User Manual

AHW-6~10KTHD-G1/B3-B10 Energy Storage System All-In-One

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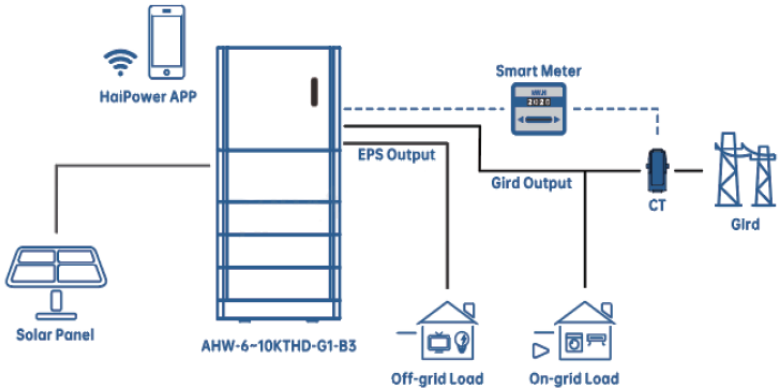
1.Safety

1.1 Purpose of use

Schematic diagram of the all-in-one system:



As shown above, a complete all-in-one system consists of the PV module, AHW inverter, lithium battery, utility grid, and other components.

1.2 Statement

ATTENTION	• We must ensure ventilation and temperature control of the operating environment for the battery as a system reference to prevent the risk of a battery explosion. The battery is recommended to be installed in the environment in strict accordance with the specifications. At the same time, indoor ventilation should be maintained with a temperature of 0–40°C and a humidity of 5%–85%. If the selected PV module requires positive or negative grounding, please consult with us for technical support before installation.
CAUTION	• Danger! High voltage! • Relevant operation for professional personnel. • Please keep children, the disabled, and non-professionals away. • Supervise and ensure no children play near the installation location for the energy storage machine.
CAUTION	• Radiation in the inverter may affect health! • Do not stay within 20cm of the inverter for a long time.

CAUTION	• Ground connection of inverter. • Please make sure a reliable ground connection for the inverter to guarantee personal safety.

1.3 Introduction to inverter symbols

Symbol	Description
	• Warning: Electric shock risk!
	• Warning: High temperature!
	• Note: Danger!
	• The high voltage of the inverter may risk your life. The residual voltage of the inverter requires 5 minutes to discharge. Please open the upper or DC cover after 5 minutes.
	• Grounding symbols
	• Direct current (DC)
	• Alternating current (AC)
	• The machine complies with the applicable requirements of CE standards.
	• Please refer to the “Instructions for Use.”

2.Introduction

2.1 Preface

This manual mainly introduces the product introduction, application scenarios, installation and debugging, system maintenance, and technical data of the AHW-6~10KTHD-G1 energy storage system (hereinafter referred to as "AHW" or "product," "equipment" or "energy storage"). This manual may be updated without prior notice.

2.2 Applicable personnel

This is only applicable to specially trained professional personnel familiar with local regulations, standards, electrical systems, and knowledge of this product.

2.3 Safety statement

1. Please read this manual carefully before installation. If the equipment is damaged due to failure of installation in compliance with the instructions specified in this manual, we have the right not to guarantee the quality.
2. All operations and connections shall be performed by professional personnel.
3. Please do not disassemble any part of the product during installation.
4. All electrical installations must comply with local electrical safety standards.
5. In case of equipment maintenance, please contact the local personnel designated for system installation and maintenance.
6. Grid-tied equipment requires permission from the local power supply department.
7. Please turn off the PV switch in installing a PV module during the day. Otherwise, the overvoltage of the module port will cause danger in the sunlight.

2.4 Product description

The AHW-6~10KTHD-G1 series are designed to store the energy generated by PV panels or the grid energy allowed in the battery, which can also be transmitted to the grid through AHW Inverter for private use. AHW Inverter can be used as a backup power supply when the grid is down.

