



ACHub Series

User Manual

Notice

This manual contains important safety instructions, installation, electrical connections, commissioning, maintenance, and troubleshooting of the equipment.

Save the manual!

This manual must be stored carefully and be available at all times.

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Content

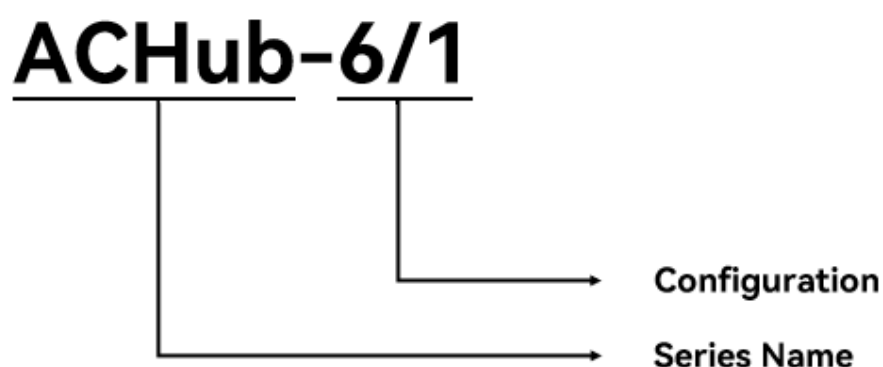
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About This Manual

Overview

Please read the product manual carefully before installation, operation, or maintenance of the ACHub Series. This manual contains important safety instructions and installation instructions that must be followed during installation and maintenance of the equipment.

Designation explanation of the ACHub Series:



No.	Meaning	Description
1	Series Name	ACHub: AC Combiner Hub for PowerHill
2	Configuration	6/1: 6 Inputs and 1 Output 4/1: 4 Inputs and 1 Output 2/1: 2 Inputs and 1 Output

Intended Audience

This manual is intended for technical professionals for installation, commissioning and maintenance of the product. The technical personnel have to be familiar with the product, local standards, and electric systems.

Symbol Conventions

The following types of safety instructions and general information appear in this document as described below:

Symbol	Description
 DANGER!	'Danger' indicates a hazard with a high level of risk that, if not avoided, will result in death or serious injury.
 WARNING!	'Warning' indicates a hazard with a medium level of risk that, if not avoided, will result in death or serious injury.
 CAUTION!	'Caution' indicates a hazard with a low level of risk that, if not avoided, could result in minor or moderate injury.
NOTICE NOTICE!	'Notice' indicates a situation that, if not avoided, could result in equipment or property damage.
 NOTE!	'Note' provides tips that are valuable for the optimal operation of the product.

Change History

Changes between document issues are cumulative. The latest document issue contains all the changes made in earlier issues.

Issue 01 (2025-3-19)

This issue is used for first application

1 Safety Information

1.1 Statement

The ACHub has been designed and tested strictly according to international safety regulations. Read all safety instructions carefully prior to any work and always observe them when working on or with the ACHub. Incorrect operation or work may cause:

- Injury or death to the operator or a third party.
- Damage to the inverter or other properties.

1.2 General Requirements

- Do not stop protective devices. Pay attention to the warnings, cautions, and related precautionary measures in this document and on the equipment.
- If there is a likelihood of personal injury or equipment damage during operations, immediately stop, report the case to the supervisor, and take feasible protective measures.
- Do not power on the equipment before it is installed or confirmed by professionals.
- Do not touch the power supply equipment directly or with conductors such as damp objects. Before touching any conductor surface or terminal, measure the voltage at the contact point to ensure that there is no risk of electric shock.
- Do not touch operating equipment because the enclosure is hot.
- Do not touch a running fan with your hands, components, screws, tools, or boards. Otherwise, personal injury or equipment damage may occur.

- In the case of a fire, immediately leave the building or the equipment area and activate the fire alarm or call emergency services. Do not enter the affected building or equipment area under any circumstances.

1.3 Electrical Safety

- Before commissioning and switching off the disconnecting circuit breaker, all basic information and step-by-step instructions must be understood and the safety instructions for the installation must be strictly adhered to.
- Do not change the size or rating of the fuse.
- When the device is connected to a power source, a safety officer must be appointed to ensure that the disconnected switch is not closed during maintenance.
- During the wiring process, two or more operators are not allowed to connect a wire at the same time.

1.4 Operation Safety

Requirements of operator

- Appropriate measuring devices must be used and the relevant standards and instructions must be followed. The operating manual of the measuring device must be known before measurements are carried out.
- Operators should wear work clothes and protective gear and have special tools in accordance with local laws and regulations.



NOTE!

Electrical operation

- Before commissioning and switching off the disconnecting circuit-breaker, it is important that all basic information and step-by-step instructions are understood and that the safety instructions for the installation are strictly adhered to.
- Do not change the size or rating of the fuse.
- When equipment is connected to a powered location, a safety officer shall be designated to ensure that switches that are disconnected during maintenance are not closed.
- Do not allow two or more operators to connect a wire at the same time during the wiring process.

Installation and operation instructions

- Do not switch on the device during operation.
- During installation, each completed item must be inspected once and cross-checking is required.
- The equipment must be installed in sequence and no steps should be skipped.
- An isolation zone must be installed to prevent uninvolved personnel from entering the site.
- Do not damage or lose the nameplate.
- Cabinet doors must not be opened in rainy weather.

Remarks

- The software, housing and components of the device may not be changed without authorization from the manufacturer. If the software, housing and components of the device are changed, the corresponding liability and warranty will be void.
- All operations of the energy storage system should follow the instructions in the User Manual. Damage to the equipment caused by violation of these instructions will result in liability and voiding of the warranty.

2 Product Overview

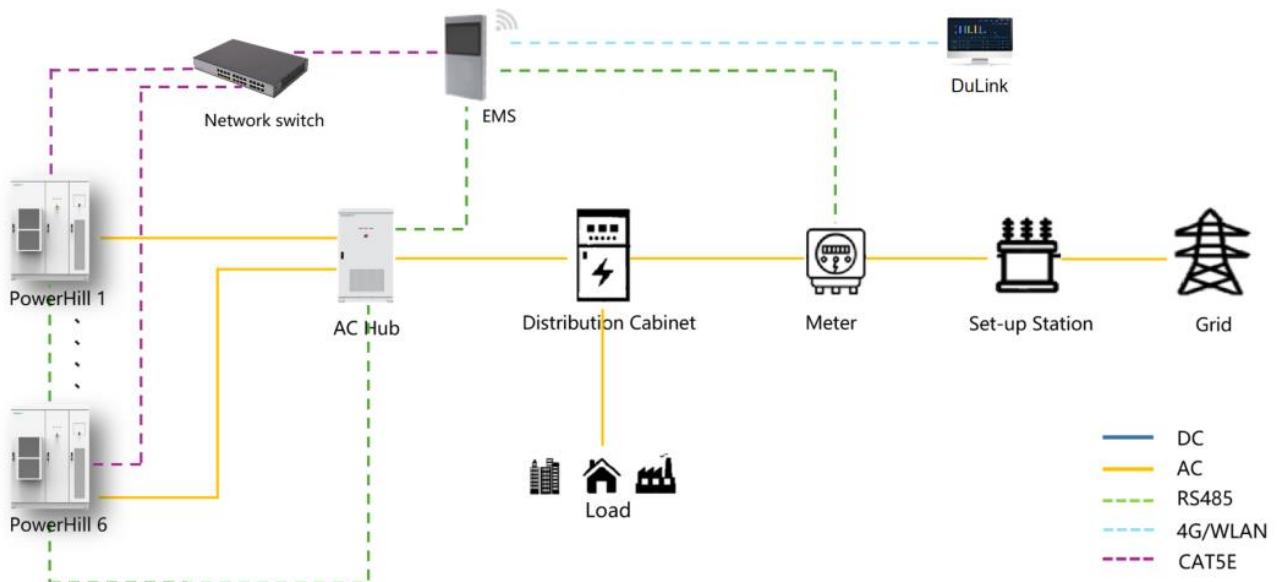
2.1 System Introduction

ACHub is an intelligent AC power distribution cabinet for current convergence and centralized control of multiple energy storage cabinets PowerHill, which meets the requirements for outdoor installation.

