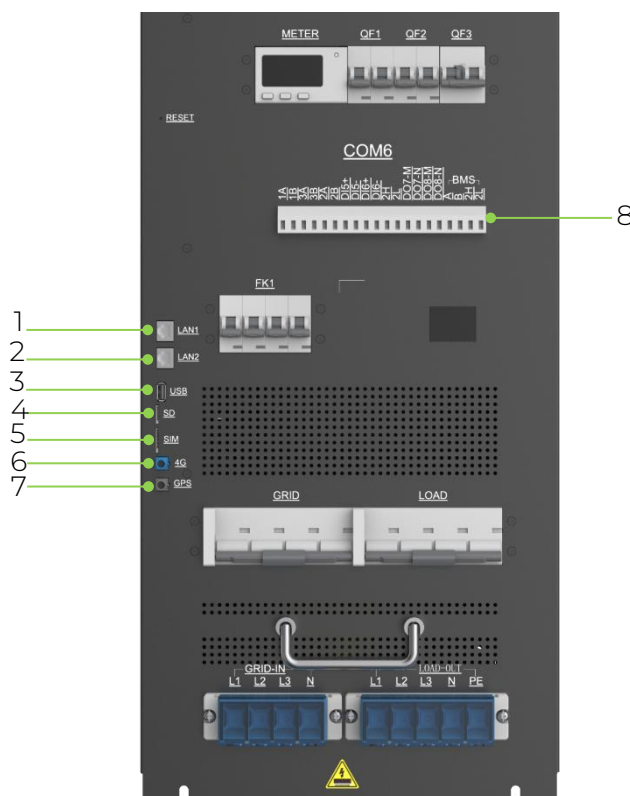


Figure 3-9 Communication Port

Table 3-6 Communication Port Definition

No.	Label	Definition
1	LAN1	DHCP MODBUS_TCP port
2	LAN2	Ethernet Dyness cloud platform port
3	USB	USB port, for EMS local program upgrade
4	SD	SD card port, for local data storage
5	SIM	SIM card port
6	4G	4G antenna port
7	GPS	GPS antenna port
8	COM 6	External communication port

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 3-10 BDU Diagram

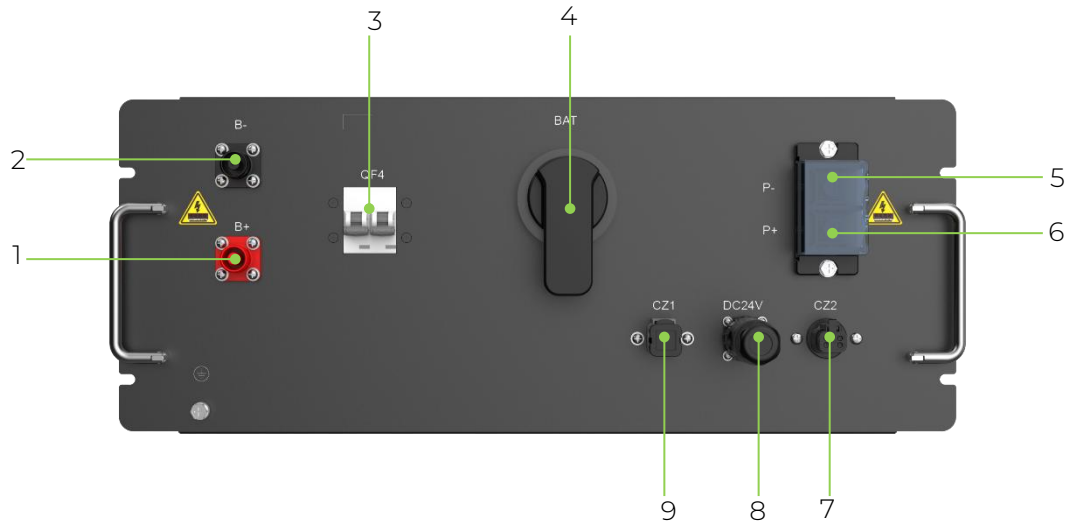


Figure 3-11 BDU Port Diagram
Table 3-7 BDU Port Definition

No.	Label	Definition
1	B+	Battery cluster positive terminal input
2	B-	Battery cluster negative terminal input
3	QF4	System auxiliary power switch
4	BAT	Battery main circuit breaker
5	P-	Battery cluster negative terminal output
6	P+	Battery cluster positive terminal output
7	CZ2	PACK fan power and communication
8	DC24V	System auxiliary power
9	CZ1	System communication

3.7.5. MPPT

Supports MPPT mode for connecting photovoltaic panels to achieve maximum power tracking or connecting to AC/DC to supply power to loads, thereby improving the conversion efficiency of photovoltaic panels; This module features protection functions such as overcurrent protection, overtemperature protection, low-voltage side overvoltage/undervoltage protection, high-voltage side overvoltage/undervoltage protection, overpower protection, low-voltage side short-circuit protection, and reverse connection protection; The DC input voltage on the photovoltaic side must be greater than the highest voltage of the battery system, meaning the MPPT module connects the battery on the low-voltage side and the photovoltaic panels on the high-voltage side. The number of MPPT module can be chosen from 0 or 2 based on PV power needs.



Figure 3-12 MPPT Diagram (Image Only for Reference)

3.7.6. DC/DC

The DC/DC converter enables high-low voltage switching of direct current. When used in conjunction with a PCS, it connects the battery to the DC side of the PCS to increase the input voltage on the battery side, thereby meeting the battery voltage operating range requirements of the PCS. This module is a boost-type DC/DC module, meaning that the low-voltage side of the DC/DC module is connected to the battery, while the high-voltage side is connected to the PCS.



Figure 3-13 DC/DC Diagram (Image Only for Reference)

Notice: please replace the dust cover regularly, if the dust cover is blocked, the temperature will rise abnormally.

The module is the same size and appearance as the PCS and can be distinguished by silkscreen.

3.7.7. Security & Fire System

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

Security Protection System

- **GPS:** Positioning system installed to reduce the risk of theft.
- **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 battery compartment. When water is detected in the cabinet, the EMS will report a water immersion fault and the system will shut down.

Fire Protection System

- **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 triggers the aerosol spray when the temperature inside the battery compartment rapidly rises to approximately 185°C 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.

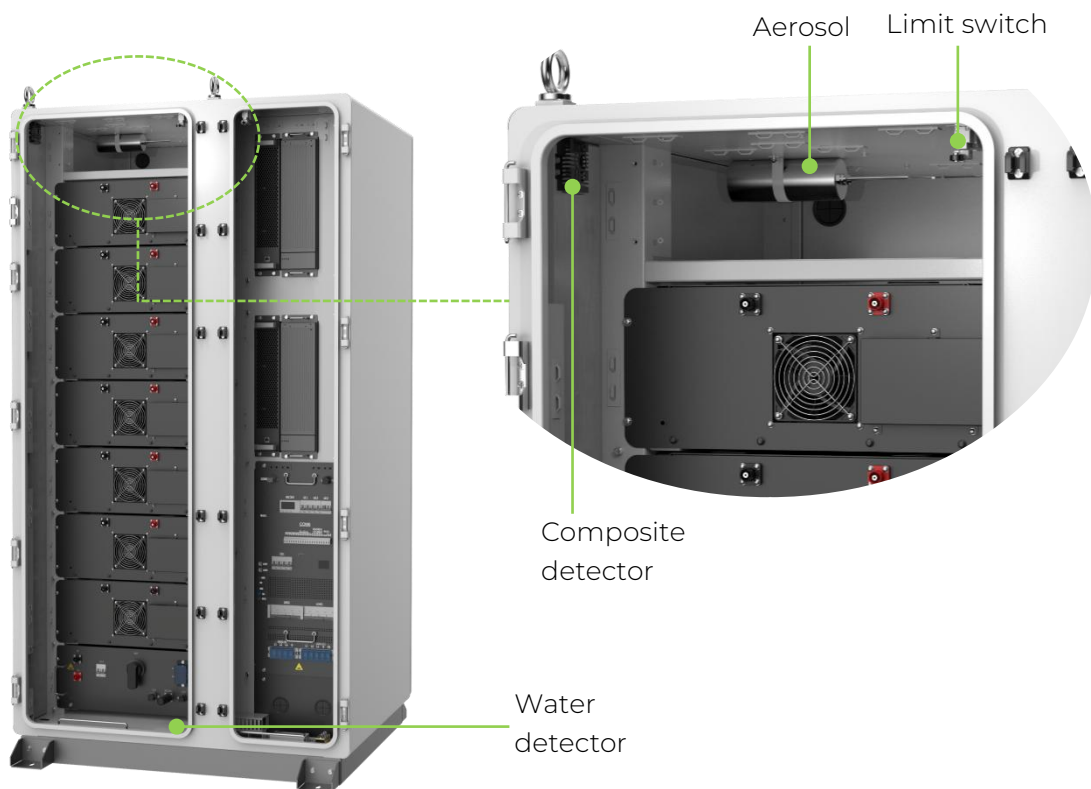


Figure 3-14 Security & Fire System Diagram

The maintenance of the fire protection system should comply with the fire 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.

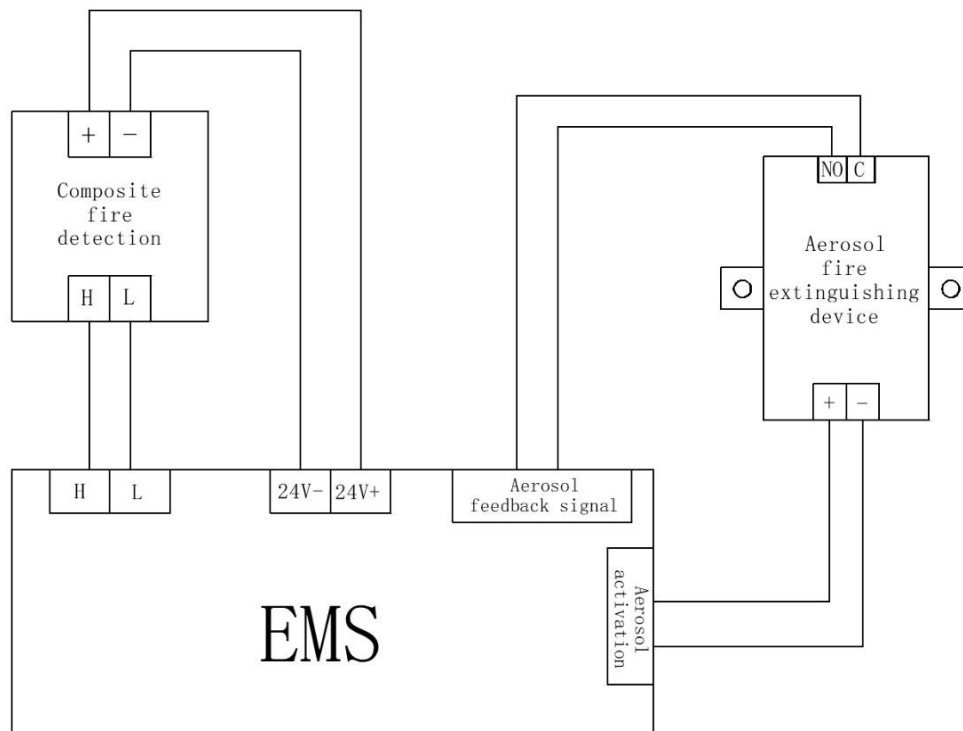


Figure 3-15 Fire Protection Schematic Diagram

3.7.8. Air Conditioner

This system is an air-cooled system equipped with one industrial air conditioner with a cooling capacity of 2 kW and a heating capacity of 1 kW.

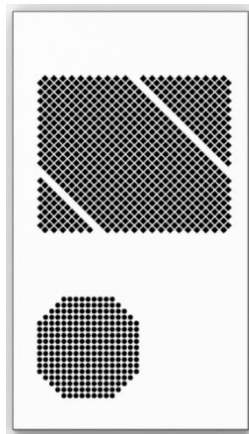


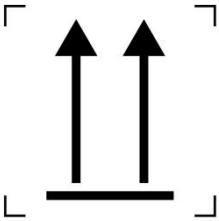
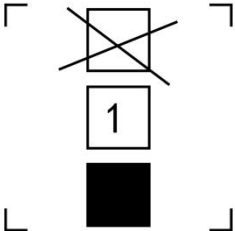
Figure 3-16 Air Conditioner Diagram

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 重心	Center of Gravity: Indicates the center of gravity of the package to facilitate lifting.

	Forklift Insertion Point: Insert the forklift here for moving 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 mode is 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 collision, if any problem is found, please contact Dyness or the transportation company in time.

Shipping Requirement

- All necessary equipment in the product have 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, reserve buffer between the wooden box and 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.

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 excessive tilting during transportation.

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 lifting process;
- The equipment shall be suspended after being lifted from the ground by 300mm, 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.



Figure 4-1 Lifting Transportation

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:



False Shipping
Method:

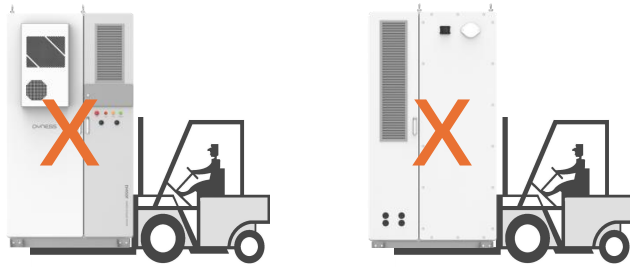


Figure 4-2 Forklift Transportation

4.5. Storage Requirement

Storage Environment Requirements

- The product should be stored on dry, flat (flatness should be no more than 5mm), 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°C, humidity: 0~95%(no condensation).
- Pay attention to cope with the harsh environment around, such as sudden cold, sudden heat, collision, etc., so as not to cause damage to the PACK.

Storage Operating 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), inspecting visually before installation to ensure there is no condensation and verify if 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 SOC of 25~40%.

5. Installation

Only a qualified electrical engineer can operate related electrical connection. Please comply with the requirements given in "Safety Instructions" in chapter 2 and we shall not be liable for casualties or property loss caused by neglect of safety instructions.



DANGER

- Do not touch the live parts!
- Ensure both AC and DC sides are not energized before installation. All electrical connections must be operated under de-energized condition;
- 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

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 gas 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 $>3\text{t/m}^2$, a service life of >50 years, and a level of $<3\text{mm/m}^2$.
- 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 both bottom-mounted and rear-mounted wiring solutions. Users can select the appropriate foundation solution based on their actual needs:
 - ① **Option 1** (bottom cable outlet): The height of the equipment foundation must be $\geq 300\text{mm}$. When constructing the equipment foundation, the cable outlet of the energy storage system must be taken into consideration, and a trench or inlet hole must be reserved for the cable to enter and exit from the bottom of the equipment.
 - ② **Option 2** (rear cable outlet): The energy storage system is placed flat on the surface of the equipment foundation, and the cable enters and exits from the rear of the equipment.

5.2. Installation Spatial Requirements

The product adopts front-rear ventilation. Make sure that the equipment has enough space for better cooling and maintenance, it is advised to reserve enough space around the cabinet installation position.

- The space reservation distance in front of the product is not less than 800mm.
- The space reservation distance at the rear of the product is not less than 600mm.
- The space reservation distance of the left part of the product is not less than 500mm.
- The space reservation distance of the right part of the product is not less than 300mm.

- The product supports side-by-side installation, with a minimum space of 100 mm required between cabinets.

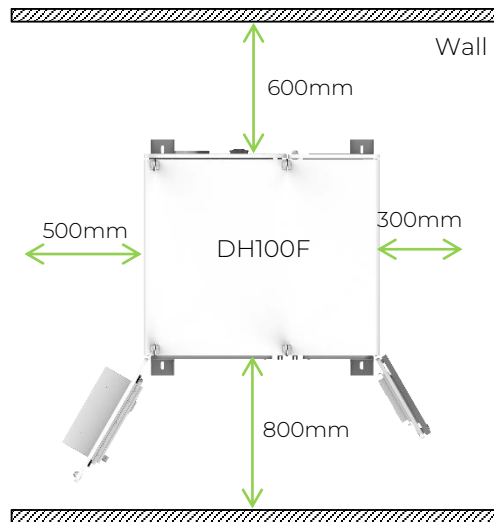


Figure 5-1 Single Product Installation

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.