The AHW series includes four models:

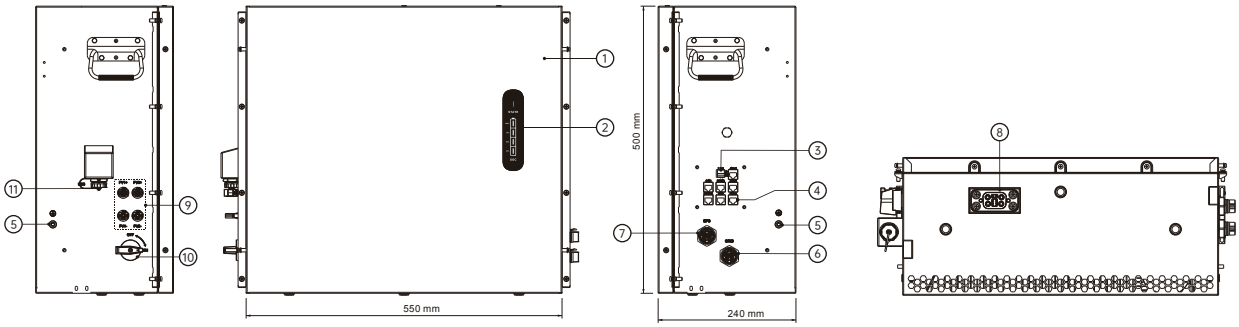
- AHW-6KTHD-G1/B3-B10
- AHW-7KTHD-G1/B3-B10
- AHW-8KTHD-G1/B3-B10
- AHW-10KTHD-G1/B3-B10

Note: B3-B10 refers to the number of equipped batteries, ranging from three to ten.

NOTE	• We describe the series as "AHW," as shown below.

Overview:

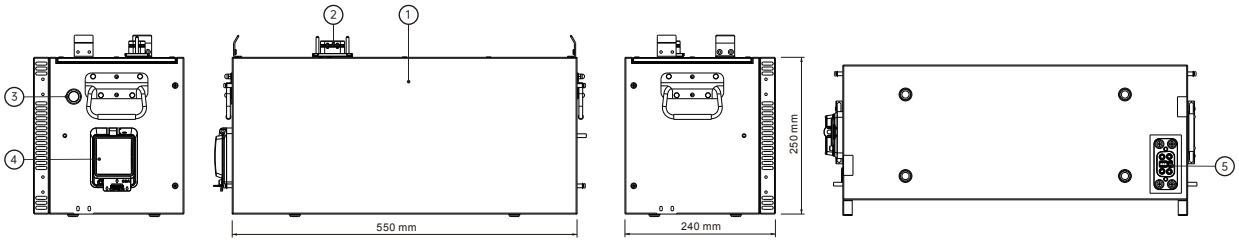
Hybrid inverter module: AHW-6~10KTHD-G1



Left View Main View Right View Bottom View

①	Hybrid inverter module	⑦	EPS port
②	Status indicator panel	⑧	Battery port
③	Dry contact	⑨	PV ports
④	Communication ports	⑩	DC switch
⑤	Grounding point	⑪	USB port
⑥	Grid interface	-	-

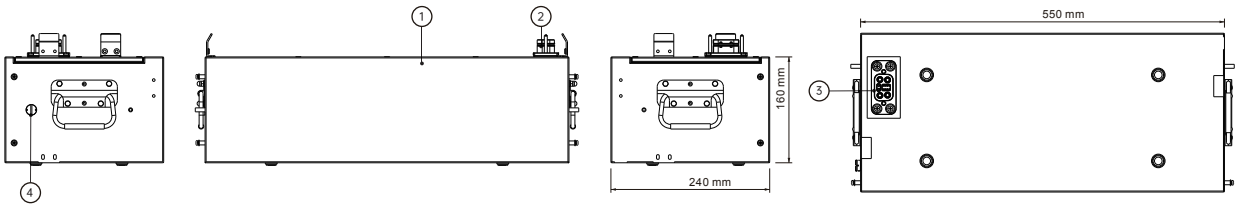
HV box module: AHW-HB50-L



Left View Main View Right View Bottom View

①	HV box module	⑤	Battery module port
②	Inverter port	-	-
③	Switch		
④	DC circuit breaker		