The application topology of the system is as follows:

ACHub centrally manages 6 PowerHills.

Figure 2-1 Connection schematic between ACHub and PowerHill



2.2 ACHub Configuration

Table 2-1 ACHub configurations

Series	Model	Configuration
ACHub	ACHub-6/1	The ACHub has a maximum power of 720kW and can be connected to six 100kW PowerHills or twelve 60kW PowerHills.
	ACHub-4/1	The ACHub has a maximum power of 480kW and can be connected to four 100kW PowerHills or six 60kW PowerHills.
	ACHub-2/1	The ACHub has a maximum power of 240kW and can be connected to two 100kW PowerHills or four 60kW PowerHills.

2.3 Appearance Dimensions

The appearance dimensions of the energy storage convergence cabinet are as follows:

Figure 2-2 ACHub front view (left), back view (right), top view (bottom)

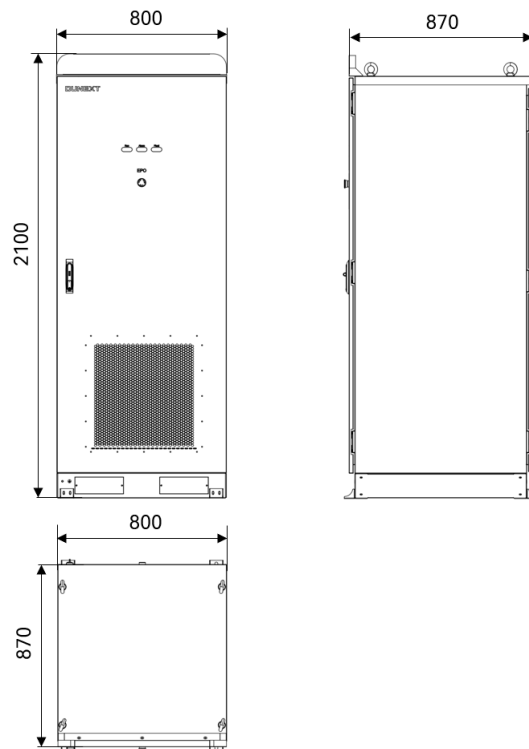
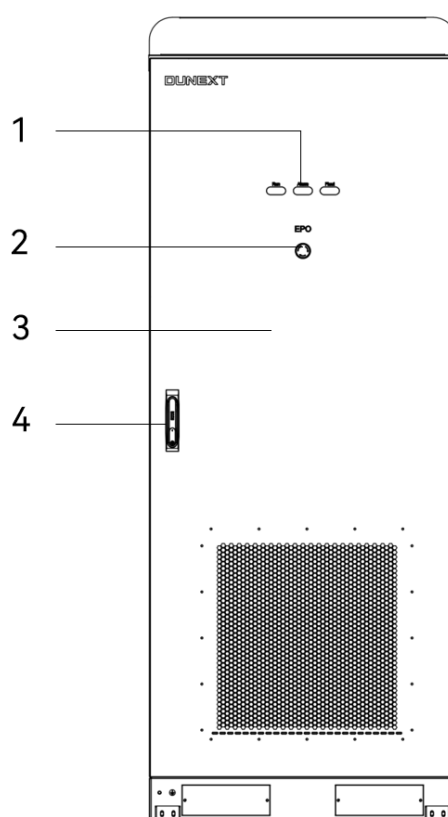


Table 2-2 Cabinet size chart

Name	W (mm)	D (mm)	H (mm)	Weight (kg)
ACHub	800	870	2100	About 400

2.4 Internal Components

The exterior and interior components of ACHub are as follows:

Figure 2-3 ACHub front view

Table 2-3 ACHub front view

Item	Name	Function
1	Indicator light	The green colour is always on to indicate operation, flashing to indicate standby, the yellow colour is always on to indicate that there is an alarm in the system but it does not affect the operation of the system, and the red colour is always on to indicate that there is a fault in the

Item	Name	Function
		system and the system stops running.
2	Emergency stop	The system stops when the button is pressed
3	Cabinet	ACHub cabinet
4	Door locks	Lock the cabinet door tightly and require a specific key to open it



NOTE!

Do not operate the emergency stop button in non-emergency situations.

Figure 2-4 ACHub back view

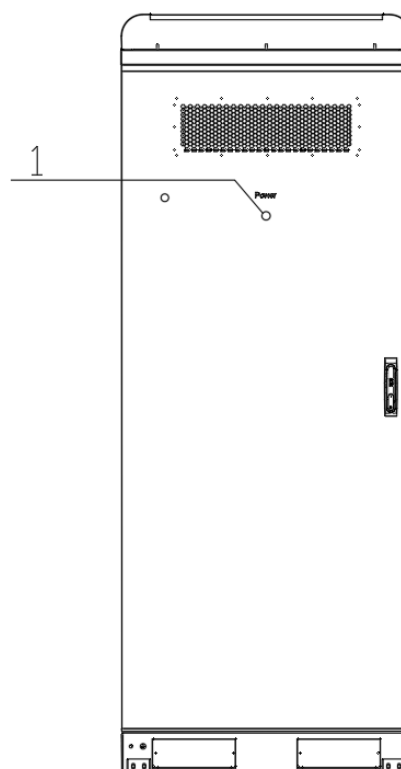


Table 2-4 ACHub back view

Item	Name	Function
1	Rear door indicator light	Red indicator light, lights up to indicate power to the grid

Figure 2-5 ACHub front view interior illustration

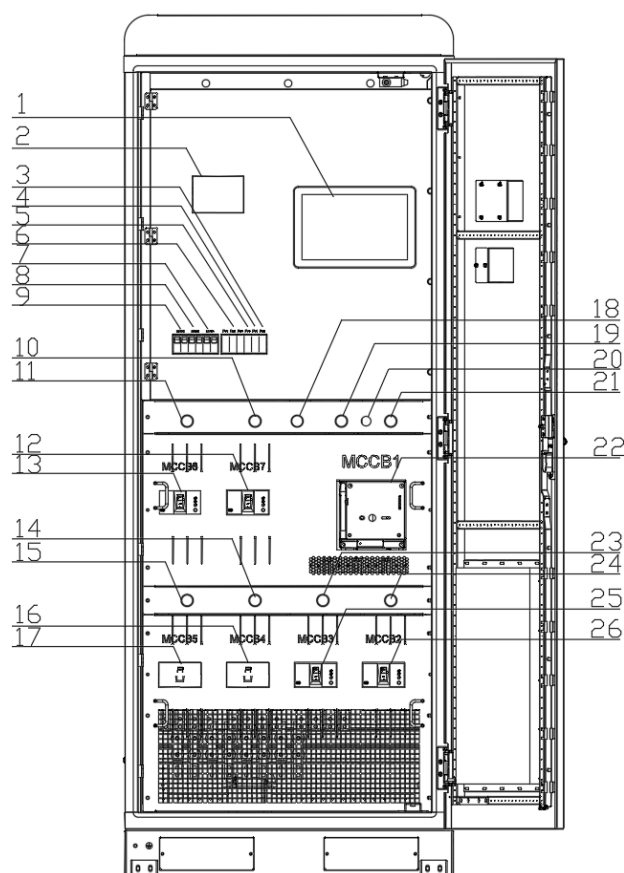


Table 2-5 ACHub front view interior illustration

Item	Name	Function	Remarks
1	EMS	Energy management system	
2	Billing meter	Electricity recording for the energy storage system	Optional
3	DC fuses FU6	Short circuit protection for backup battery (power supply for EMS)	
4	AC fuses FU5	Switching power supply input overcurrent protection	
5	AC fuses FU4	Fan short circuit protection	
6	AC fuses FU1~3	Meter voltage sampling overcurrent protection	
7	DC micro break MCB3	DC24V power switch	
8	AC micro break MCB2	AC220V power switch	