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 Iron Brackets

Angle steel fixing tool

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

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.

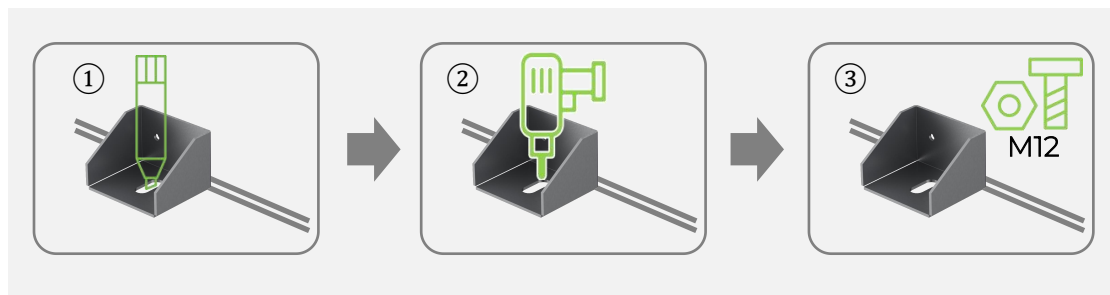


Figure 5-3 Angle Steel Fixing Steps

5.3.3. Grounding Installation

There are grid PE and load PE inside the product.

For off-grid applications, RCD (Residual Current Device) need to be installed at the off-grid port, with type AC being recommended.

The grounding connection must comply with local laws and regulation. Please

consider the actual situation at project site and follow the instructions of the power station staff during the process of ground connection, the grounding connection is shown as follows:

- ① Prepare two PE cables(6AWG), label them as PE1 (Grid PE) and PE2 (Load PE);
- ② The PE cables enter from the inlet hole (as shown in position 1) at the bottom of the electrical compartment ;
- ③ Connect PE1 cable to the protective copper bar (as shown in position 2);
- ④ Connect PE2 cable to the load PE port (as shown in position 2);
- ⑤ Grounding cables and terminal requirements should refer to 5.6;
- ⑥ Use bolt to fix the DT terminals to the copper bar, terminal connections could refer to 5.7.

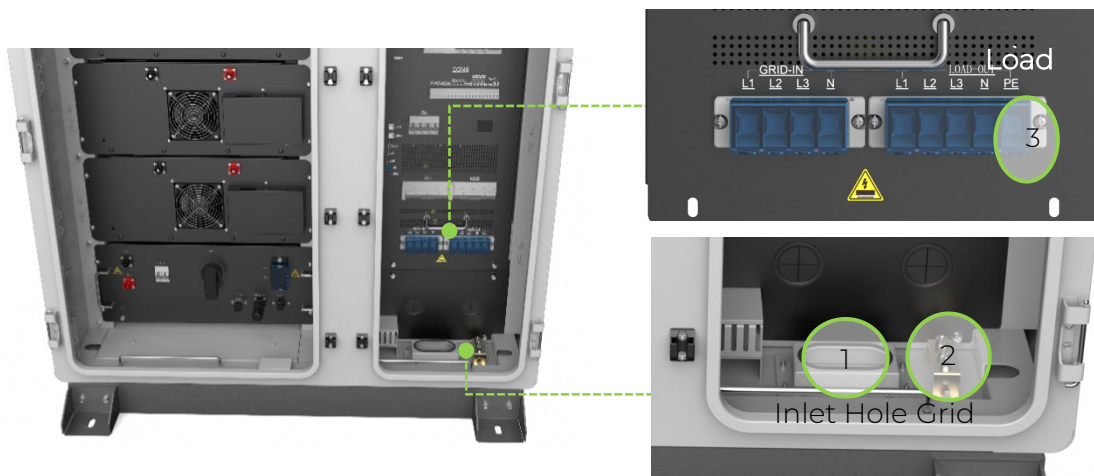


Figure 5-4 Grounding Step

After the grounding connection, the grounding resistance must be measured, and the specific grounding resistance value must comply with relevant region/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 under lock state;
- ② Moving the lid up above the locking hole;
- ③ Getting the key in the door and revolve it clockwise;
- ④ Rotating the handle clockwise to the position shown in the figure to open the door.

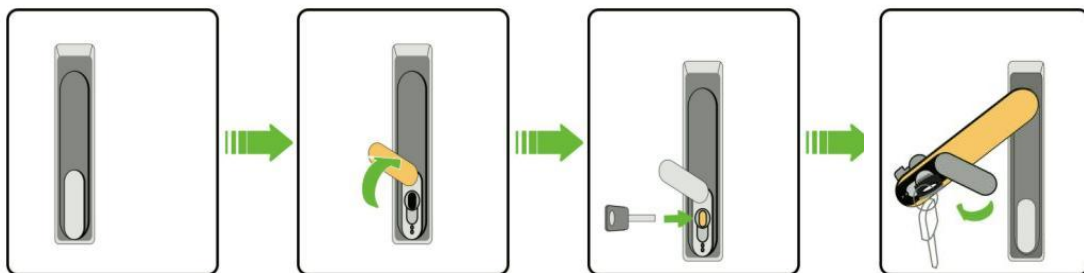


Figure 5-5 Door Open Steps

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

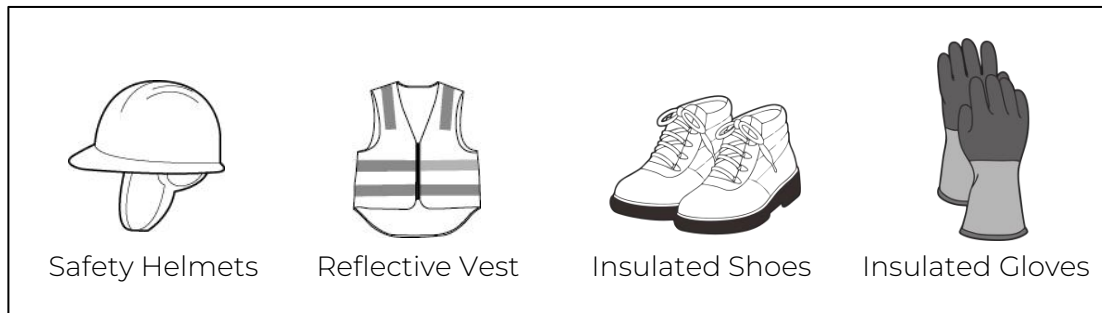


Figure 5-6 Safety Gear

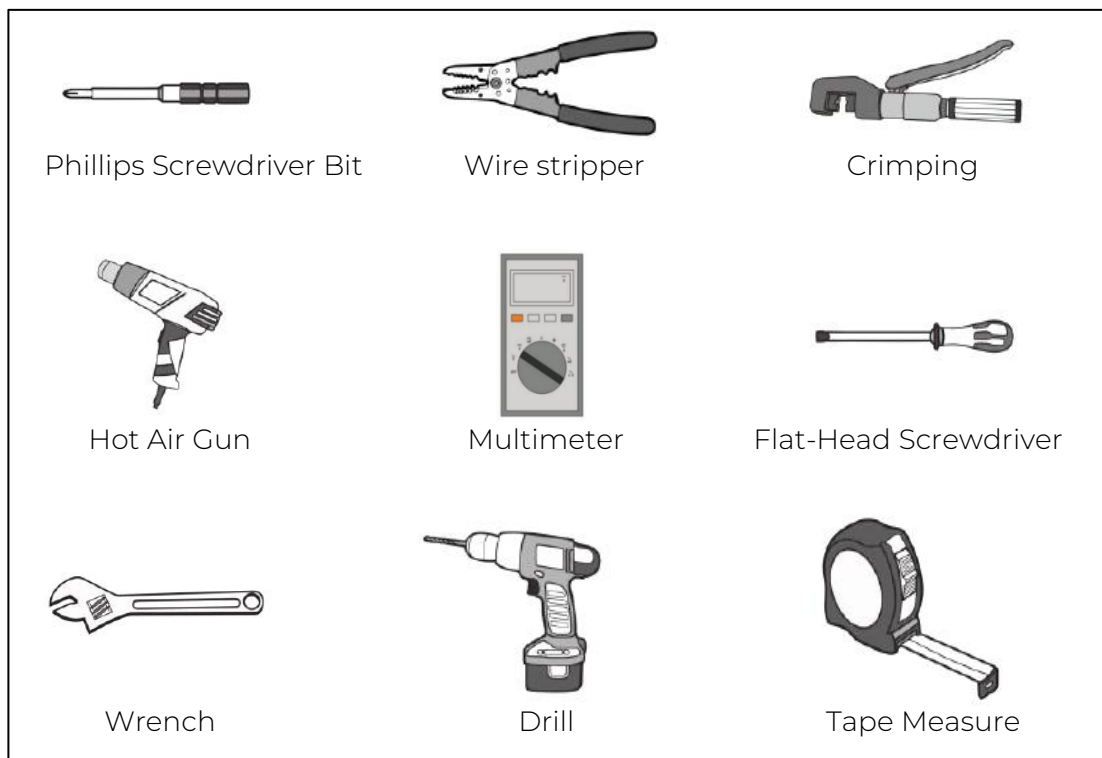


Figure 5-7 Tools

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. Wiring Accessories 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-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.

Notice: Pay attention to torque during installation. The following accessories, such as power cables, control cables, terminals, and transformers, are to be provided by the customer.

Table 5-1 Wiring Accessories

No.	Type	Specifications	Terminal Model	Torque
1	Power cable (Grid port)	Outdoor single-core copper cable 4AWG	SC25-6	5.0Nm
2	Power cable (Load port)	Outdoor single-core copper cable 6AWG	SC16-6	5.0Nm
3	PV cable	Outdoor single-core copper cable 6AWG	SC16-6	5.0Nm
4	Grounding cable	Outdoor single-core copper cable/yellow-green dual color 6AWG	SC16-6	5.0Nm
5	Grounding bar	40*4mm	/	/
6	RS485/CAN communication line	Two-core twisted pair shielded cable 20AWG	/	/

7	Ethernet communication line	Category 6A network cable	/	/
8	Voltage sampling line	UL1015 cable 16AWG	/	/
9	Current sampling line	UL1015 cable 14AWG	/	/
10	Parallel line	Shielded twisted pair cable 20AWG	/	/
11	Direct Meter (400V)	ADL400-C	/	/
12	Indirect Meter (medium/high voltage)	DTSD1352	/	/
13	Direct CT	0~5000A/5A (The current value depends on the project), work with direct meter	/	/
14	Indirect CT	0~5A/0~20mA, work with indirect meter	/	/

5.7. Terminal Wiring Method

OT/DT/SC terminals connection step:

- ① Peel off the insulation layer from the cable terminal, and the length of which should be the depth of the wire hole on the copper terminal, plus an additional 2-3mm.
- 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/SC terminal).
- ③ Use hydraulic pliers to firmly crimp the copper terminally.
- ④ Slide the heat-shrink tube onto the copper terminal (OT/DT/SC terminal) to fully cover the wire hole. Use a heat gun to tighten the heat-shrink tube.

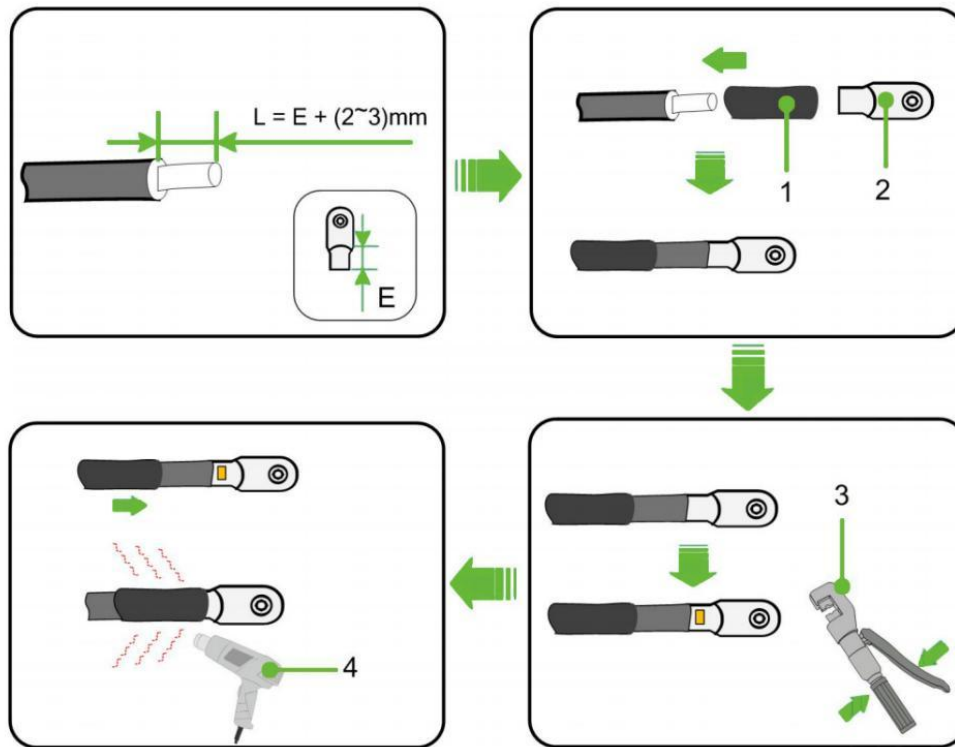


Figure 5-8 The Connection Sequence of Wiring Components

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

5.8. Checking Before Wiring

1) Checking breakers

Check whether the next following circuit breakers is in the disconnected position.

- Secondary breaker ("QF4") on the front panel of BDU (As shown in position 1);
 - Battery breakers ("BAT") on the front panel of BDU (As shown in position 2);
 - Secondary breaker("QF1", "QF2", "QF3") on the front panel of distribution module (As shown in position 3);
 - Grid breakers ("GRID") on the front panel of distribution module (As shown in position 4);
 - Load breakers ("LOAD") on the front panel of distribution module (As shown in position 5);
 - PV switches ("PV1"/ "PV2") on the back panel of distribution module (As shown in position 6, if MPPT is not configured, there is no such switch.).
- Note: The SPD switch ("FK1") needs to be closed (As shown in position 7).