Battery module: AHW-2.56HD-L



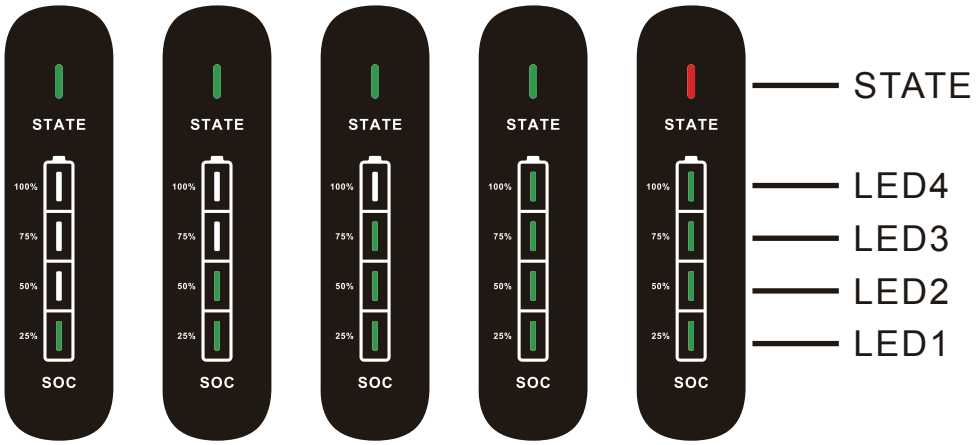
Left View Main View Right View Bottom View

①	Battery module	③	Battery module port
②	HV box port	④	Pressure relief valve

3.Product Description

3.1 Description of inverter symbols

The functions of LED indicators are described in the diagrams below.



Machine	STATE Color	Mode	Frequency	Remarks
Standby state	Green light	Flash	On for 0.5s, and off for 0.5s	Breathing light flashes.
Grid-tied state	Green light	Always on	Always	The green light stays on under normal operation.
Off-grid state	Green light	Always on	Always	
Inverter alarm	Green light	Flash	On for 0.5s, and off for 0.5s	The green light flashing indicates the inverter alarm.
Inverter fault	Red light	Always on	Always	The red light indicates the inverter fault.
Battery fault	Green light	Flash	On for 0.5s, and off for 0.5s	The green light flashing indicates battery fault.
Battery alarm	Green light	Always on	Always	-
Hardware upgrade	Red light	Flash	On for 0.5s, and off for 0.5s	-

3.2 Labels interpretation

Taking AHW-10KTHD-G1 as an example, the labels contain the following information:

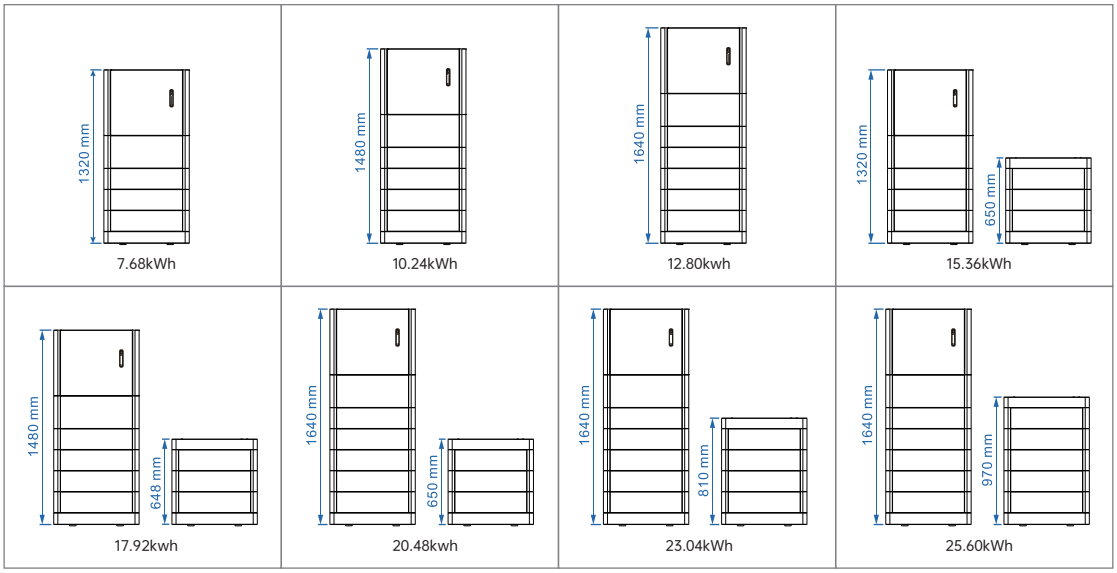
Label description:

Product type	Remarks
PV input data	-
Max PV voltage	1000Vdc
Range of PV voltage	120~1000Vdc
PV short-circuit current (ISC)	20A*2
Max. input current	16A*2
AC input/output data	-
Max output active power	10000W
Max apparent power	10000VA
Nominal output voltage	3W/N/PE 230/400Vac
Max output current	15.2A
Rated output frequency	50Hz/60Hz
Power factor range	0.8 leading~0.8 lagging
Independent data	-
Nominal AC output power	10000W
Rated AC output power	230/400Vac
Nominal AC output	50Hz/60Hz
Battery data	-
Battery voltage range	100~600Vdc
Max charge/discharge current	25A
Battery type	Lithium battery
Others	-
Safety level	Level I
Protection rating	IP65
Temperature of working environment	-10℃~+45℃

3.3 Dimensions and product configuration

See 2.4 for the dimensions of each module.

Overall stack effect display (Number of batteries: 3–10)



4.System Installation

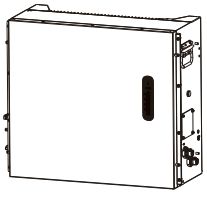
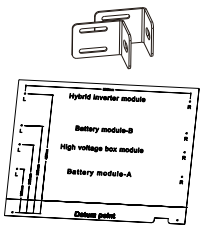
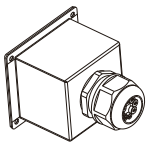
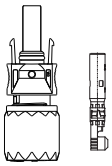
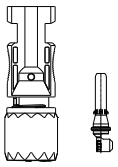
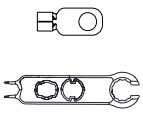
4.1 Check external packing

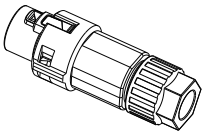
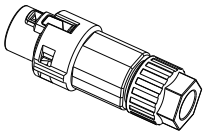
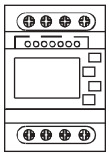
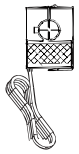
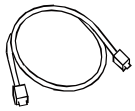
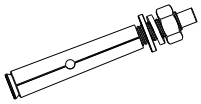
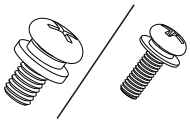
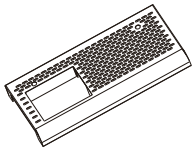
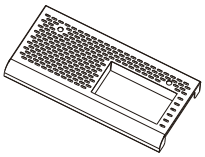
Before unpacking the external packing of the energy storage machine, please check whether there is any visible damage on the external packing, such as holes, cracks, or other signs of possible internal damage, and check the model. Please do not unpack it and contact your dealer as soon as possible in case of any abnormal packaging or model discrepancies.