Item	Name	Function	Remarks
9	AC micro break MCB1	AC220V power switch	
10	Red running indicator	For displaying the MCCB7 circuit breaker closing status	A bright light indicates that the circuit breaker has been closed, while a non-bright light indicates that it has not been closed.
11	Red running indicator	For displaying the MCCB6 circuit breaker closing status	A bright light indicates that the circuit breaker has been closed, while a non-bright light indicates that it has not been closed.
12	Earth leakage circuit breaker MCCB7	Leakage overcurrent protection for access to energy storage cabinets	
13	Earth leakage circuit breaker MCCB6	Leakage overcurrent protection for access to energy storage cabinets	
14	Red running indicator	For displaying the MCCB4 circuit breaker closing status	A bright light indicates that the circuit breaker has been closed, while a non-bright light indicates that it has not been closed.
15	Red running indicator	For displaying the MCCB5 circuit breaker closing status	A bright light indicates that the circuit breaker has been closed, while a non-bright light indicates that it has not been closed.
16	Earth leakage circuit breaker MCCB4	Leakage overcurrent protection for access to energy storage cabinets	
17	Earth leakage circuit breaker MCCB5	Leakage overcurrent protection for access to energy storage cabinets	
18	24V power activation switch	For off-grid forced start 24V supply	Optional
19	Indicator lamps for tripping	Green light, used to indicate the main circuit breaker opening status	
20	Switching knob	Reset knob, turn to the right to close the MCCB1 circuit breaker, turn to the left to open the MCCB1 circuit breaker	
21	Closing indicator	Red light, used to indicate the main breaker closing status	

Item	Name	Function	Remarks
22	Main breaker MCCB1	Grid access to main switch, lower end to MCCB2~MCCB7 branch circuit breaker	
23	Red running indicator	For displaying the MCCB3 circuit breaker closing status	A bright light indicates that the circuit breaker has been closed, while a non-bright light indicates that it has not been closed.
24	Red running indicator	For displaying the MCCB2 circuit breaker closing status	A bright light indicates that the circuit breaker has been closed, while a non-bright light indicates that it has not been closed.
25	Earth leakage circuit breaker MCCB3	Leakage overcurrent protection for access to energy storage cabinets	
26	Earth leakage circuit breaker MCCB2	Leakage overcurrent protection for access to energy storage cabinets	

Figure 2-6 ACHub internal illustration on the back

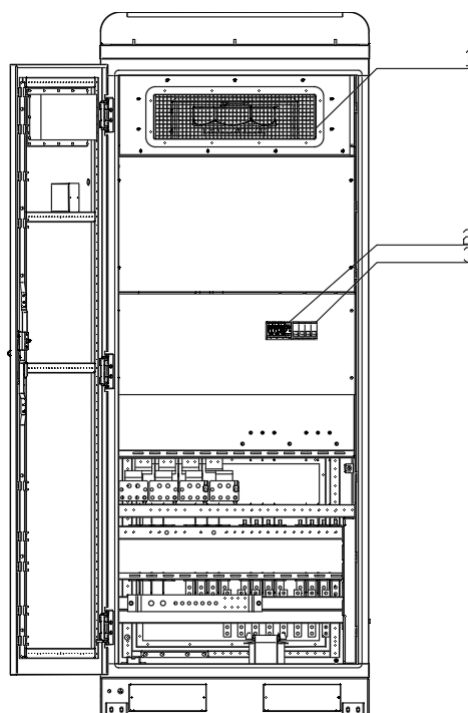
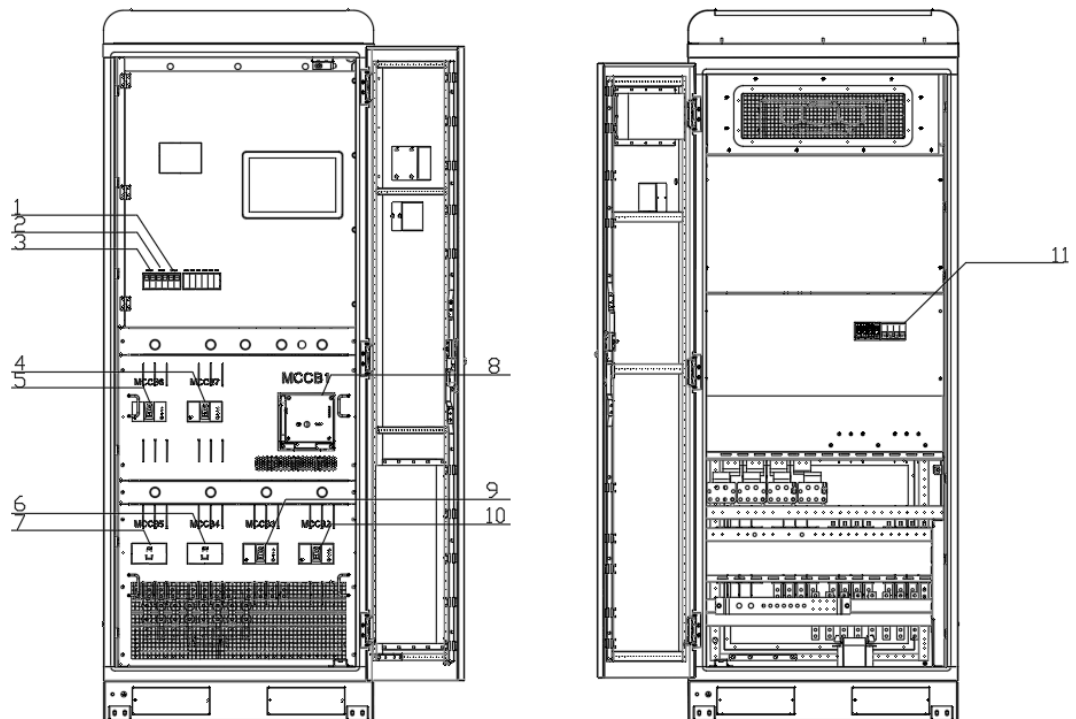


Table 2-6 ACHub internal illustration on the back

Item	Name	Function
1	Centrifugal fan	Forced cooling after reaching the set temperature
2	AC surge protector	Protecting the AC side of the line
3	Breaker	AC surge protector backup protection

All switches of ACHub are shown in the figure below:

Figure 2-7 ACHub circuit breaker

Table 2-7 ACHub circuit breaker

No.	Item	Description	Remarks
1	DC micro-breaker MCB3	DC24V power switch	The power grid connection must be in OFF state
2	AC micro-breaker MCB2	AC220V power switch	The power grid connection must be in OFF state
3	AC micro-breaker MCB1	AC220V power switch	The power grid connection must be in OFF state

No.	Item	Description	Remarks
4	Leakage circuit breaker MCCB7	Used for leakage overcurrent protection of energy storage cabinet	The power grid connection must be in OFF state
5	Leakage circuit breaker MCCB6	Used for leakage overcurrent protection of energy storage cabinet	The power grid connection must be in OFF state
6	Leakage circuit breaker MCCB4	Used for leakage overcurrent protection of energy storage cabinet	The power grid connection must be in OFF state
7	Leakage circuit breaker MCCB5	Used for leakage overcurrent protection of energy storage cabinet	The power grid connection must be in OFF state
8	Main circuit breaker MCCB1	The grid is connected to the main switch, and the lower end is connected to the MCCB2~MCCB7 branch circuit breakers	The power grid connection must be in OFF state
9	Leakage circuit breaker MCCB3	Used for leakage overcurrent protection of energy storage cabinet	The power grid connection must be in OFF state
10	Leakage circuit breaker MCCB2	Used for leakage overcurrent protection of energy storage cabinet	The power grid connection must be in OFF state
11	Surge protector switch	AC lightning arrester backup protection	The power grid connection must be in OFF state

2.5 Specifications

The detailed parameters of ACHub are shown in the table below:

Table 2-8 Detailed parameters of ACHub

Item	ACHub-6/1	ACHub-4/1	ACHub-2/1
Grid type	3P4W		
Charge and discharge power (KW)	600	400	200
Energy storage cabinet interface	6	4	2
Rated power of single interface (KW)	100		
Single port rated current (A)	144A		
Rated grid voltage (V)	400		
Frequency (Hz)	50/60		
Rated current (A)	866	577	346
Dimensions (W * H * D) (mm)	800*2100*870		
Maximum weight (Kg)	400		
Protection level	IP54		
Cooling	Fan cooling		
Corrosion resistance	C3		
Humidity	0-95% (non-condensing)		

Item	ACHub-6/1	ACHub-4/1	ACHub-2/1
Temperature* (°C)	-20 ~ 50		
Altitude (m)	< 2000		
Noise (dB)	≤75		
Seismic intensity level	8 degrees (IEC60980)		
Lightning protection	Support		
Leakage protection	Support		
Communication interface	RS485, Ethernet		
Communication protocol	Modbus RTU, Modbus TCP/IP		

3 Subsystem

3.1 EMS

EMS is a lightweight field control and energy management system, mainly used in application scenarios involving battery energy storage equipment. Through the application of this system, the power distribution of multiple energy storage devices on site, complementary monitoring of multiple energies (load, photovoltaic, wind power, generator, etc.) and energy management can be achieved.