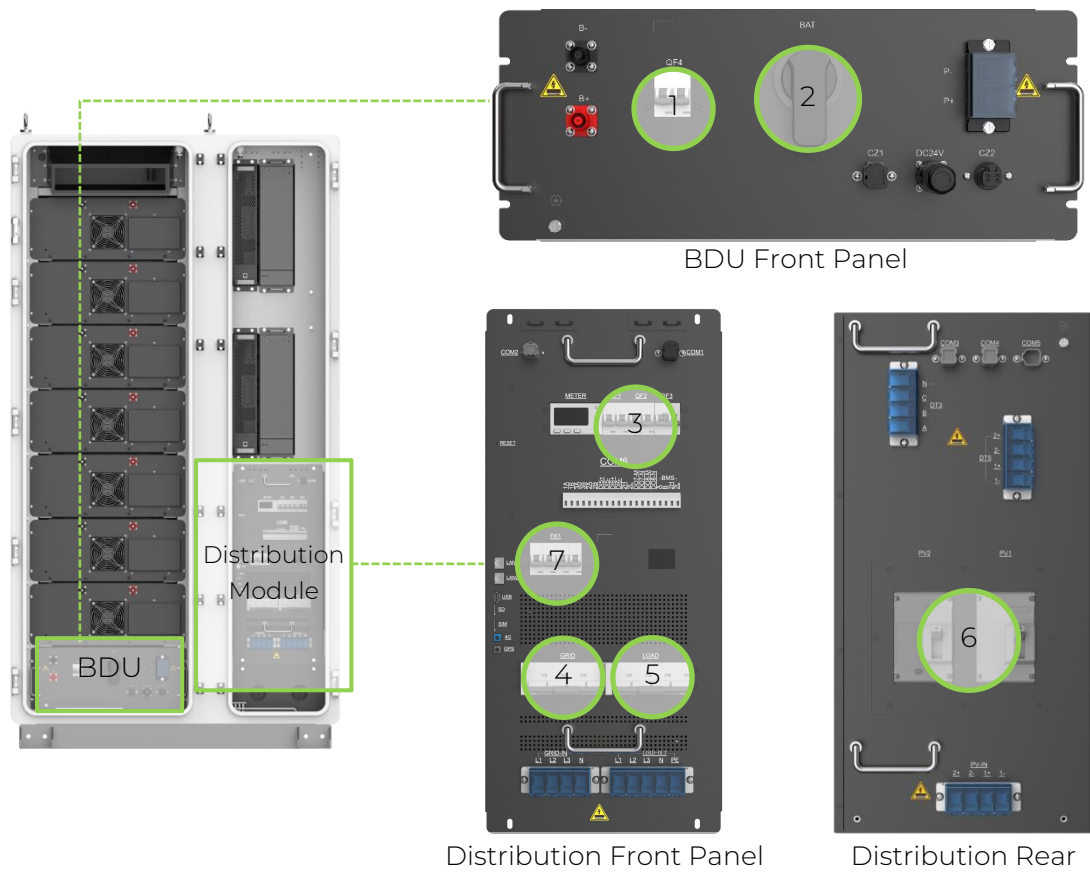


Figure 5-9 Breakers Location

2) 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 cable are labeled correctly.	☐
3	The related wiring accessories are ready.	☐
4	The wiring operator have worn protective devices.	☐
5	Checking if all the breakers are in disconnected position	☐

5.9. Wiring Diagram

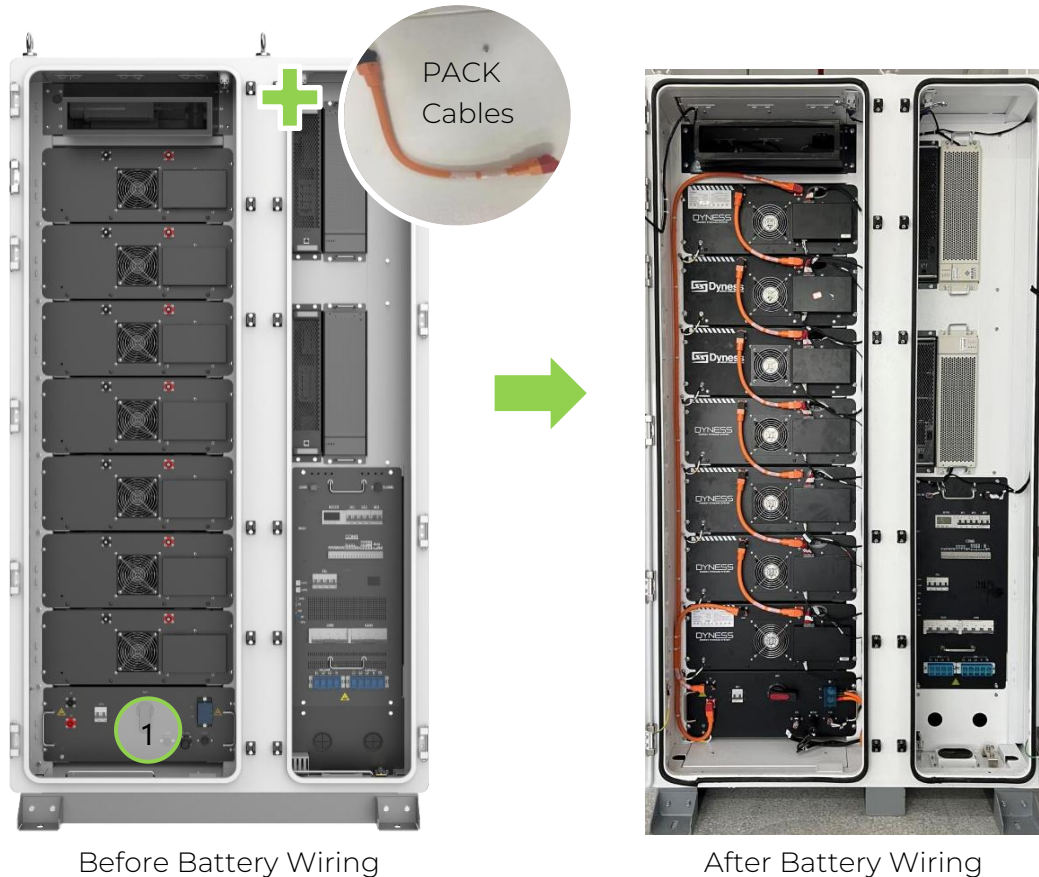
Step 1: Battery Connection

To ensure the safety of the product, the power cables for the batteries are shipped with the product and need to be installed on-site as follows:

- (1) Please reconfirm the battery switch is off (as shown in position 1);
- (2) **PACK cables connections:** connect the PACKs in series with cables, where the negative terminal of the upper PACK is connected to the positive terminal of the lower PACK, please ensure the connection sequence is correct;

- (3) **PACK and BDU connection:** the positive terminal of PACK is connected to the positive terminal of BDU, the negative terminal of PACK is connected to the negative terminal of BDU.

Notice : the color of PACK and BDU terminals: red represents positive, black represent negative.



Before Battery Wiring

After Battery Wiring

Figure 5-10 Battery Connections

Step 2: PV Connections

The product that is equipped with MPPT module, it need to connect the PV cables, please skip this step without MPPT.

- (1) Please reconfirm the PV switches ("PV1" and "PV2") are off (as shown in position 1), and measure with DC setting of multimeter to make sure there is no voltage;
- (2) Guide the PV cables into the rear electrical compartment through the inlet hole (as shown in position 2);
- (3) Bring the PV cables to the connection are that labeled "PV-IN" (as shown in position 3), make sure the PV cable are connected in correct sequence;
 - 1+/1- represents the positive/negative connection of PV1;
 - 2+/2- represents the positive/negative connection of PV2.
- (4) After completing the connections, gently tug on the cables to ensure there is enough slack.

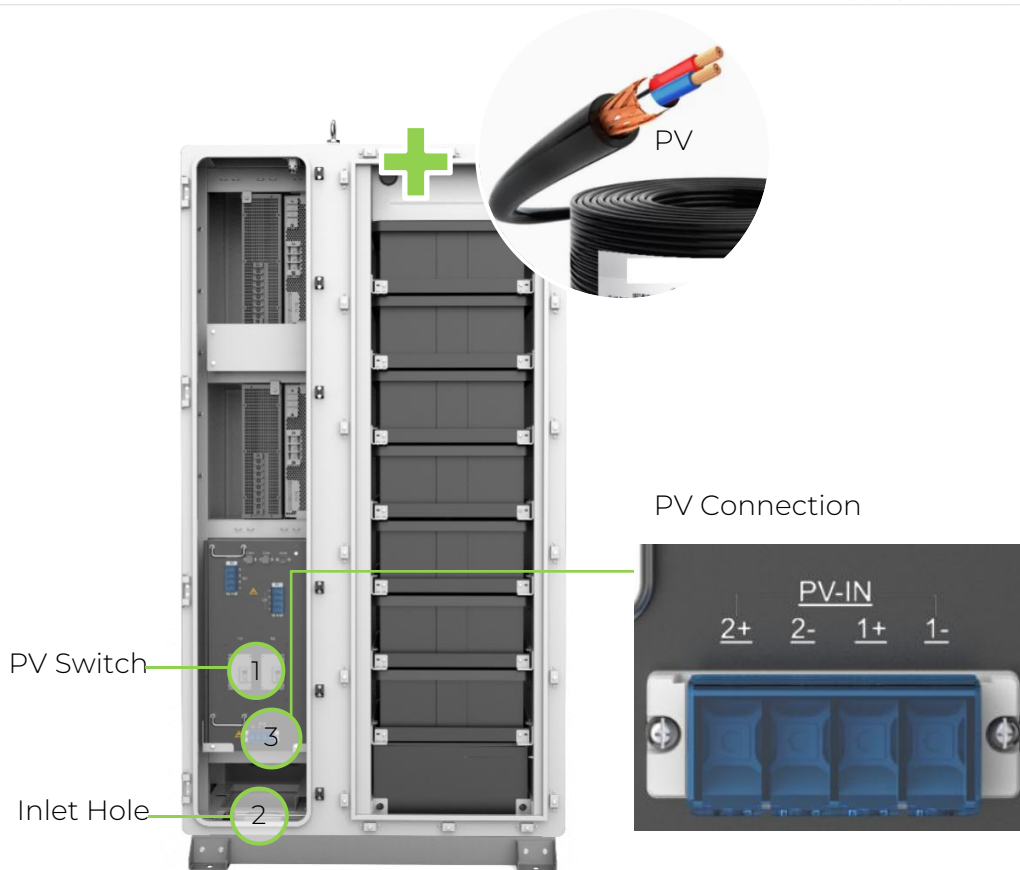


Figure 5-11 PV Connection Step

Step 3: Grid Connections

- (1) Please reconfirm the grid switch (labeled “GRID”) are off (as shown in position 1), and measure with AC setting of multimeter to make sure there is no voltage;
- (2) Guide the Grid cables into the front electrical compartment through the inlet hole (as shown in position 2);
- (3) Bring the grid cables to the connection are that labeled “GRID-IN”(as shown in position 3), make sure the cables L1, L2, L3, N are connected in correct sequence;
- (4) Use bolt to fix the terminals;
- (5) After completing the connections, gently tug on the cables to ensure there is enough slack.

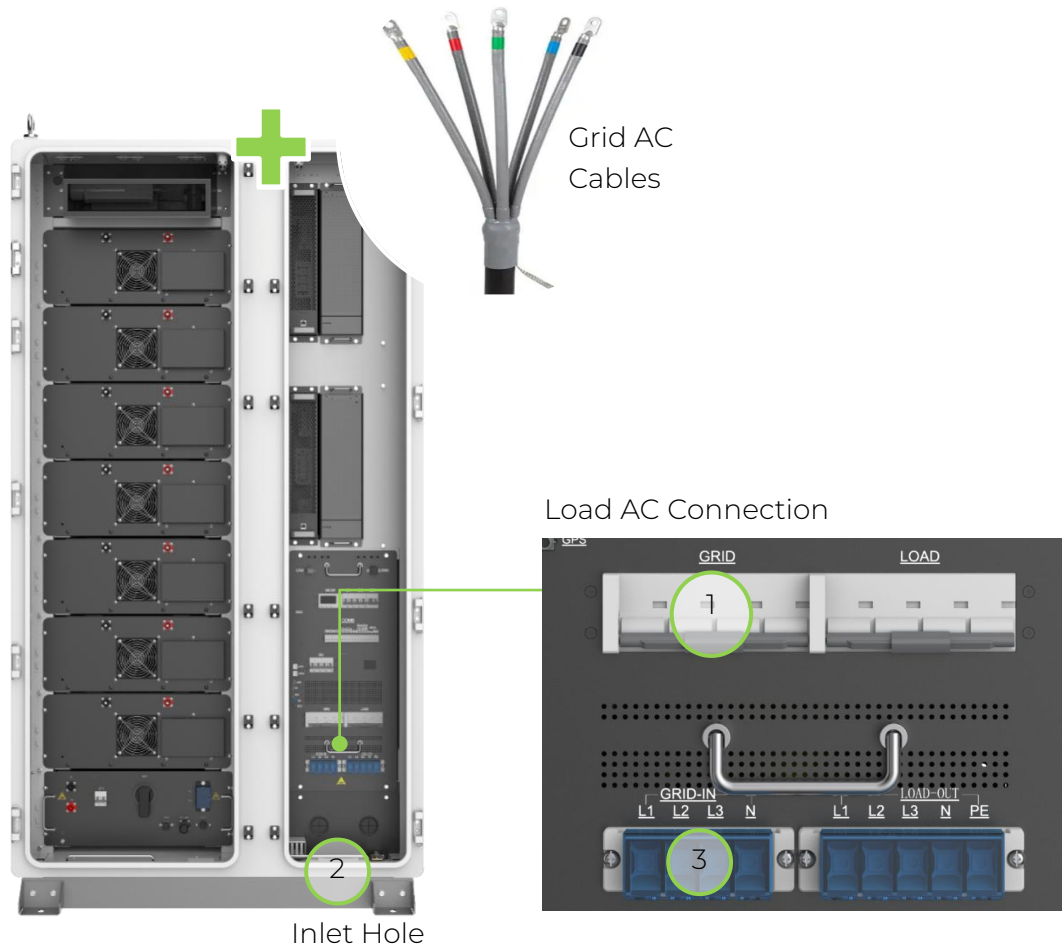
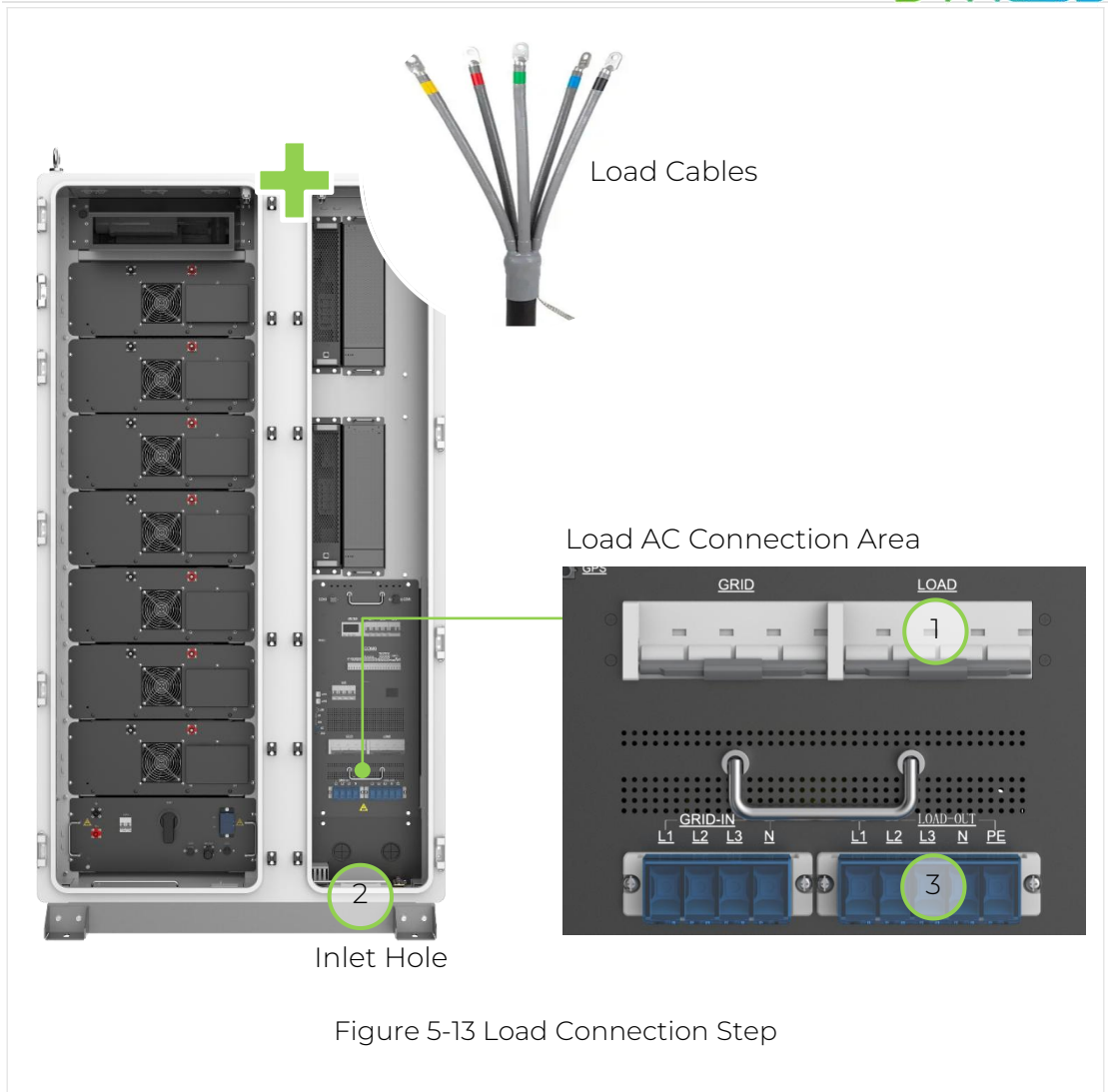


Figure 5-12 Grid Connection Step

Step 4: Load Connections

- (1) Please reconfirm the Load switch (labeled “LOAD”) are off (as shown in position 1), and measure with AC setting of multimeter to make sure there is no voltage;
- (2) Guide the Load cables into the front electrical compartment through the inlet hole (as shown in position 2);
- (3) Bring the load cables to the connection are that labeled “LOAD-IN” (as shown in position 3), make sure the cables L1, L2, L3, N are connected in correct sequence;
- (4) Use bolt to fix the terminals;
- (5) After completing the connections, gently tug on the cables to ensure there is enough slack.