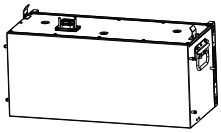
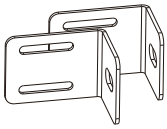
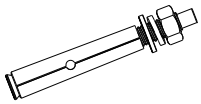
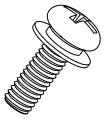
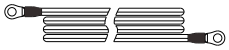
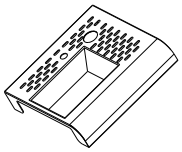
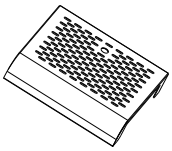
4.2 Check deliverables

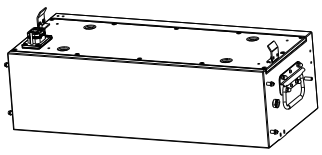
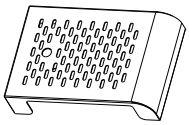
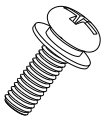
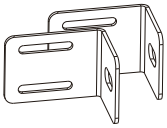
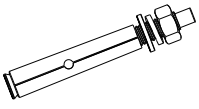
After unpacking the external packing of the machine, please check the deliverables for completeness and obvious external damage. Please do not unpack it and contact your dealer as soon as possible in case of any abnormal packaging or model discrepancies.

The accessories of the all-in-one machine are as follows:

Accessories of the hybrid inverter			
 The hybrid inverter	 Wall-mounted brackets/Installation instruction cardboard	 Waterproof cover	 PV terminal+
		 PV terminal-	 Ground wire O-terminal and PV terminal disassembly tool

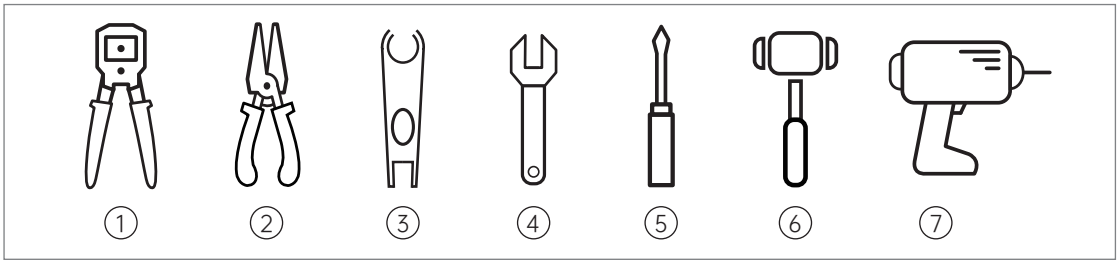
 Quick Installation Manual	 Certification	 AC grid connector	 EPS output connector (blue connector)
 Ammeter	 CT (Optional)	 Communication wires of the ammeter	 Data logger of Wi-Fi-U
 M6x60 expansion screw	 M6x12 screw M4x12 screw	 Decorative cover of inverter-right	 Decorative cover of inverter-left

Accessories of the HV box module			
 HV box module	 Wall-mounted brackets	 M6x60 expansion screw	 M4x12 screw
 Ground wire	 Decorative cover of the HV box-left	 Decorative cover of the HV box-right	 Installation base

Accessories of the battery module		
 Battery module	 Battery decorative cover*2	 M4x12 screw
	 Wall-mounted brackets	 M6x60 expansion screw