- It covers a variety of energy storage application scenarios, including energy storage, photovoltaics, wind power, power grids and other multi-energy complementary scenarios.
- Supports access to cloud and third-party monitoring systems.
- The system operation log is traceable.
- Integrate multiple energy management strategies.

EMS appearance and parameters:

Figure 3-1 EMS appearance

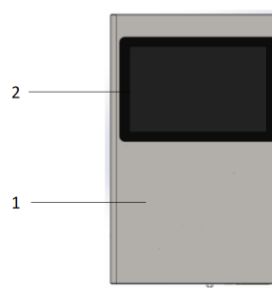


Table 3-1 EMS appearance

Item	Name	Function
1	EMS box	Cabinet
2	Monitor	Display EMS interface information

Table 3-2 EMS parameters

Project	Specifications	Remarks
Control function	Peak and valley mode, backup mode, smooth photovoltaic	
User interface	Display interface, Ethernet	
Communication interface	Ethernet *2, USB 2.0 *2, SIM card holder *1, 2 RS485, 4G *1	
Communication protocol	Ethernet: Modbus TCP	
Power input	DC12V	
Working temperature	-20 ~ 55°C	
Altitude	≤2000m	
Ambient relative humidity	5 ~ 95%	No condensation
Protection level	IP21	
Dimension	320mm*500mm*60mm	
Weight	9.3kg	
Installation	Indoor, hanging	

Table 3-3 Features list

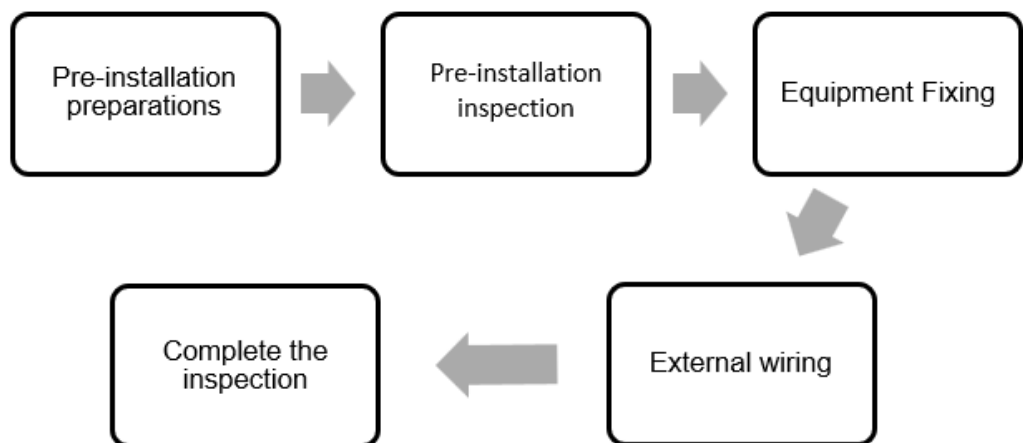
Item	Function	Description
1	System start and stop control	It can control the start and stop operation of the battery energy storage system, and decide whether to put the system into use or suspend operation according to demand.
2	System power delivery	With the ability to issue power commands, the system's power output can be adjusted as needed to meet changes in power demand.
3	System operation mode switching	Supports switching between different operating modes, such as grid-connected mode, independent operation mode or hybrid mode, to adapt to different application scenarios and requirements.
4	System data query	It provides query functions to obtain real-time

Item	Function	Description
		data, historical data, status information and operating parameters of the battery energy storage system in order to monitor and evaluate the performance and operation of the system.
5	System data export	Supports exporting system data to external devices or storage media for further analysis, logging, or report generation.
6	System control switch	The control switching function allows the control of the system to be transferred from one control device or system to another to achieve flexibility and reliability in monitoring, management and operation.

4 Installation

4.1 Installation Process

Figure 4-1 Installation process



4.2 Pre-installation Preparations

4.2.1 Installation Tools

When performing on-site installation at the project site, installation tools need to be prepared in advance.

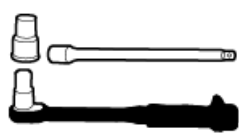
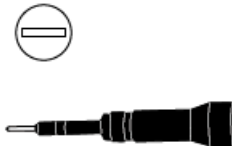
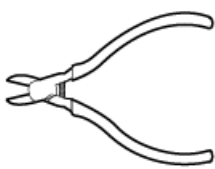
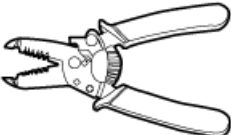
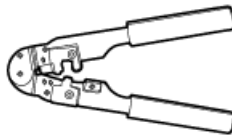
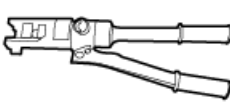
1. The tool pictures are for reference only.

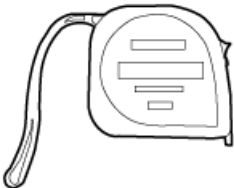
2. The tool list may not list some of the tools required on site. On-site installers and customers need to prepare tools according to on-site requirements.

Figure 4-2 Personal protective tools

			
Insulating gloves	Protective gloves	Goggles	Dust masks
			
Insulated shoes	Reflective vests	Helmet	Seat belt

Figure 4-3 Installation tools

			
Cross insulated torque screws knife	Insulated torque socket wrench (M12, M8)	Slotted insulated torque screwdriver	Rubber hammer
			
Diagonal pliers	Wire strippers	Crystal head crimping pliers	Hydraulic pliers

			
Marker pen	Multimeter	Steel tape	Thermal casing
			
Heat gun	Cable ties	Electric forklift	Forklift

4.2.2 Installation Requirements of Environment

The installation site environment requirements are shown in the following table:

Table 4-1 Installation requirements

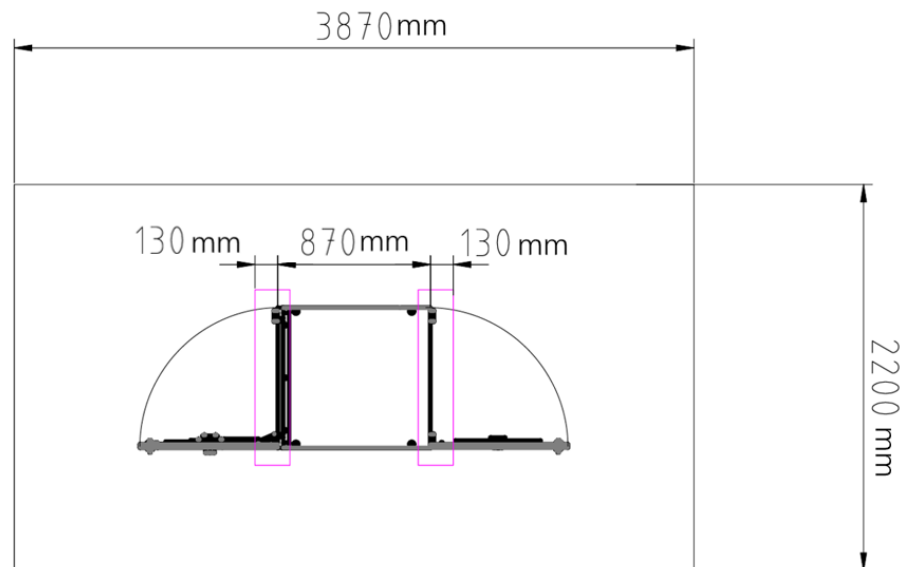
No.	Item	Requirement
1	Ambient temperature	-20°C ~ 50°C (When the battery temperature exceeds 40°C, the output power decreases)
2	Altitude	< 2000m (Derating above 2000m)
3	Humidity	0 ~ 95% (non-condensing)



NOTE!