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

5.10. Checking After Wiring

Please check the following checklist after wiring to avoid equipment damage.

Table 5-4 Checklist Bfore Wring

NO.	Checklist	Confir m
1	Disconnect the battery switch and grid battery before measuring, please ensure the AC side and DC side of PCS ARE not energized.	☐
2	Please check if the negative and positive connection between battery-DC/DC-PCS, the AC phase of PCS are connected correct. Measure the resistance between the three phase, which should be in the MΩ level, if it is in kΩ level or smaller, please check the circuit.	☐
3	Check if External cables, PE cables and communication cables are well connected.	☐
4	The PE cable resistance should be less than 4Ω;	☐

5	Clean the installation area and ensure that there are no tools or other irrelevant objects left inside the ESS cabinet.	☐
6	Use fireproof and waterproof materials to tightly seal the openings and gaps around the ESS cabinet's entry and exit holes.	☐

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(FK1) in closed state;	☐
4	Check 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 multimeter;	☐
6	Check to make sure no tools or parts are left inside the device;	☐
7	Check if there is condensation, if so, must open the ESS cabinet for ventilation until condensation disappears;	☐
8	Check if the air conditioner in normal state and 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” grid circuit breaker on the front panel of the distribution module;

Step 2: Close the “BAT” battery circuit breaker on the BDU;

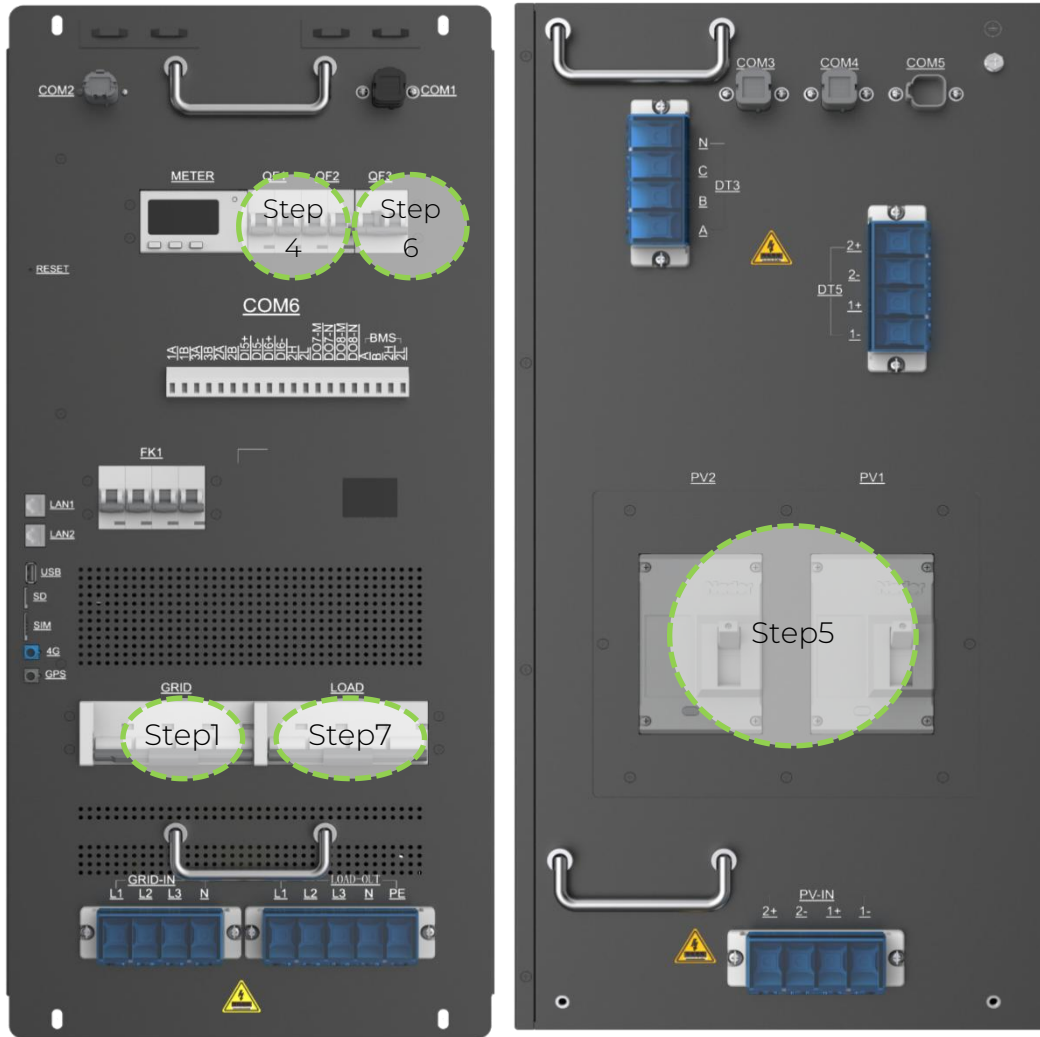
Step 3: Close the “QF4” secondary circuit breaker on the BDU;

Step 4: Close the “QF1” and “QF2” secondary circuit breakers on the front panel of the power distribution module;

Step 5: Close “PV1” and “PV2” photovoltaic disconnect switches on the rear panel of the power distribution module in turn (this step can be skipped if the MPPT module is not configured);

Step 6: Close the “LOAD” load circuit breaker on the front panel of the power distribution module;

Step 7: Set the EMS operation mode according to the application, and make the EMS work in automatic mode after setting.



Distribution Module Front Panel

Distribution Module Rear Panel



BDU Schematic

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 light are on, and "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, operation process could refer to the above image)

Step 1: Stop the system through the HMI screen or host computer;

Step 2: Disconnect the “LOAD” load circuit breaker;

Step 3: Disconnect “PV1” and “PV2” photovoltaic disconnect switches in turn;

Step 4: Disconnect “QF1” and “QF2” secondary electric circuit breakers in turn;

Step 5: Disconnect “QF4” secondary electric circuit breaker;

Step 6: Disconnect the “BAT” battery circuit breaker;

Step 7: Disconnect the “GRID” grid 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.

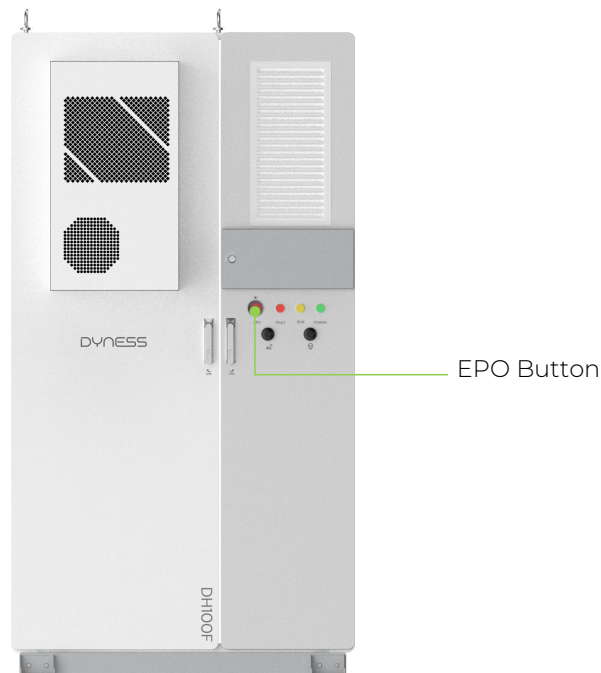


Figure 6-2 EPO Location



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 quick response and protect personal and equipment safety!

7. HMI Operation

7.1. Main Features Overview

The HMI screen is the core interface for operators to interact with the system. It is designed to provide real-time monitoring, operational control, status diagnosis, and system configuration capabilities to ensure the safe, efficient, and stable operation of the system. It is divided into two main categories: automatic mode and remote mode.

7.1.1. Automatic Mode

In automatic mode, the system EMS can accept energy dispatching from the system HMI and Dyness cloud platform. Its main functions are as follows:

①Anti-backflow

For application where PV is not allowed to feed the grid, EMS will control PV output supply the load first, and store excess PV energy to ESS. When neither ESS nor loads can consume the excess PV energy, it will limit PV output to prevent PV feeding the grid.

②Transformer protection

Grid-side transformer protection enable, transformer protection power can be set, real-time detection of transformer-side power through the anti-reverse current meter, adjusting the charging and discharging power of the energy storage system, to avoid the transformer-side power exceeding the protection limit value.

③SOC settings

The SOC settings can be adjusted to balance system availability, maintain battery life, and increase battery safety.

④Generator settings

Supports connection to diesel generator equipment and allows for settings such as generator start-up, charging, SOC, and power limits.

⑤Reactive power compensation

Take technical measures to provide the required reactive power to the power grid or electrical equipment in order to maintain or improve system voltage levels, increase power factor, reduce line losses, optimize power grid operating efficiency, and improve power quality.

⑥Operating mode

The system provides four operating modes: Scheduled mode, Peak shaving, Self-consumption, and Battery priority, each of which executes different strategies:

a)Scheduled mode

By leveraging time-of-use electricity price differentials in the power market to "buy low and sell high", you can reduce electricity costs or increase revenue from electricity sales. Different time periods can be set based on different electricity pricing policies. The scheduling mode is divided into two types: "Any periods" and "48 periods":

- [Any periods]: Customize charging and discharging periods based on sharp, peak, flat, and valley electricity prices;

- [48 periods]: Based on sharp, peak, flat, and valley electricity prices, charging and discharging settings are divided into a maximum of 48 time periods per day, with a minimum unit of half an hour.

b) Peak shaving

Based on user's electricity consumption pattern, peak value and valley value are set to reduce peaks loads and fill in low-load valleys, so as to balance the power generation and consumption. The PV maximize its output under this mode, if the system enables anti-backflow function, then it will limit PV output when it triggers anti-backflow function.

- When $P_{\text{grid}} > P_{\text{peak value}}$, the ESS start discharging;
- When $P_{\text{grid}} < P_{\text{valley value}}$, the ESS start charging.

c) Self-Consumption

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

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

d) Battery priority

When the system is in battery priority mode, photovoltaic power generation prioritizes charging the battery, that is:

- When P_{DG} is high, PV energy is prioritized for charging the system battery, and excess energy is discharged to the AC side;
- When P_{DG} is insufficient, the system battery is charged by both PV and the power grid.

7.1.2. Remote Mode

System only accepts commands from external EMS which could control the system through the EMS of this product.

7.2. Operation System Overview

The product is equipped with 7-inch screen, on where the users could check the system information and set system parameters.

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		
		AC/DC		
		Battery		
		Load		
		PV		
	Data	EMS	Status	
			Parallel	
			INV/CHG data	
			S-P-F-V data	
		AC/DC	Basic data	

			Alarm data	
		DC/DC	Basic data	
			Alarm data	
		MPPT	Basic data	
			Alarm data	
		BMS data	Basic data	
			Cell voltage data	
			Temperature data	
			Alarm data	
		Sys data	Meter	
			FFS	
			Air-conditioner	
		Alarm Info	Alarm	
			History	
		Version Info		
	Setting	EMS	Runset	Automatic mode
				Remote mode
			DataSet	SysParam
			SysSet	Basic Set
	Login	Permission		
		Modify		

Please notice: the HMI interface may vary with version update, the images in this chapter is only for reference.

HMI main interface

- **Dashboard:** display the details of system access device;
- **Data:** query the detailed data, alarm information, version information of each sub-module of the system;
- **Setting:** setting the related system parameters (please notice the user could only change the EMS parameters);
- **Login:** the permission for login the system.

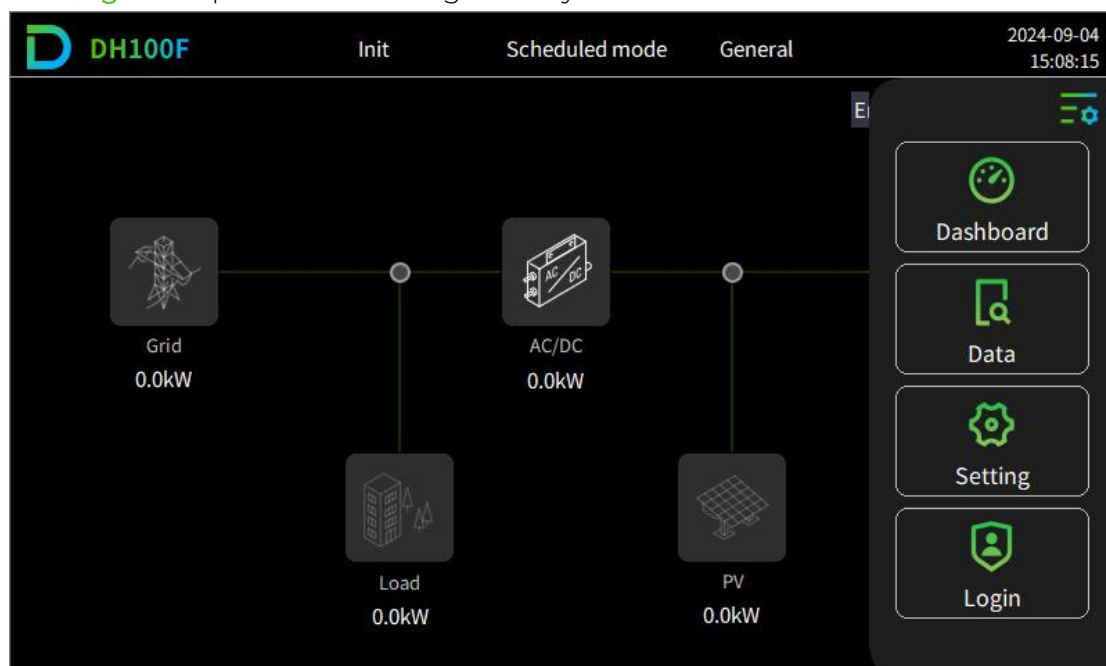


Figure 7-1 HMI Main Interface (Image Only For Reference)

7.3. User Login

Table 7-2 Login Permission Description

Permission	Description
Not login	When not log in, the user could only read the system running data, cannot set the device.
Install	The user could check the system running data and set related system parameters. This permission is only open to on-site installation personnel, the original password is 1111.
Advanced user	Only open to the manufacturer staff.

Login step

- Step 1: Click [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 password(1111), click [“Login”](#);
- Step 4: Click [“Confirm”](#) in the prompt popup.