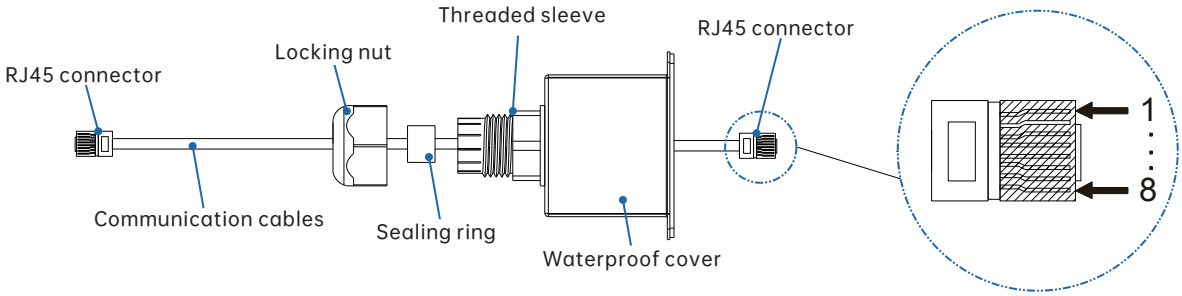
4.3 Preparation of installation tools

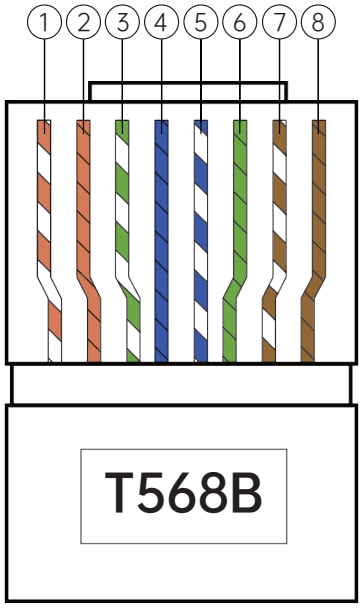
Tools to be used and prepared for installation are as follows:



Location	Tool name	Remarks / Purpose of use
1	Crimping plier for RJ45 connectors	To press RJ45 terminals
2	Crimping plier	To press battery terminal connectors
3	PV disassembly tool	To remove PV terminals
4	Wrench	To loosen the nut
5	Screwdriver	To unscrew
6	Rubber hammer	To strike the expansion bolt
7	Impact drill	To drill on the wall

LAN cables with RJ45 terminals are as follows:





Pin	Color
1	White & orange
2	Orange
3	White & green
4	Blue
5	White & blue
6	Green
7	White & brown
8	Brown

4.4 Select installation positions

Installation angle requirements

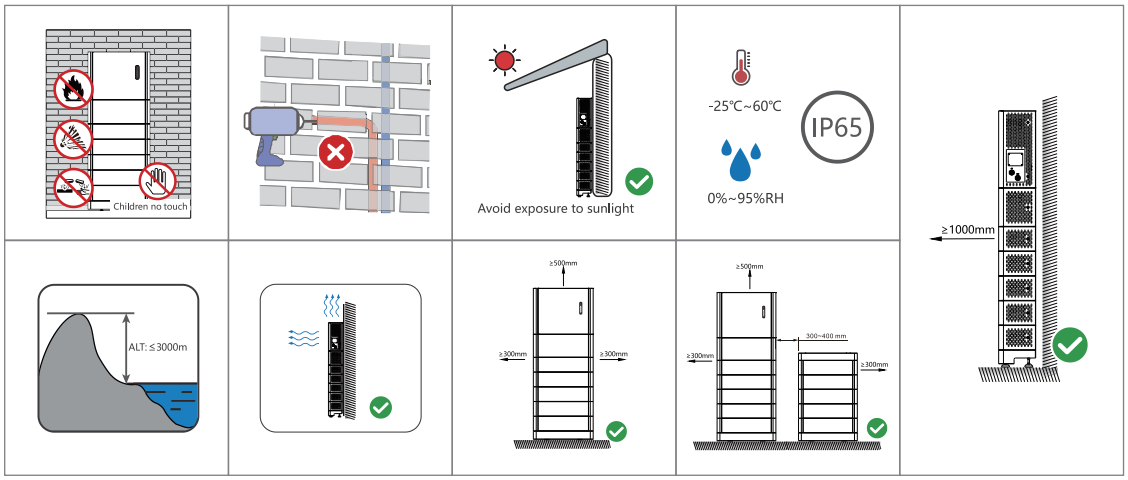
The all-in-one machine supports floor-mounted installation.

Installation angle requirements:

Do not tilt the machine forward, horizontally, upside down, backward, or sideways.