Do not install or debug the ACHub when it is raining.

Figure 4-4 Space requirement

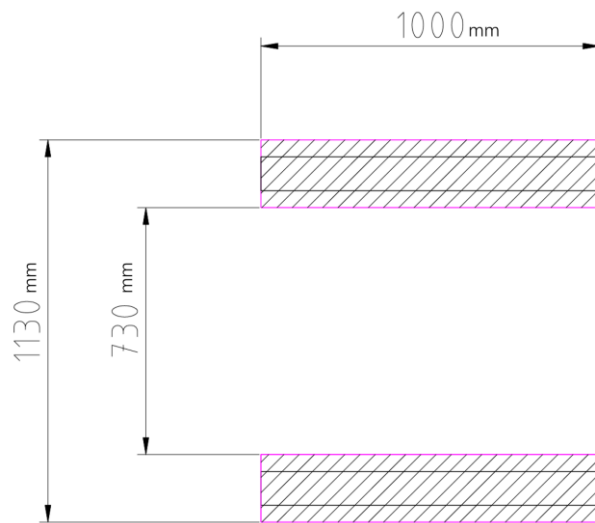


Requirements of the foundation design scheme:

- The AC Hub must be installed on concrete or other non-combustible surfaces, and must ensure that the installation plane is level, firm, and flat, with sufficient bearing capacity, and depressions or tilts are prohibited.
- Equipment foundations are configured according to the total weight of the equipment, and need to be reviewed when the load-bearing capacity of the foundation is not satisfied.
- The bottom of the pit of the equipment foundation must be compacted and filled. Equipment foundations should not be disturbed by soaking water after excavation, and should continue to be excavated and refilled if disturbed by soaking water.
- The leveling error of the contact surface between the equipment foundation and the cabinet is $\leq 3\text{mm}$.
- The foundation must be higher than the highest water level in local history and at least 100mm above the horizontal ground.
- Drainage facilities shall be constructed in accordance with the local geology and municipal drainage requirements to ensure that no water accumulates at the foundation of the equipment.

- The foundation should be constructed to meet the local historical maximum rainfall drainage requirements, and the discharged water should be disposed of in accordance with local laws and regulations.
- When constructing the equipment foundation, consider the cable outlet of the energy storage system, and reserve a trench or a hole with depth of 0.8m for the cable.
- The holes reserved for the equipment foundation and the inlet holes at the bottom of the equipment should be blocked.
- The foundation drawing cannot be regarded as the final construction drawing and is for reference only, please contact our product manager for details. Users should review the foundation design parameters of the energy storage system according to the installation environment, ground bearing capacity, geological conditions and seismic requirements of the project site

Figure 4-5 Foundation



4.2.3 Pre-installation Inspection

Check the packaging

Before unpacking the device, please check the packaging for obvious damage, such as holes, cracks, or other possible signs of internal damage, and check the device. If there are any packaging abnormalities or the device does not match, do not unpack and contact the dealer as soon as possible.

Unpacking

The energy storage busbar cabinet is transported to the vicinity of the installation site, the transport packaging needs to be disassembled. The disassembly steps are as follows:

Remove the packaging tape and foam of the energy storage busbar cabinet;

Remove the fixing bolts between the energy storage busbar cabinet and the wooden bracket;

Use an electric forklift to transfer the energy storage busbar cabinet from the bracket (for details on the transfer method, see 4.2.4);



NOTE!

When removing the packaging of the energy storage busbar cabinet, avoid scratching the paint on the cabinet.

Check the device

After unpacking, please check that the device are complete and intact, and that there is no obvious external damage. If any item is missing or damaged, please contact your dealer.

Before sending out, the energy storage cabinet has been personally inspected by the staff and the packaging is secure. After unpacking, you still need to check the following:

- Check whether the quantity of each item in the packing list is consistent with the actual item.
- Check whether the product nameplate data is consistent with the order contract, such as product model, voltage level, etc.
- Check whether the appearance of the energy storage busbar cabinet is consistent with the actual.
- Check whether the energy storage busbar cabinet is deformed, has paint peeling, or has loose parts.
- Check whether the factory documents and accessories are complete. The delivery list of the energy storage busbar cabinet is as shown in the table:

Table 4-2 Packing list

No.	Item	Specifications	Quantity
1	ACHub cabinet	Fill in the model when packing	1
2	15A DC fuse	HV110.PV 15 A	1
3	6A AC fuse	RT28-32 6A	1
4	2A AC fuse	RT28-32 2 A	1
5	2A AC fuse	RT28-32 2A	3
6	Factory report	/	1
7	key	K140	4
8	Expansion screw	M12*150	4


NOTE!

The actual packing materials and quantities shall be subject to the packing list in the packaging box.

4.2.4 Transportation

During transportation, in order to ensure that the ACHub is in a better protected state, please try to choose to transport it with packaging, and transport it according to the instructions of various signs on the packaging.

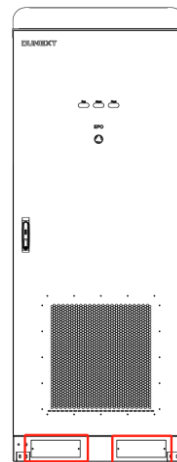
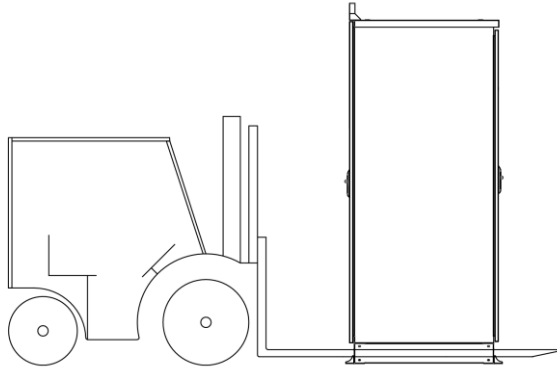
Figure 4-6 Remove the flap


Figure 4-7 Using a forklift for transportation



 DANGER!	● During transportation, the surrounding area must be checked and clear security cordons must be set up for safety protection. ● During the transportation process, no unrelated personnel shall enter the transportation danger zone.
 WARNING!	● Transporting the ACHub cabinet, only a forklift can be used. ● When moving this product, please use an electric forklift with movable forks. Manual forklifts are not recommended. ● When transporting with a forklift, protection should be provided to avoid damage to the surface of the equipment. ● When transporting by forklift, the cabinet should be secured to the forklift with belts/safety ropes. ● When transporting the ACHub cabinet, which weighs 400 kg, the forklift used should have a suitable capacity to handle this weight safely.