-- END



Figure 7-2 General User Login Step

Change password

- Step 1: Click [“Modify”](#) at the upper left of navigation bar;
- Step 2: Input old password and new password, complete the setting, then click [“Confirm modification”](#);

-- END

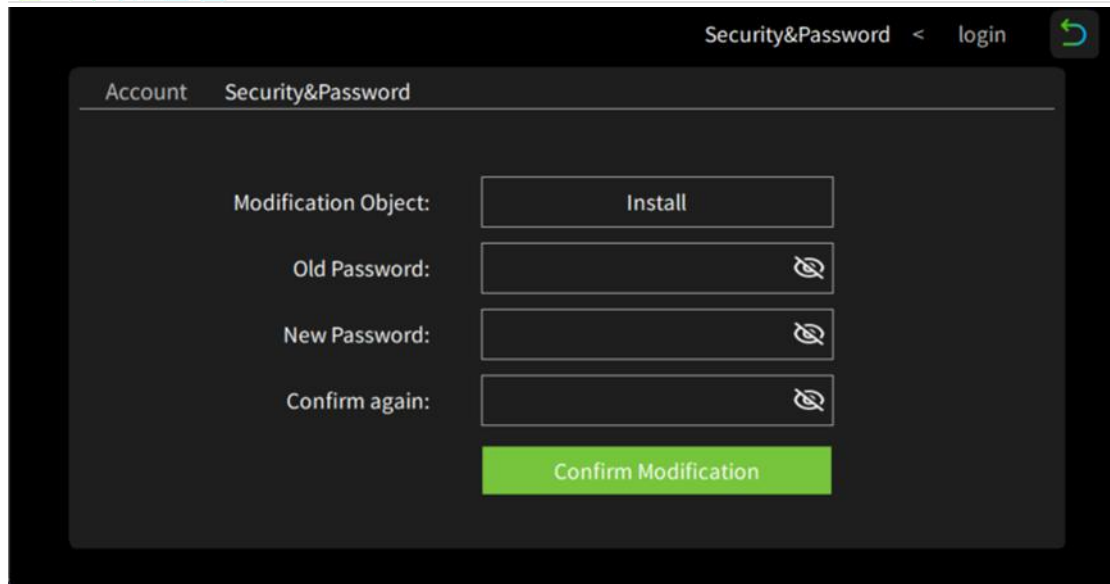


Figure 7-3 Change Password Diagram

7.4. Running Information

Method 1

Click corresponding icons on the main interface and directly enter corresponding module data interface.

- Click Grid icon , enter Grid interface;
- Click Load icon , enter Load interface;
- Click AC/DC icon , enter AC/DC interface;
- Click Battery icon , enter Battery interface;
- Click PV icon , enter PV interface.

Method 2

- Step 1: Click main menu icon  on the upper right corner of the main interface;
- Step 2: Click "Dashboard" under main menu bar;
- Step 3: Select corresponding sub-menu (Grid/ AC/DC / Battery / Load/ PV) as needed.

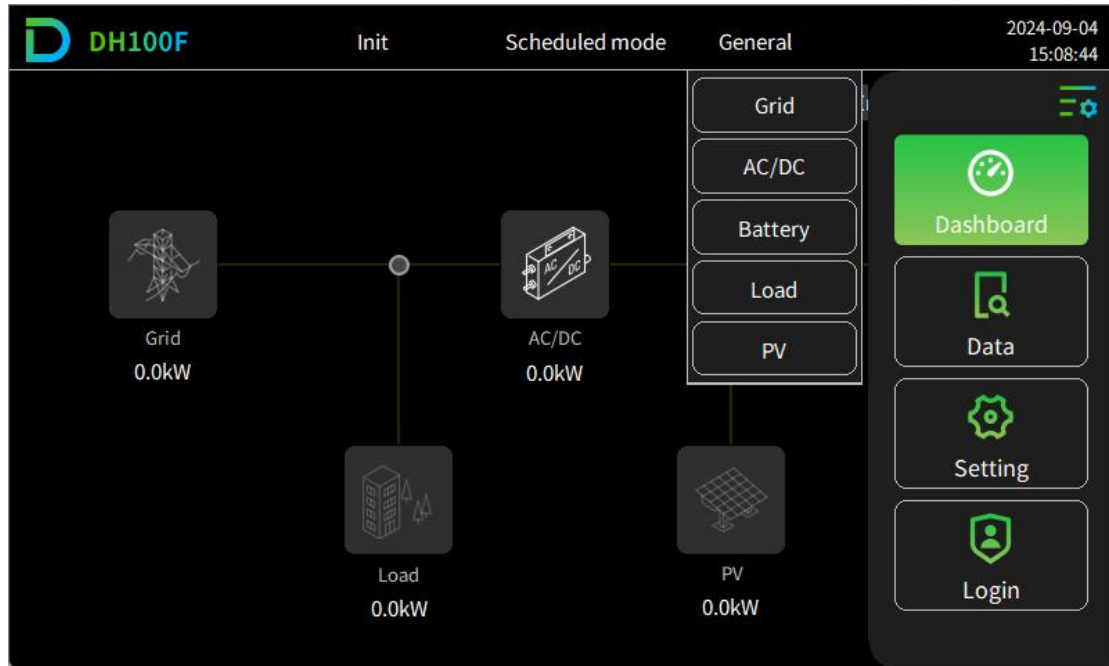


Figure 7-4 System Running Information Overview (Image Only For Reference)

7.5. Query Data

- Step 1: Click [main menu icon](#)  on the upper right corner of the main interface;
 - Step 2: Click "[Data](#)" under main menu bar;
 - Step 3: Select corresponding sub-menu ([EMS/ AC/DC / MPPT / BMS data / Sys data / Alarm Info / Version Info](#)) as needed.
- END

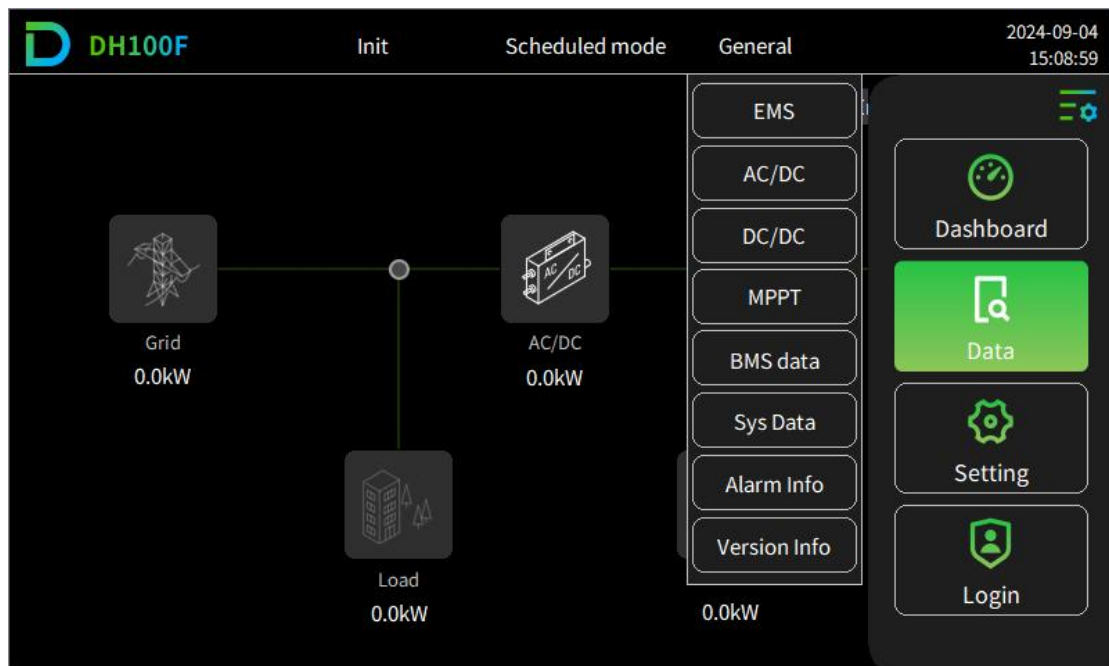


Figure 7-5 Query Data Diagram

7.6. EMS Setting

7.6.1. Run Setting

The operation setting interface is for setting the system setting and parameters.

- Step 1: Click main menu icon  on the upper right corner of the main interface;
- Step 2: Click "Setting" under main menu bar;
- Step 3: Click "EMS" under sub-menu bar;
- Step 4: Click "RunSet" at the upper left of navigation bar; Input related parameter value to complete setting.

--END

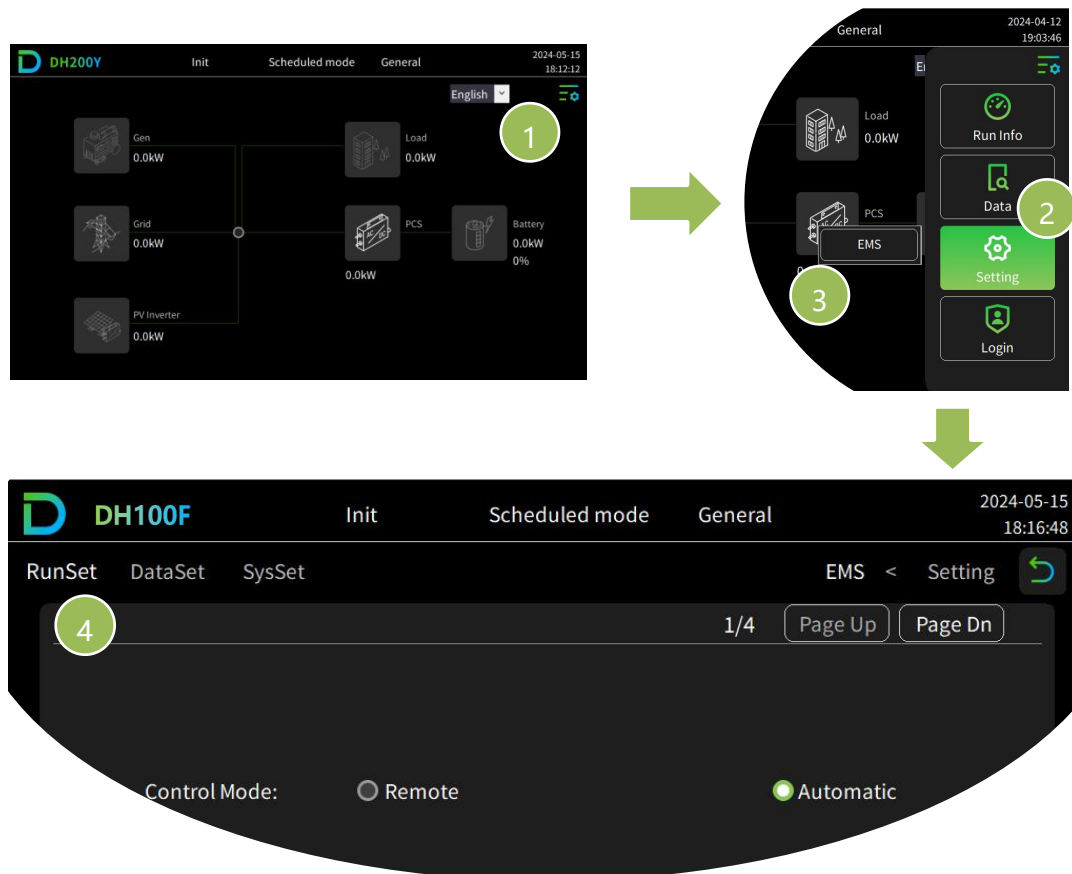


Figure 7-6 Running setting step

There are two control modes: remote and automatic

(1) Remote mode

System only accepts commands from external EMS which could control the system through the EMS of this product.

Set system parallel

When there are several products in parallel, need to set system parallel address and number of parallel.

Notice: 1 represents host, the other number represents slave.

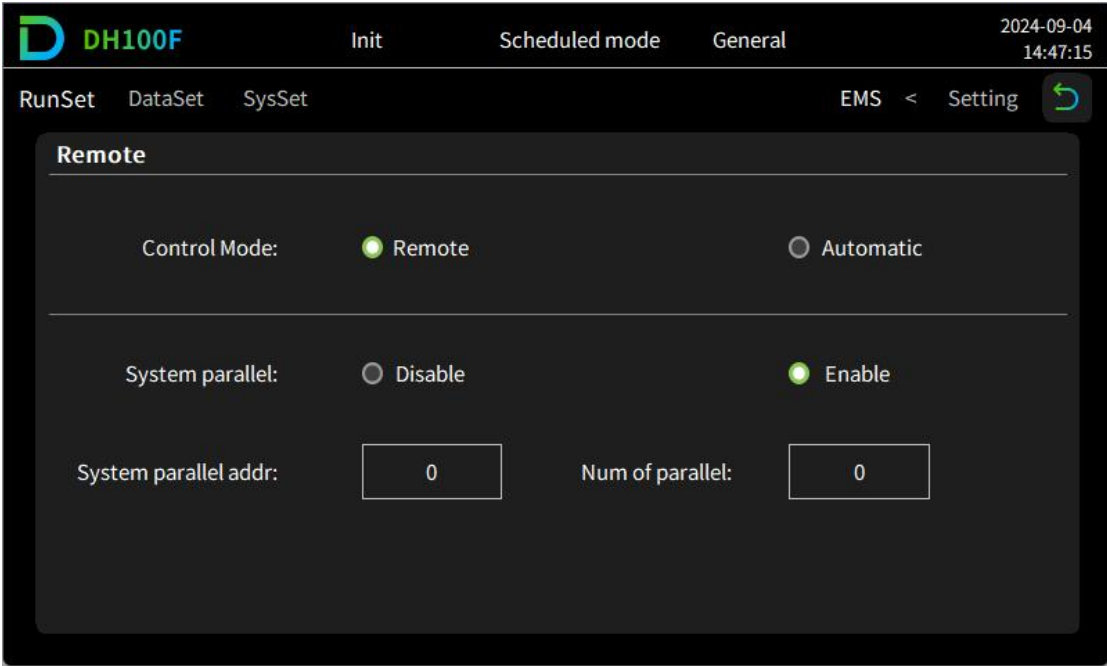


Figure 7-7 Remote Setting Step

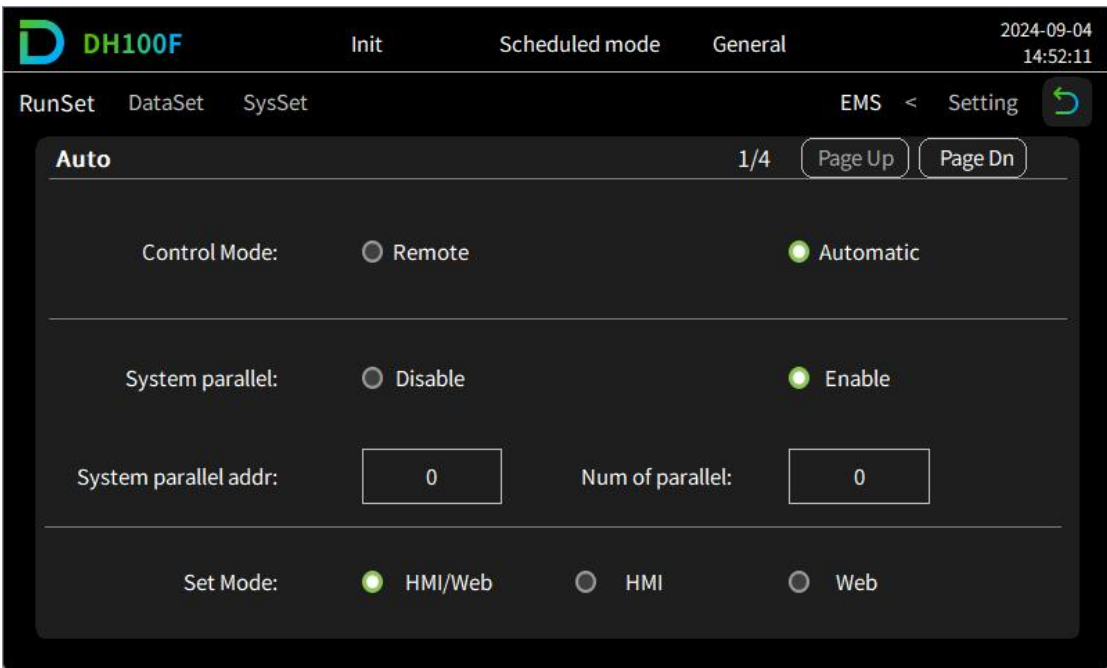
(2) Automatic mode

Set system parallel

When there are several products in parallel, need to set system parallel address and number of parallel (1 represents host, the other number represents slave). The host machine need to be set in the next step while the slave are free from next operations.

Set mode:

- HMI / Web: The system can be set up through the local HMI and Dyness cloud platforms;
- HMI: the system can only be set up through local HMI;
- Web: The system can only be set up through the Dyness cloud platform.



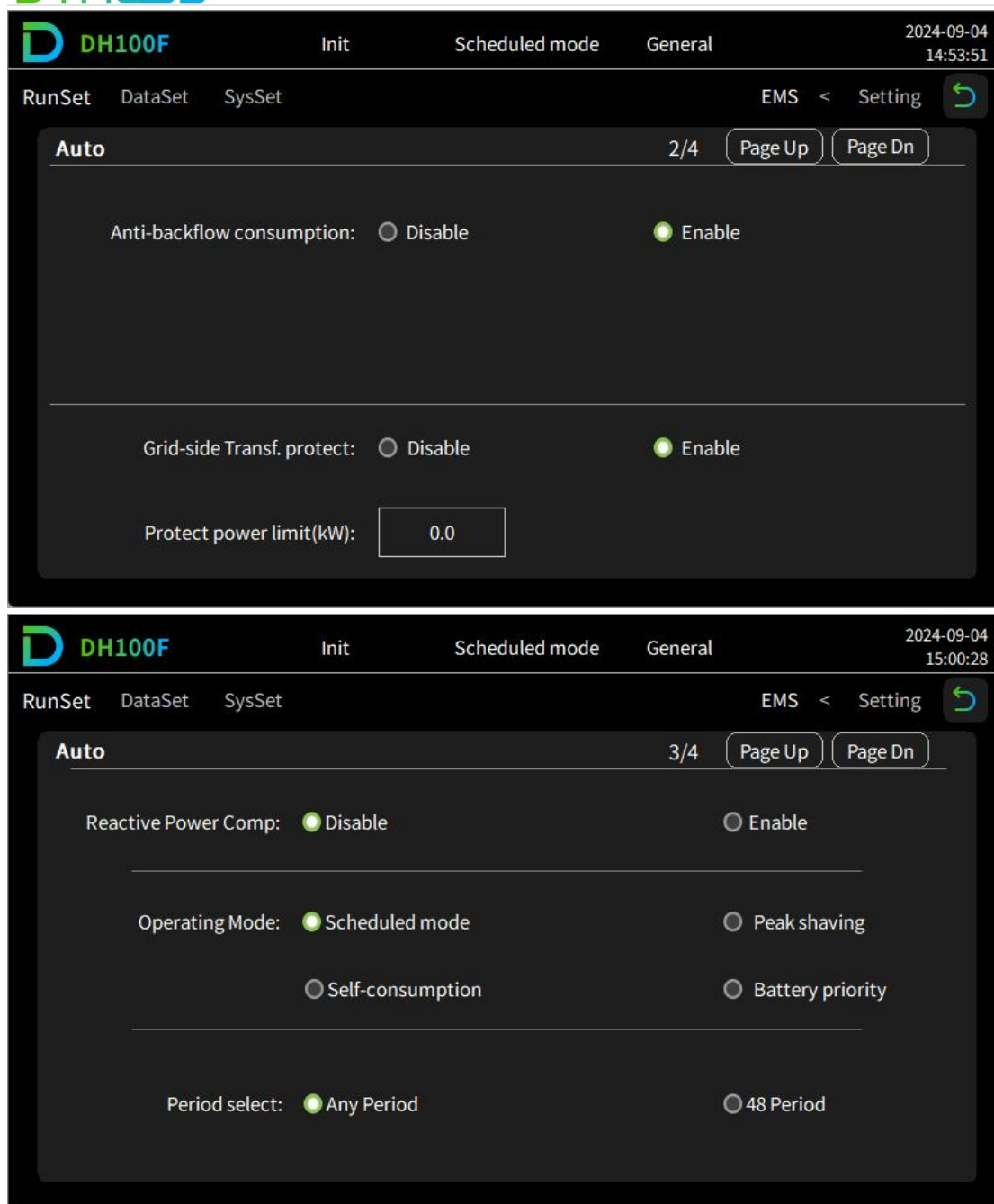


Figure 7-8 Automatic Setting Step(Total 3p)

Table 7-3 Automatic Mode Set

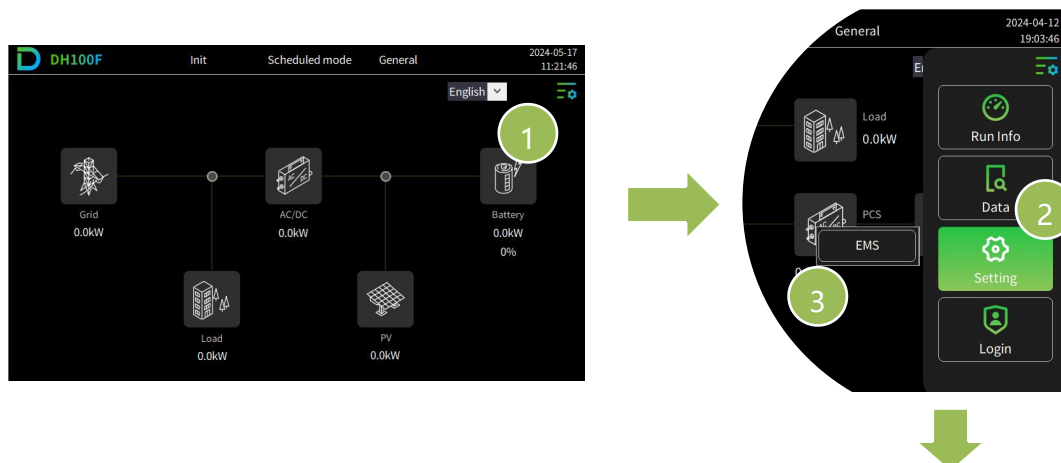
Item	Description
Anti-backflow	• Disable: the system has no limitation over PV output; • Enable: the system enables anti-backlow function to prevent PV output feed back to the grid.
Grid-side transformer powerprotect	If the load power exceeds the set demand power even with PV maximum output, the EMS will control the ESS system to discharge to reduce the excess power beyond the set demand power. • Disable: the system has no transformer protection control; • Enable: the system enables transformer protection function, and protect power limit value need to be set.

SOC settings	Perform SOC-related settings such as off-grid cutoff and PV inverter settings. Set SOC protection: • Disable: Do not use SOC protection. • Enable: Turn on SOC protection and set the maximum and minimum SOC limits.
Generator settings	After connecting the generator, control the generator charging status. Generator charging settings: • Off: Do not use the generator. • On: Set the generator operating conditions, such as SOC, power, and whether to start and stop automatically.
Reactive power compensation	Set system reactive compensation function. • Disable: the system won't compensate reactive power; • Enable: the system compensate reactive power.
Operating mode	• Scheduled mode: Scheduled mode (time segment) can be set. • Peak shaving: Sharp Peak power and Flat Valley power can be set. • Self-consumption: No setup required, PV supplies the load first, and when PV is insufficient, the battery supplements it, followed by power from the grid. • Battery priority: Hold SOC can be set, and it'll charge when the SOC drops below that level, but it won't charge if it's above that level.

7.6.2. Parameter Setting

Setting the relevant protection parameters of the ESS on parameter setting interface.

- Step 1: Click [main menu icon](#)  on the upper right corner of the main interface;
 - Step 2: Click [“Setting”](#) under main menu bar;
 - Step 3: Click [“EMS”](#) under sub-menu bar;
 - Step 4: Click [“DataSet”](#) at the upper left of navigation bar;
- END



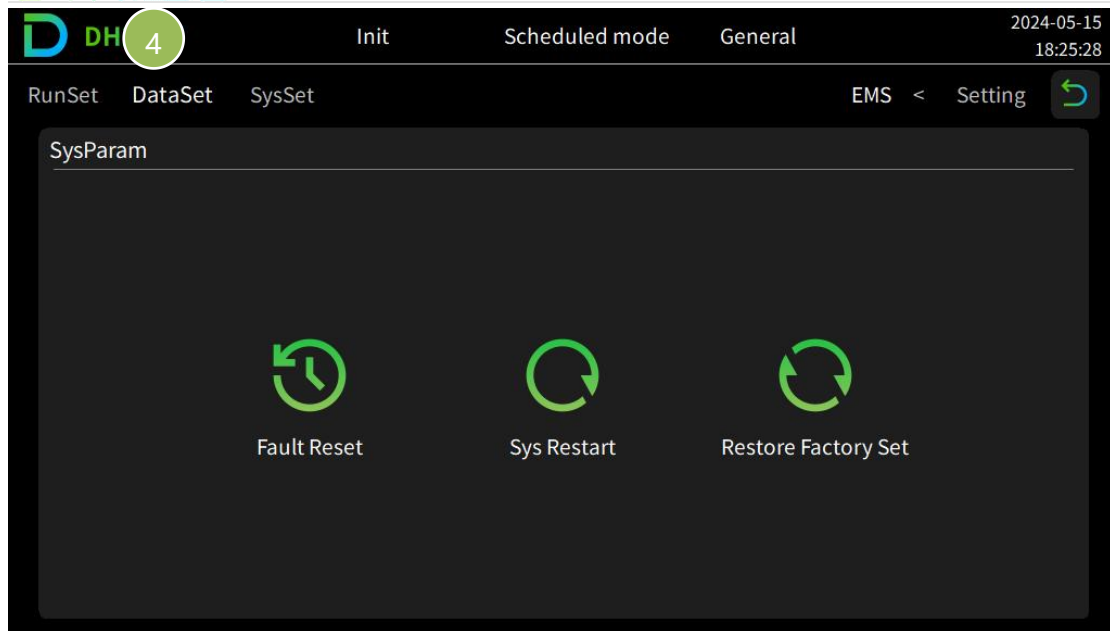


Figure 7-9 Parameter Setting Step

Table 7-4 System Control Description

Item	Description
Fault Reset	Reset for the system faults.
Sys Restart	Restart EMS (Notice: this operation is not possible when the system is running.
Restore factory Set	Safety regulation parameter, correction coefficient, power generation, no clear.

7.6.3. System Setting

Set HMI time/display format/language, EMS system time and etc.

- Step 1: Click [main menu icon](#)  on the upper right corner of the main interface;
- Step 2: Click ["Setting"](#) under main menu bar;
- Step 3: Click ["EMS"](#) under sub-menu bar;
- Step 4: Click ["SysSet"](#) at the upper navigation bar and input relevant parameters.

--END

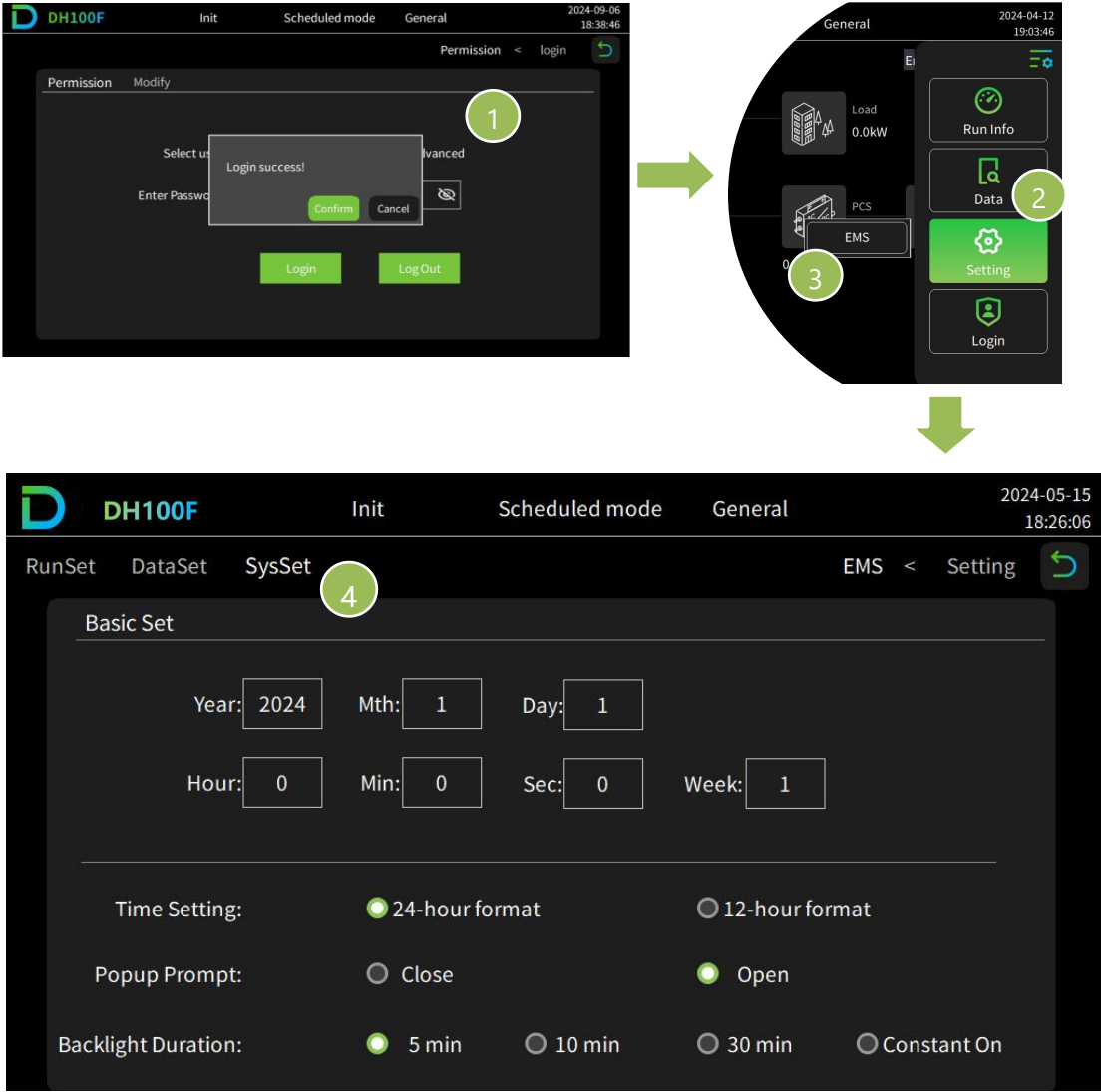


Figure 7-10 System Setting Step
Table 7-5 System Setting Description

Item	Description
HMI time	Set HMI display time
Time Setting	Set HMI display time system, 12-hour and 24-hour available
Popup prompt	Set HMI popup remind function, set to" open", reminder will popup when setting important parameters.
Backlight Duration	Set HMI backlight time.

7.7. Application Setting Step

7.7.1. Automatic Mode

1. Scheduled Mode

Step 1: Login (Install), password(1111).