4.3 External Cable Wiring

Regarding the wiring of this ACHub cabinet, please connect all the wiring correctly according to the instructions in this chapter

4.3.1 General Safety Rules

	● Wiring should be done by a qualified electrician. The electrician should confirm that all cables are connected correctly. ● Wiring operation requires at least two operators. One operator performs wire operation, and the other operator monitors and reminds to avoid mis- operation. ● Before wiring, make sure all switches are off. ● The operator shall bear all consequences of any damage or accident caused by improper operation. ● Before wiring, make sure all switches are off. ● Protective equipment must be worn when connecting, including goggles, insulating gloves and safety shoes.
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4.3.2 Cable Preparing

Table 4-3 Specifications of power grid incoming cables

Product	Location	Terminals	Cable Size Requirements
ACHub-6/1	L1	SC 240 - 12	2*240mm ²
	L2	SC 240 - 12	2*240mm ²
	L3	SC 240 - 12	2*240mm ²
	N	SC 240 - 12	240mm ²
	PE	SC 240 - 12	240 mm ²
ACHub-4/1	L1	SC 120 - 12	2*120mm ²
	L2	SC 120 - 12	2*120mm ²
	L3	SC 120 - 12	2*120mm ²
	N	SC 120 - 12	120mm ²
	PE	SC 120 - 12	120mm ²
ACHub-2/1	L1	SC 150 - 12	150mm ²
	L2	SC 150 - 12	150mm ²
	L3	SC 150 - 12	150mm ²
	N	SC 70 - 8	70mm ²
	PE	SC 70 - 8	70mm ²

Table 4-4 Specifications of ACHub wiring cable

Product	Location	Terminals	Cable Size Requirements
ACHub	L1	SC 70 - 8	70mm ²

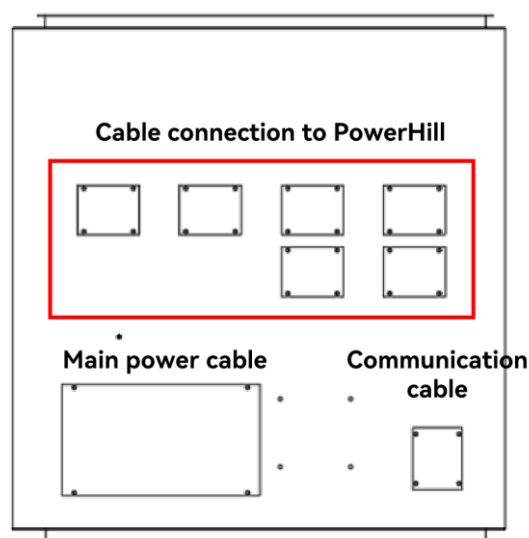
Product	Location	Terminals	Cable Size Requirements
	L2	SC 70 - 8	70mm ²
	L3	SC 70 - 8	70mm ²
	N	SC 35 - 8	35mm ²
	PE	SC 35 - 8	35mm ²

Table 4-5 Specifications of energy storage cabinet wiring cable

Location	Terminals	Cable Recommendations	Remarks
NET1	RJ45	Category 5e shielded network cable	External Interface
RS485	E0510	Shielded twisted pair 2x0.5mm ²	External Interface
I/O	E1008	BVR-1mm ²	External emergency I/O interface

Table 4-6 Main circuit and external protective earth conductors values

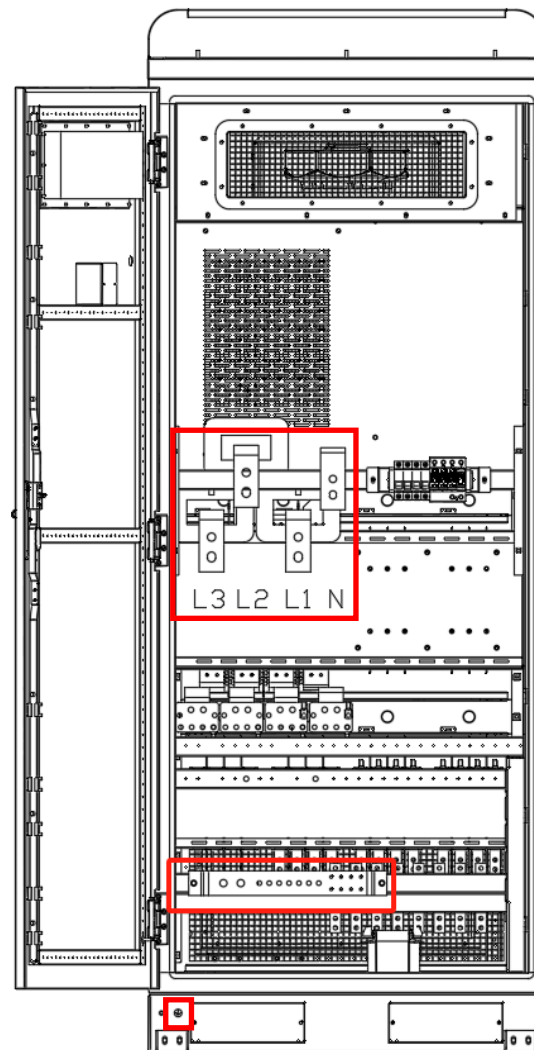
Main Circuit Conductor Cross-sectional Area S (mm ²)	External Protective Earth Conductor Sp (mm ²)
$S \leq 16$	S
$16 < S \leq 35$	16
$35 < S$	S/2

Figure 4-8 Bottom cable entry hole diagram


4.3.3 Grid Connection

As shown in the figure below, remove the baffle on the back of ACHub and connect the power grid to the copper bar. The copper bars from left to right are L3, L2, L1, and N.

Figure 4-9 Ground connection port of ACHub



4.3.4 Cable Wiring of ACHub

Figure 4-10 Front wiring position to PowerHill

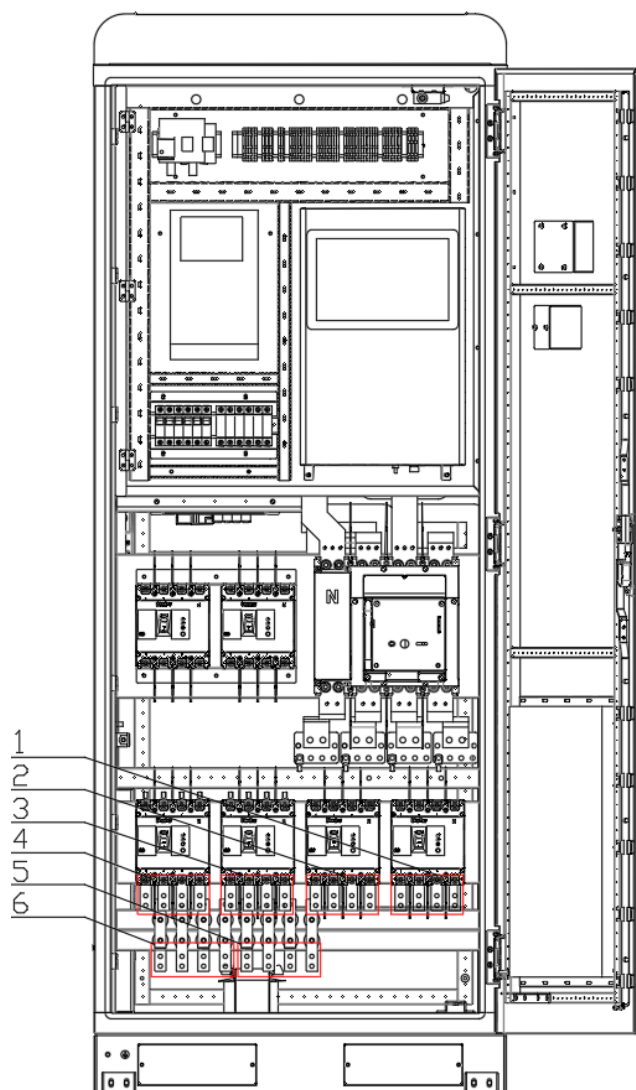


Table 4-7 Description of front wiring

NO.	Item	Description	Remarks
1	MCCB2 circuit breaker copper bar	PowerHill 1 AC cable access	From left to right: L1, L2, L3, N A maximum of 2 60kW PowerHill units can be connected in parallel
2	MCCB3 circuit breaker copper bar	PowerHill 2 AC cable access	From left to right: L1, L2, L3, N A maximum of 2 60kW PowerHill units can be connected in parallel
3	MCCB4 circuit breaker copper bar	PowerHill 3 AC cable access	From left to right: L1, L2, L3, N A maximum of 2 60kW PowerHill units

NO.	Item	Description	Remarks
			can be connected in parallel
4	MCCB5 circuit breaker copper bar	PowerHill 4 AC cable access	From left to right: L1, L2, L3, N A maximum of 2 60kW PowerHill units can be connected in parallel
5	MCCB7 circuit breaker copper bar	PowerHill 5 AC cable access	From left to right: L1, L2, L3, N 2 60kW PowerHill units can be connected in parallel
6	MCCB6 circuit breaker copper bar	PowerHill 6 AC cable access	From left to right: L1, L2, L3, N A maximum of 2 60kW PowerHill units can be connected in parallel

4.3.5 Parallel Communication Wiring

Communication method of ACHub and PowerHill

Figure 4-11 PowerHill external interface

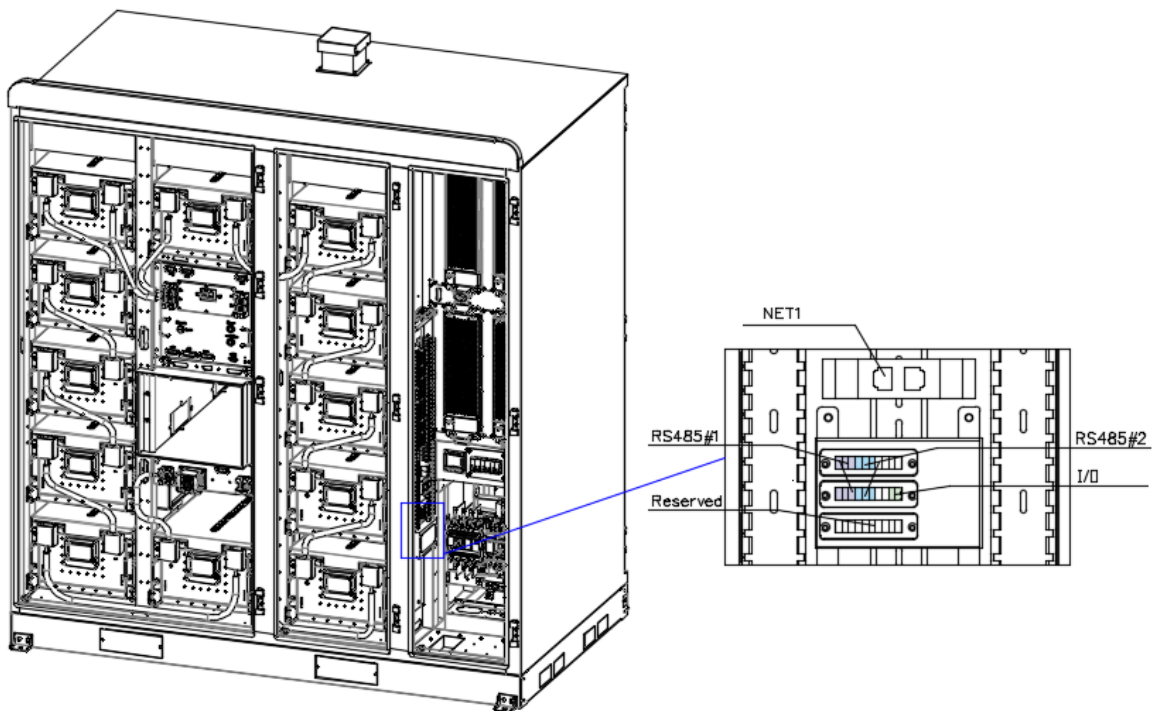
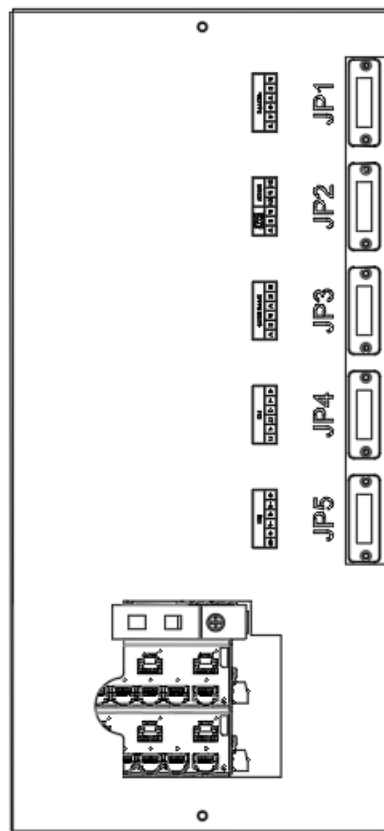


Table 4-8 PowerHill external interface

Location	Terminals	Cable Recommendations	Remarks
RS485 #1	E0510	Shielded twisted pair 2x0.5mm ²	RS485#1 external interface, 3 ports in total, from left to right: A, G, B
NET1	RJ45	Category 5e shielded network cable	

Figure 4-12 ACHub Communication interface

Table 4-9 Description of communication interface

NO.	Item	Description
1	JP1	RS485 communication, energy storage cabinet RS485 communication is connected to this interface 2
2	JP2	RS485 communication, RS485 communication is reserved 3
3	JP3	RS485 communication, RS485 communication is

NO.	Item	Description
		reserved 4
4	JP4	External emergency IO interface 5
5	JP5	External emergency IO interface 6
6	Network port lightning arrester	Reserved EMS networking interface 7
7	Switch	Energy storage cabinet data reading interface, energy storage cabinet network cable is connected to this switch


NOTE!

The values in this table are valid only when the external protective grounding conductor uses the same metal as the main circuit conductor.

Pure storage system communication network diagram – energy storage battery cabinet grid-tied star network (3 to 6 battery cabinets)

Figure 4-13 3-6 PowerHill grid-tied star network

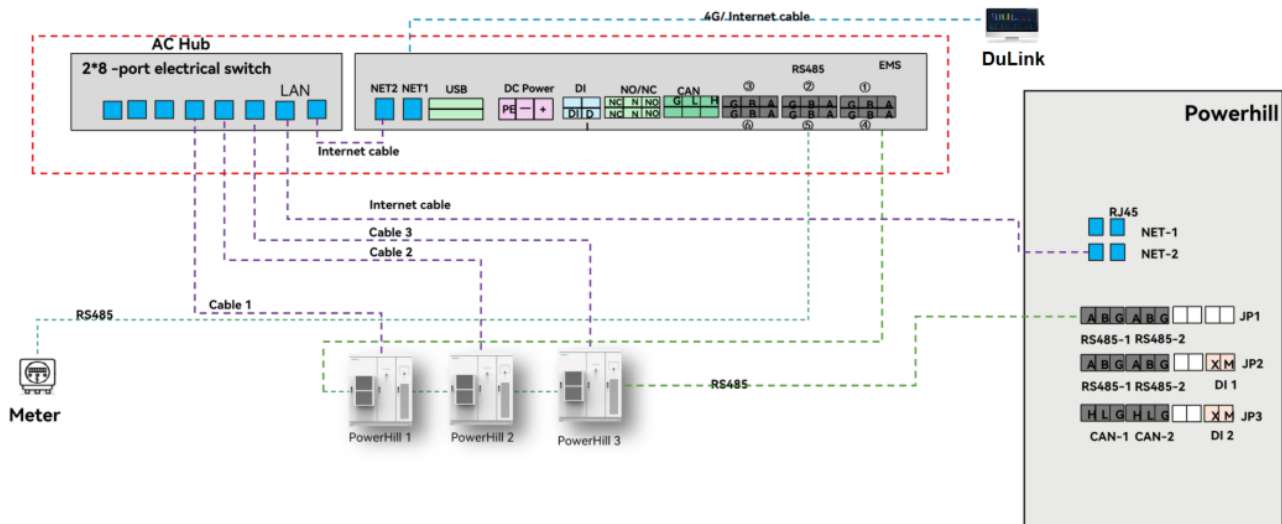


Table 4-10 3-6 PowerHill grid-tied star network communication interface

Cable SN.	PowerHill Side Connector	The Other Side	Cable SN.	One End	The Other End
1	PowerHill 1 NET-1 (RJ45)	AC Hub switch	5	PowerHill 2 JP2 RS485-2	PowerHill 1 JP2 RS485-2
2	PowerHill 2 NET-1 (RJ45)	AC Hub switch	6	PowerHill 1 JP1 RS485-1	AC Hub EMS ①
3	PowerHill 3 NET-1 (RJ45)	AC Hub switch	7	AC Hub Switch (RJ45)	Third Party EMS
4	PowerHill 3 JP1 RS485-1	PowerHill 2 JP1 RS485-1			

4.4 Overall Inspection



After the wiring is completed, another operator needs to check the wiring again to confirm that all cables are connected correctly.

Maintenance switch:

Ensure that the maintenance switch is securely installed and properly wired according to the system diagram. Check that the switch operates smoothly and is in the correct position for the current operational state.