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

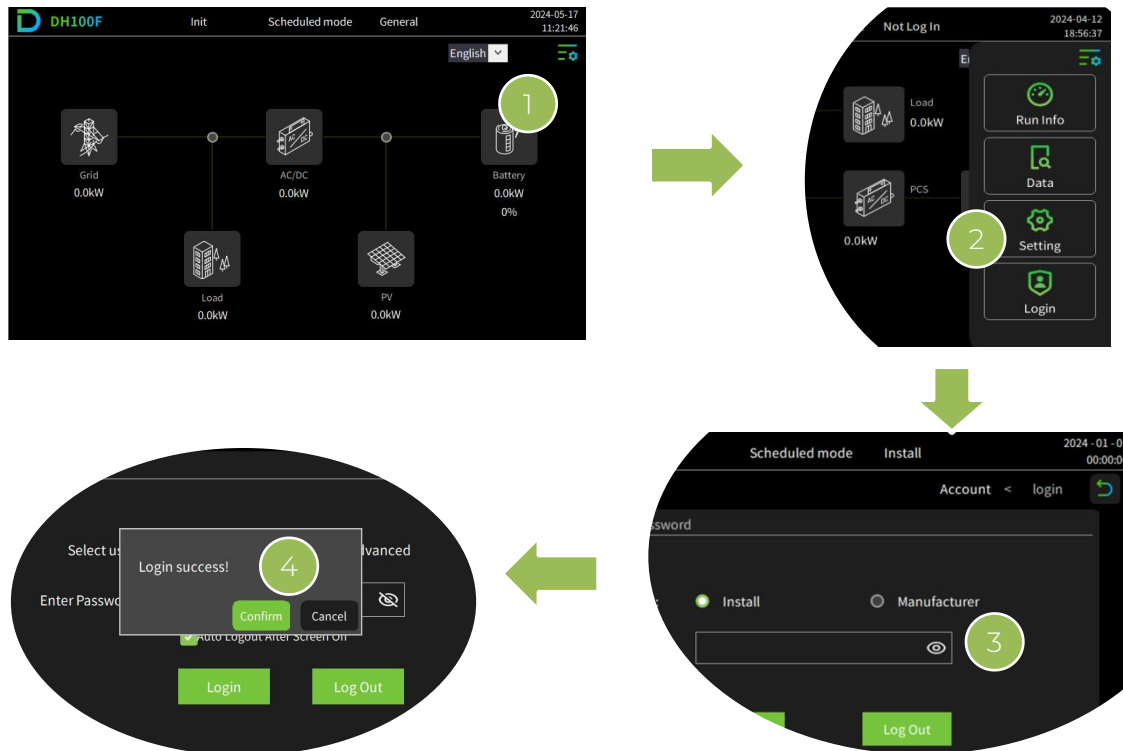


Figure 7-11 User Login Step

Step 2: Enter "Setting" interface

- (1) Click main menu icon  on the upper right corner of the main interface;
- (2) Click "Setting" under main menu bar;
- (3) Click "EMS" under sub-menu bar;
- (4) Click "RunSet" at the upper left of navigation bar;
- (5) On "1/4" page, set Control mode to "Automatic".

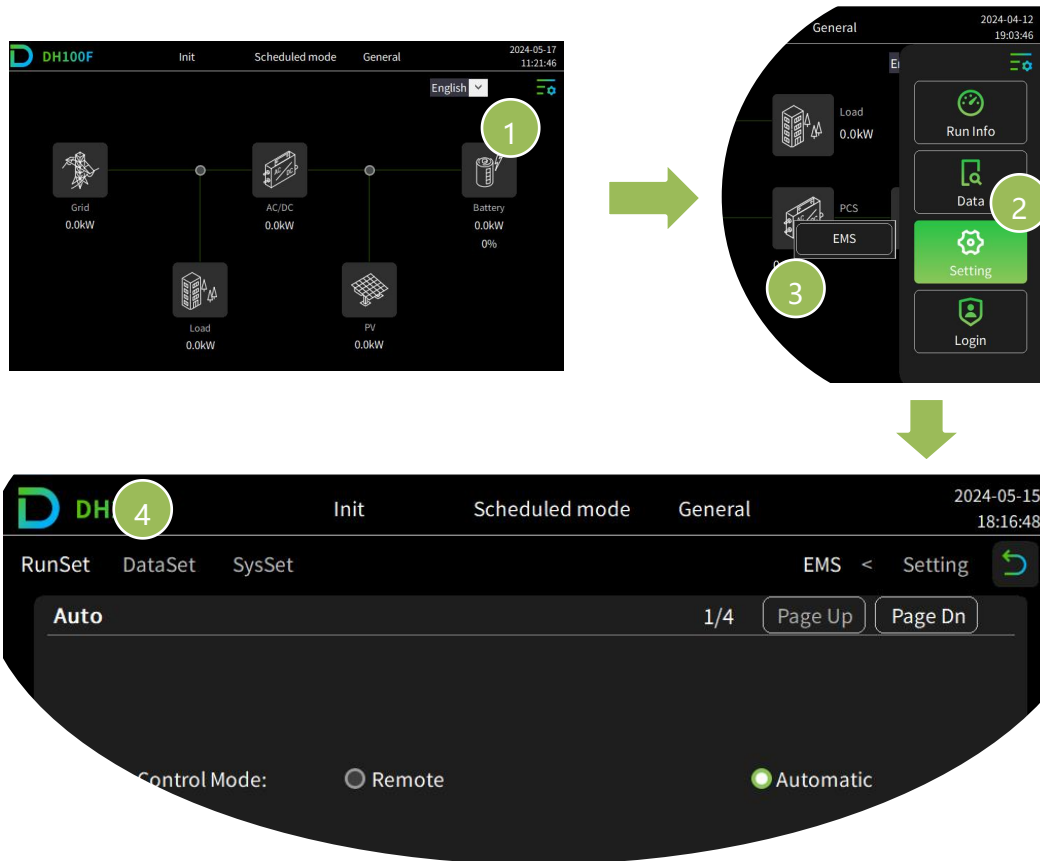


Figure 7-12 Run Setting Step

Step 3: Set Parallel and set method

- (1) Set **【System parallel】**: when there are multiple products in parallel, click **"enable"**, and set the parallel address and the number of parallel (1 means the host, other means the slave). The host needs to do the next operation while the slave is free from next operation); otherwise click **"Disable"**;
- (2) Set Mode: if select **"Web"**, the rest of the operations are carried out on the Dyness cloud platform, if select **"HMI / Web" or "HMI"**, click the next page.

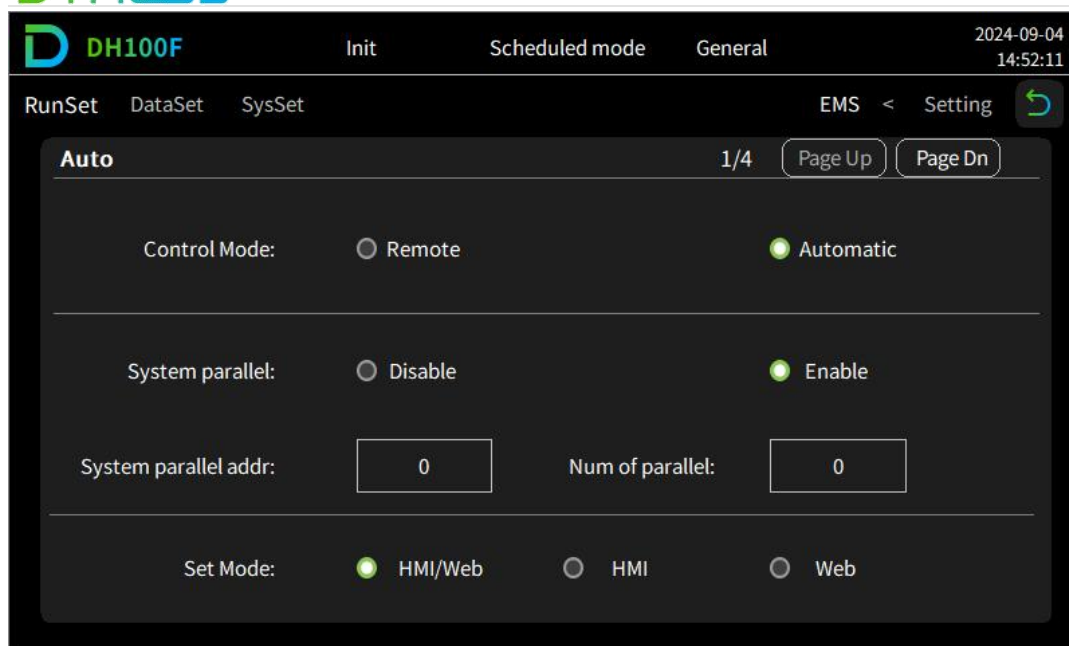
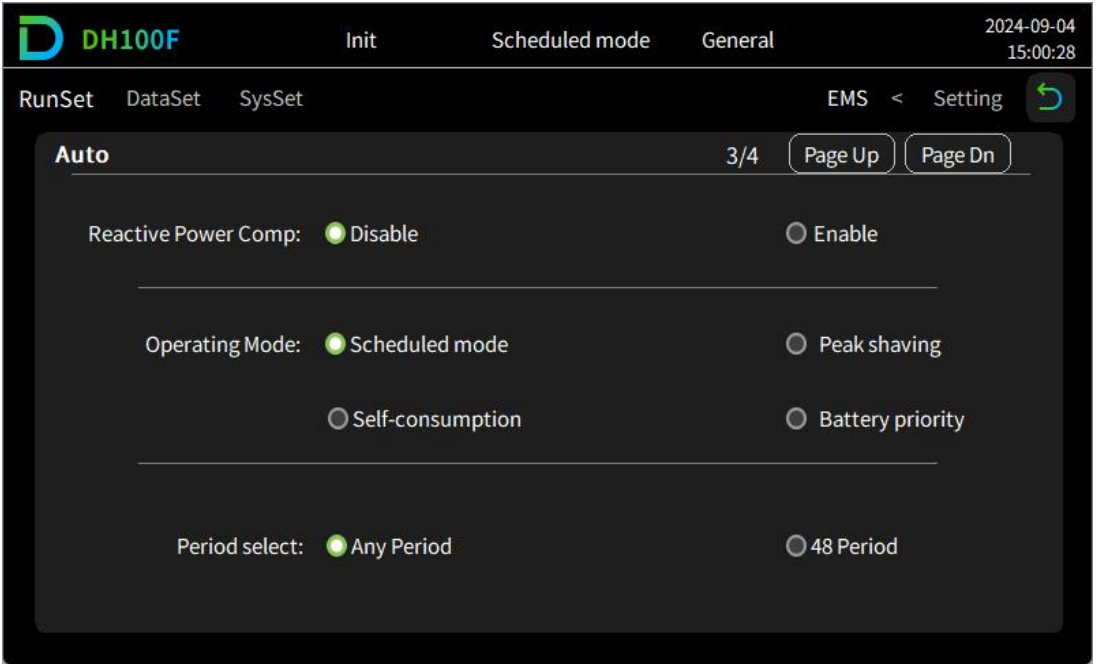
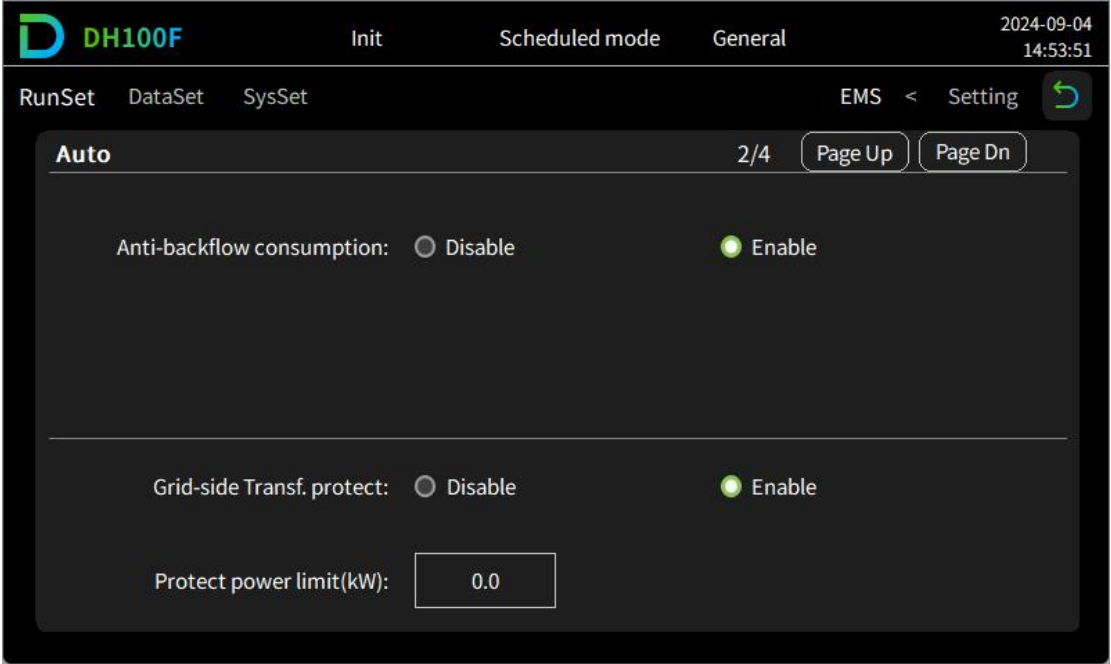


Figure 7-13 Parallel & Set Mode Step

Step 4: Set Scheduled mode

- (1) On "2/4" page, set **【Anti-backflow Compensation】**; Set **【Grid-side transf. Protect】**, set power value if click "enable";
 - (2) On "3/4" page, set **【Reactive Power Comp】**
 - (3) On "3/4" page, click **“Scheduled mode”**; and set to **“48 periods”**; or **“Any period”** based on projects requirements. then click **“Page On”** at the upper right corner;
 - (4) On "4/4" page, select the time period corresponding to each month (Period One/ Two/ Three/ Four) and S-P-F-V (Set 1/Set 2/Set 3/Set 4);
 - (5) Set start time and end time, corresponding power and SOC;
 - (6) Return to previous page, click **“S-P-F-V”**, setting the time table.
- END



Init

Scheduled mode

General

2024-09-06

18:41:17

RunSet

DataSet

SysSet

EMS < Setting

Auto

4/4

Page Up

Page Dn

January: 0

May: 0

September: 0

February: 0

June: 0

October: 0

March: 0

July: 0

November: 0

April: 0

August: 0

December: 0

Period Select:

Period One

Period Two

Period Three

Period Four

S-P-F-V:

Set 1

Set 2

Set 3

Set 4

Init

Scheduled mode

General

2024-09-04

15:03:06

RunSet

DataSet

SysSet

EMS < Setting

Auto

Any time period 1

Back

Done

Num	Start Time	End Time	Power(kW)	SOC(%)
1	00 : 00	00 : 00	00	0
2	00 : 00	00 : 00	00	0
3	00 : 00	00 : 00	00	0
4	00 : 00	00 : 00	00	0
5	00 : 00	00 : 00	00	0
6	00 : 00	00 : 00	00	0
7	00 : 00	00 : 00	00	0
8	00 : 00	00 : 00	00	0
9	00 : 00	00 : 00	00	0
10	00 : 00	00 : 00	00	0

Mon

Tue

Wed

Thur

Fri

Sat

Sun

SOC limit

Figure 7-14 Scheduled Mode Setting Step(Total 5p)

2. Peak-shaving

Step 1: Login (Install), password(1111). (Refer to 7.7.1 "1.Scheduled Mode" Step 1)

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

Step 2: Enter "setting" interface. (Refer to 7.7.1 "1.Scheduled Mode" Step 2)

- (1) Step 1: Click **main menu icon**  on the upper right corner of the main interface;
- (2) Step 2: Click "**Setting**" under main menu bar;
- (3) Step 3: Click "**EMS**" under sub-menu bar;
- (4) Step 4: Click "**RunSet**" at the upper left of navigation bar;

Step 3: Set Parallel and set method. (Refer to 7.7.1 "1.Scheduled Mode" Step 3)

- (1) On "**1/4**" page, set **Control mode** to "**Automatic**";
- (2) Set **System parallel**: when there are multiple products in parallel, click "**enable**", and set the parallel address and the number of parallel (1 means the host, other means the slave). The host needs to do the next operation while the slave is free from next operation); otherwise click "**Disable**";
- (3) Set Mode: if select "**Web**", the rest of the operations are carried out on the Dyness cloud platform, if select "**HMI / Web**" or "**HMI**", click the next page;

Step 4: Set to "Peak shaving mode".