AC, load, and PV wiring:

Inspect the AC input, load connections, and PV wiring for secure and proper connections. Verify that the cables are routed correctly with no signs of loose connections, damage, or wear. Ensure that the wiring complies with the specified gauge and insulation standards.

Ground cable connection:

Confirm that the ground cable is correctly routed and securely connected to the designated grounding points. Verify that the grounding system is intact, free from corrosion, and in compliance with local electrical codes. Ensure the ground cable is properly insulated and not in contact with any live components.

Communication cable wiring:

Check that all communication cables (RS485, Ethernet, etc.) are correctly connected to the appropriate terminals. Ensure the cables are not bent, damaged, or exposed,

and that they are routed away from high-voltage components to avoid interference. Verify the integrity of the connectors and that all cables are securely fastened to prevent disconnections.

Other inspections:

- Inspect the energy storage busbar cabinet for any deformations or damage.
- Ensure the lightning arrester is in the "ON" state (indicated by a red marking).
- Confirm the base of the energy storage busbar cabinet is securely fixed, and the support is stable and reliable.
- Check that the temperature, humidity, and ventilation in the environment around the energy storage busbar cabinet meet the required specifications.
- Verify there is sufficient space around the energy storage cabinet to ensure proper operation.
- Confirm there is no condensation or ice formation inside the cabinet.
- Ensure no tools, parts, iron filings, or any foreign objects remain inside the cabinet.
- Make sure all unused conductive parts inside the cabinet are properly insulated with insulating tape.

5

Power-On and Power-Off

5.1 Check before Power-On

Make sure to complete the wiring inspection.

Check whether the lightning arrester is closed and whether the lightning arrester is damaged.

5.2 ACHub Power-On Process



- Before powering on, ensure that the pre-power-on check is completed.
- During the operation. One operator performs the power-on operation, while the other operator monitors and reminds to avoid mis-operation.
- The operator shall bear all consequences of any damage or accident caused by improper operation.

Figure 5-1 ACHub switch location

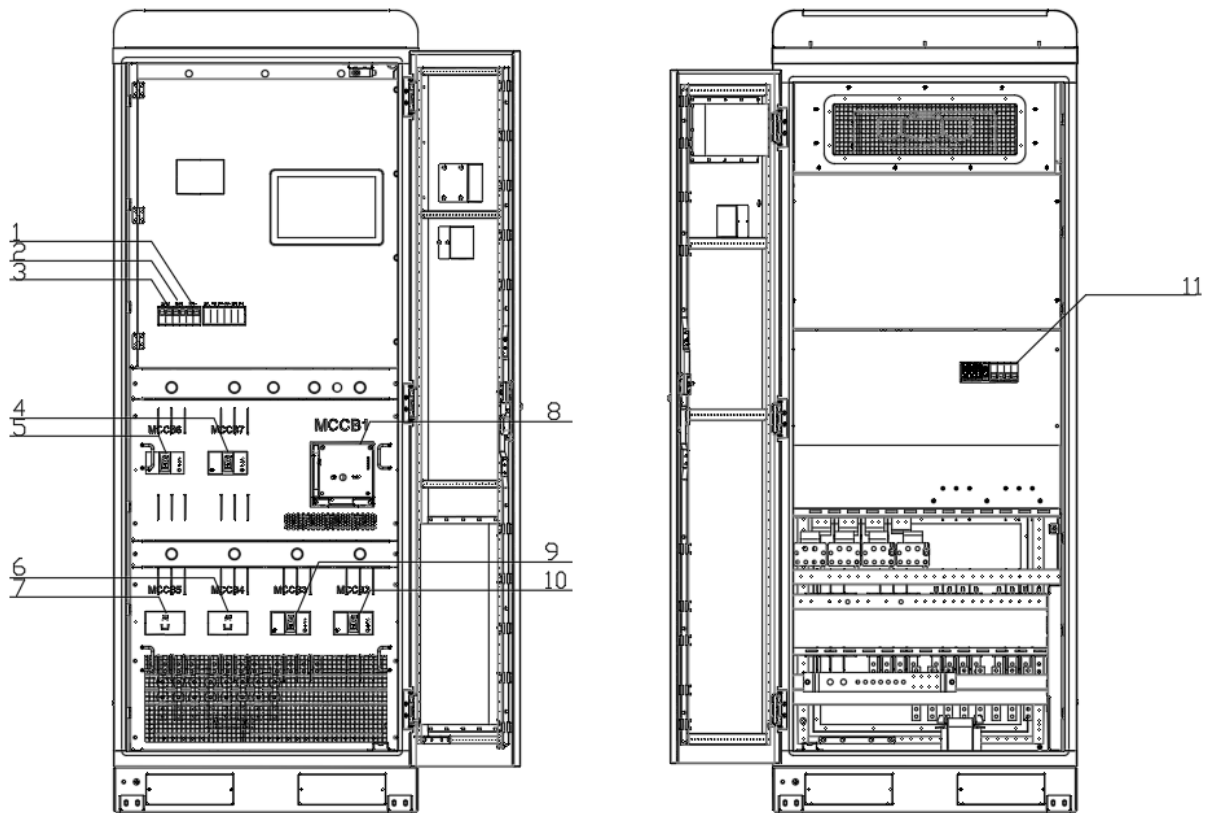


Table 5-1 ACHub switch description

No.	Item	Description
1	DC micro-breaker MCB3	DC24V power switch
2	AC micro-breaker MCB2	AC220V power switch
3	AC micro-breaker MCB1	AC220V power switch
4	Leakage circuit breaker MCCB7	Used for leakage overcurrent protection of energy storage cabinet
5	Leakage circuit breaker MCCB6	Used for leakage overcurrent protection of energy storage cabinet
6	Leakage circuit breaker MCCB4	Used for leakage overcurrent protection of energy storage cabinet
7	Leakage circuit breaker MCCB5	Used for leakage overcurrent protection of energy storage cabinet

No.	Item	Description
8	Main circuit breaker MCCB1	The grid is connected to the main switch, and the lower end is connected to the MCCB2~MCCB7 branch circuit breakers
9	Leakage circuit breaker MCCB3	Used for leakage overcurrent protection of energy storage cabinet
10	Leakage circuit breaker MCCB2	Used for leakage overcurrent protection of energy storage cabinet
11	Surge protector switch	AC lightning arrester backup protection

Power on the ACHub in the following steps:

Step 1: Turn on the surge protector switch (as shown in Figure 5-1, No.11)

Step 2: Turn on the AC micro-breaker MCB1 (as shown in Figure 5-1, No.3)

Step 3: Turn on the AC micro-breaker MCB2 (as shown in Figure 5-1, No.2)

Step 4: Turn on the DC micro-breaker MCB3 (as shown in Figure 5-1, No.1)

Step 5: Switch on the knob switch to the right to turn on the main circuit breaker (as shown in Figure 5-1, No. 8)

Step 6: Turn on the branch circuit breakers respectively and connect the energy storage cabinets (as shown in Figure 5-1, No.4, 5, 6, 7, 9, 10)

After the steps are performed in sequence, the grid is powered on, the AC circuit is started, and the circuit breaker indicator light is on. If the ACHub is in normal state, the operation indicator light flashes, and the fault indicator light and the alarm indicator light are off; then it enters the standby mode, please wait for external commands to be received.

5.3 ACHub Power-Off Process

Power off the ACHub as follow steps:

Step 1: Turn off the branch circuit breakers and energy storage cabinets (as shown in Figure 5-1, No.4, 5, 6, 7, 9, 10)

Step 2: Switch off the knob switch to the left to turn off the main circuit breaker (as shown in Figure 5-1, No.8)

Step 3: Turn off DC micro-breaker MCB3 (as shown in Figure 5-1, No.1)

Step 4: Turn off AC micro-breaker MCB2 (as shown in Figure 5-1, No.2)

Step 5: Turn off AC micro-breaker MCB1 (as shown in Figure 5-1, No.3)

After following the steps, the ACHub stops running and the indicator lights out.

Maintenance and inspection of the equipment can only be carried out five minutes after the equipment has been shut down.



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