- (1) On "2/4" page, set **【Anti-backflow】**; Set **【Grid-side transf. Protect】**, set power value if click "enable";
 - (2) On "3/4" page, set **【Reactive Power Compensation】**;
 - (3) On "3/4" page, set **【Operating mode】** to "Peak-shaving";
 - (4) Set **【Peak power (kW)】** and **【Valley power (kW)】**.
- END

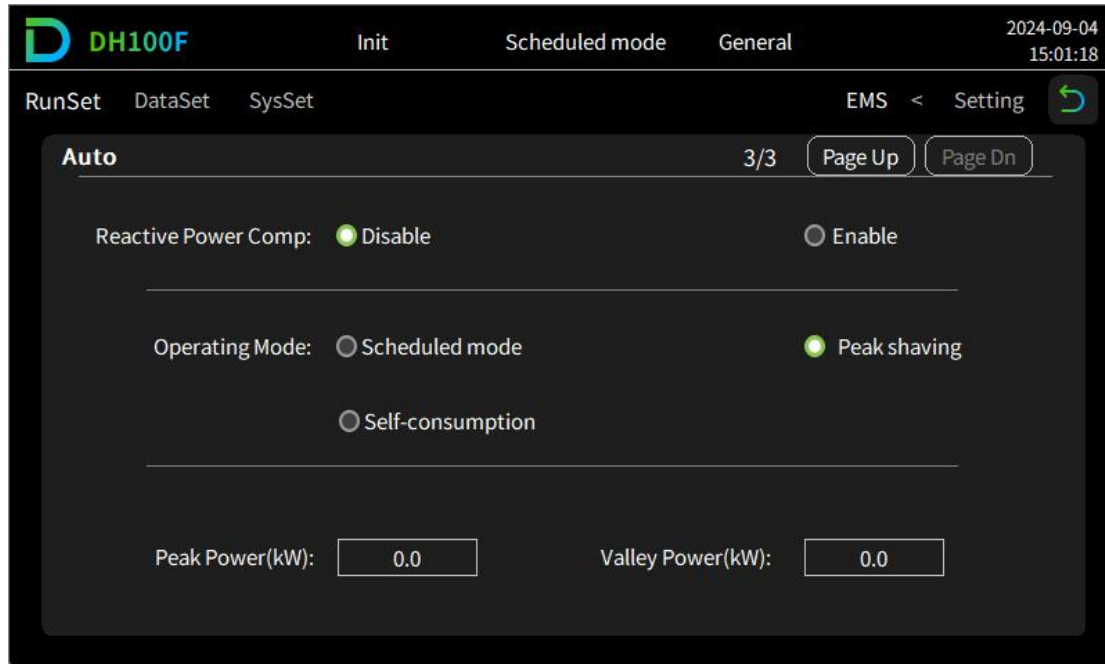


Figure 7-15 Peak-shaving Setting Step

3. Self-consumption

Step 1: Login (Install), password(1111). (Refer to 7.7.1 "1.Scheduled Mode" Step 1)

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

Step 2: Enter “setting”interface. (Refer to 7.7.1 "1.Scheduled Mode" Step 2)

- (1) Click **main menu icon**  on the upper right corner of the main interface;
- (2) Click **“Setting”** under main menu bar;
- (3) Click **“EMS”** under sub-menu bar;
- (4) Click **“RunSet”** at the upper left of navigation bar;

Step 3: Set Parallel and set method. (Refer to 7.7.1 "1.Scheduled Mode" Step 3)

- (1) On "1/4" page, set **【Control mode】** to **“Automatic”**;
- (2) Set **【System parallel】**: when there are multiple products in parallel, click **“enable”**, and set the parallel address and the number of parallel (1 means

- the host, other means the slave). The host needs to do the next operation while the slave is free from next operation); otherwise click "[Disable](#)";
- (3) Set Mode: if select "[Web](#)", the rest of the operations are carried out on the Dyness cloud platform, if select "[HMI / Web](#)" or "[HMI](#)", click the next page.

Step 4: Set to "Self-consumption mode".

- (1) On "2/4" page, set [【Anti-backflow】](#); Set [【Grid-side transf. Protect】](#), set power value if click "enable";
- (2) On "3/4" page, set [【Reactive Power Compensation】](#);
- (3) On "3/4" page, set [【Operating mode】](#) to "Self-consumption".

——END

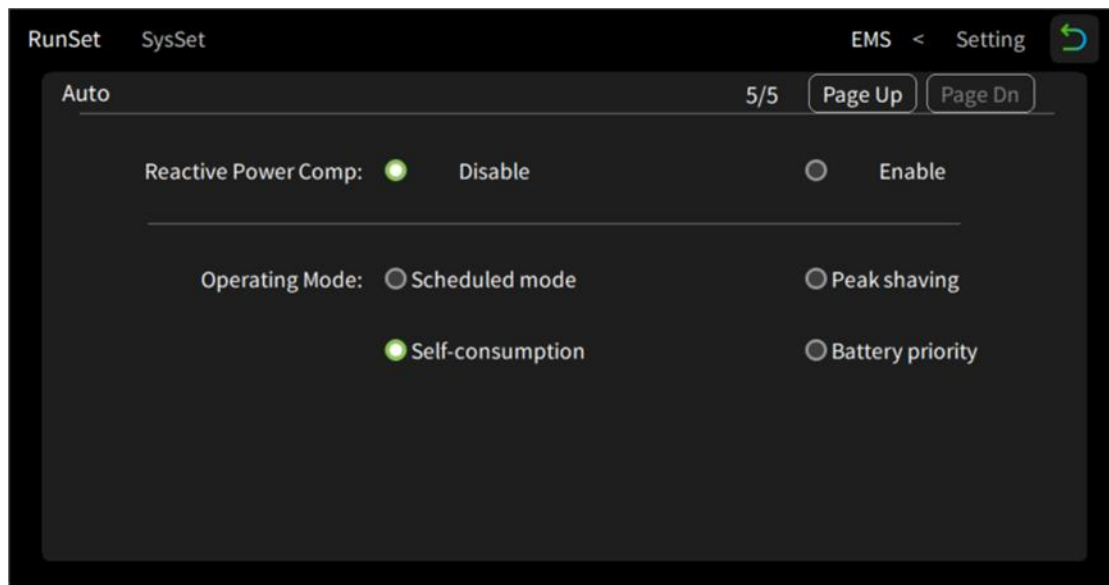


Figure 7-16 Self-consumption Setting Step

4. Battery priority

- Step 1: On the "[Auto](#)" interface page "5/5", set the [\[Operating Mode\]](#) to "[Battery Priority](#)";
- Step 2: Set the value for "[Hold SOC](#)", when the value falls below this setting, the device will prioritize charging.

——END

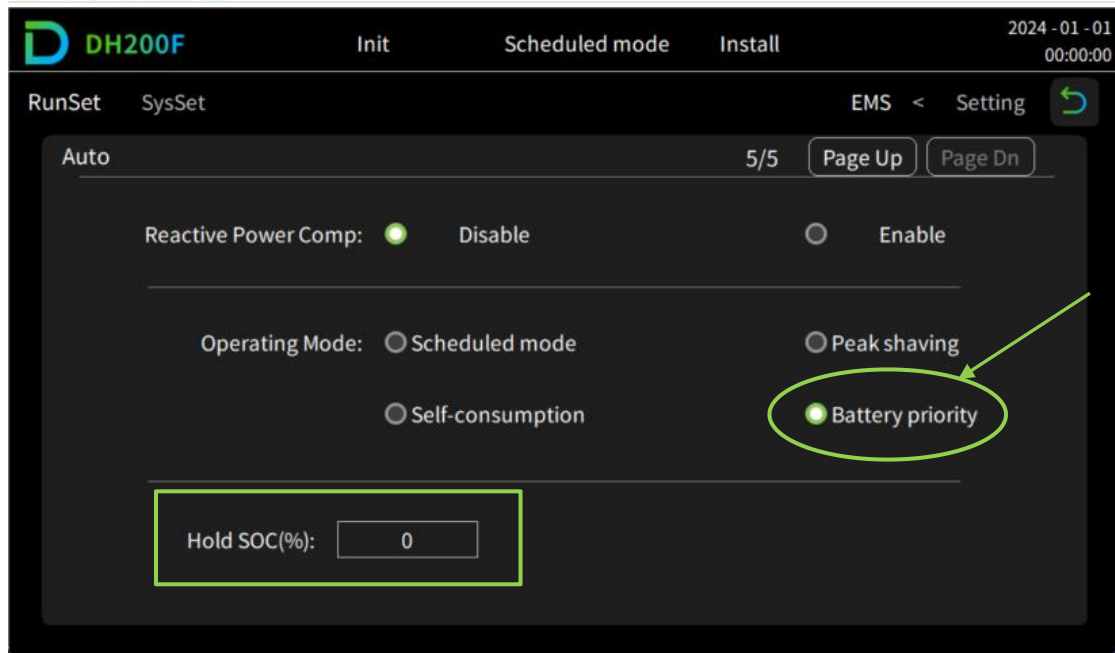


Figure 7-17 Battery Priority Setting Step

7.7.2. Remote Mode

Step 1: Login (Install), password(1111). (Refer to 7.3 "User Login")

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

Step 2: Enter "setting" interface (Refer to 7.6 "EMS Setting")

- (1) Click main menu icon  on the upper right corner of the main interface;
- (2) Click "Setting" under main menu bar;
- (3) Click "EMS" under sub-menu bar;
- (4) Click "RunSet" at the upper left of navigation bar.

Step 3: Set Remote mode

- (1) Set 【Control mode】 to "Remote";
- (2) Set 【System parallel】: when there are multiple products in parallel, click "enable", and set the parallel address and the number of parallel (1 means the host, other means the slave). The host needs to do the next operation while the slave is free from next operation); otherwise click "Disable".

——END

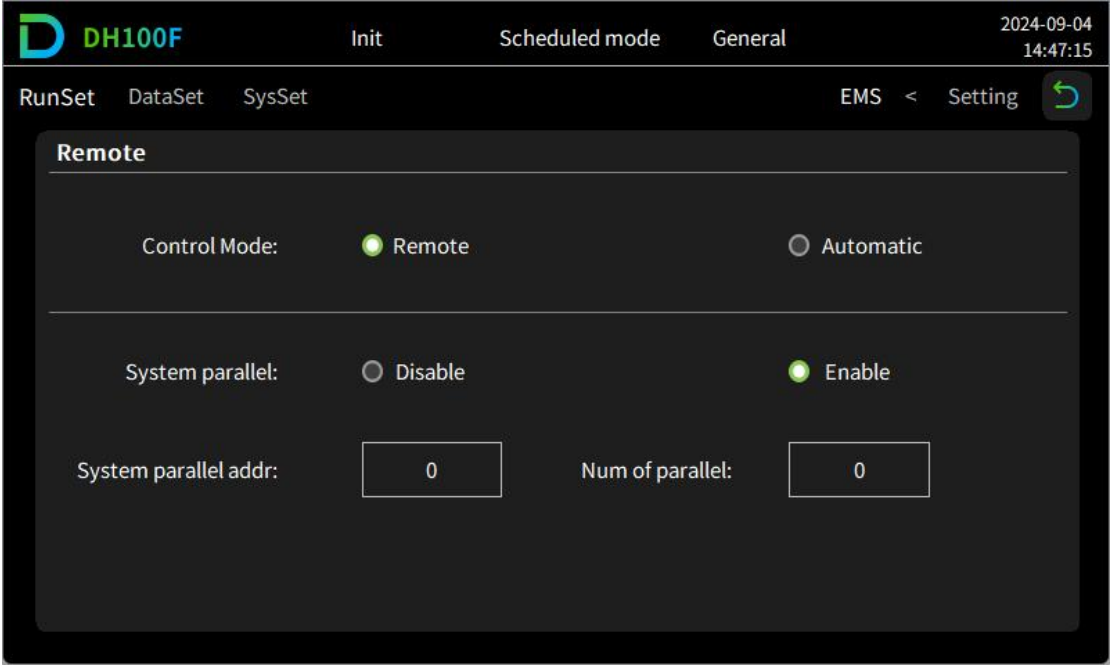
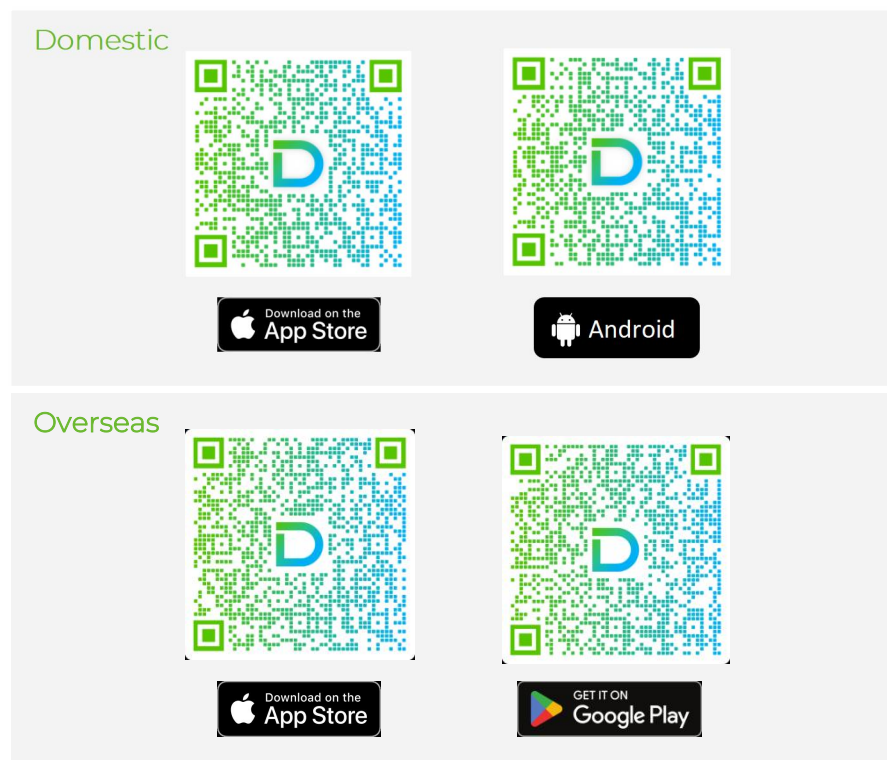


Figure 7-18 Remote Mode Setting Step

7.8. Cloud Platform

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

APP



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 cover most countries around the world. If you need to obtain the correspondence between sites and countries, please contact Dyness.

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 the supplier.
Show access alarm	Check if 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.
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/WIFI/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 gird 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.
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 are 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.	
Wiring and cable arrangement	Check if there are any oxidation or rust inside the ESS cabinet;	Once/year
	Check if the ESS cabinet and internal equipment are damaged or deformed.	
	Check if all the inlet/outlet of the ESS cabinet are sealed properly;	
	Check if there are any water leakage inside the ESS cabinet;	
	Check if the power cables are loose, tighten them according to previously specified torque;	

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

and insulation parameter).

10. Quality Assurance

Warranty period please refer to “Technical Agreement” and “Warranty Agreement”

Service within warranty period: for Dyness ESS products that fail within warranty period, we will be responsible for handling and providing proper replacement or repair solution, 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 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 “Warranty Agreement” or “Technical Agreement”, or damage caused by abnormal natural environmental factors;
- Damage or failure caused by installation, modification and disassembly from 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 customer require.

If you have any problems about 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.

11. Appendix

Please check if the following checklist have been completed before 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 ESS cabinet and components are clear or damaged	☐
4	Check if the grid AC cables are connected in correct phase sequence	☐
5	Check if the PV cables are connected in correct phase sequence	
6	Check if the communication cable connection is completed	☐
7	Check if there are any faults of PE cable	☐
8	Check if the liquid cooling pipes are well connected and check if there are any leakage	☐
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 situation of manual components	☐
12	Check if the circuit breakers 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 fan and air conditioner is running well and no abnormal sound	
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 ESS cabinet could 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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