- Installation location requirements
- Please select the solid brick-concrete structure, concrete wall, and floor for installation location. If other types of walls and floors are selected, they must be made of flame-retardant materials and should meet the load-bearing requirements of the equipment.
- Installation space requirements
- During installation, please ensure that no other equipment (except related installer equipment and sunshade) and inflammable and explosive articles are around, and reserve sufficient space to realize the requirements of heat dissipation and safety isolation.

Please refer to the following figure for details:



4.5 Installation instructions

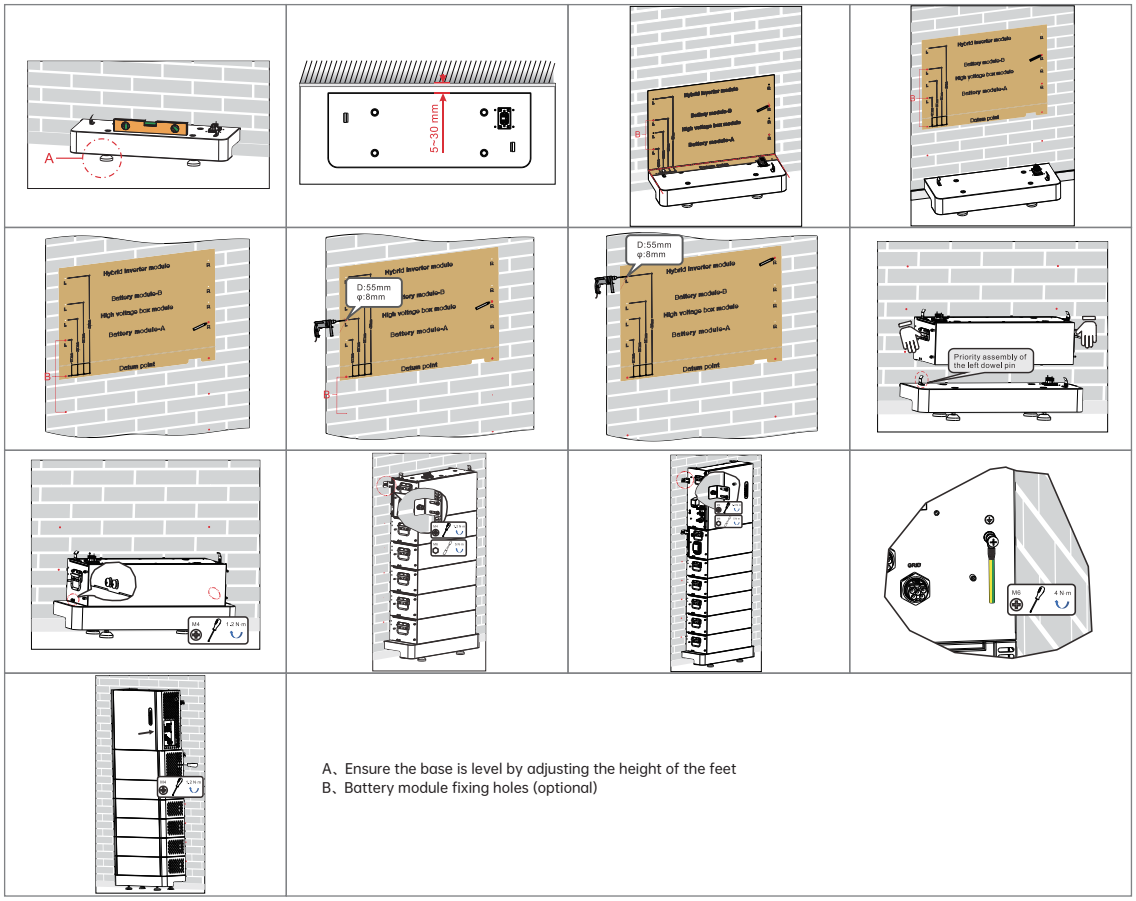
4.5.1 Pay attention to layout (considering the sensor length)

1. For AHW-10KTHD-G1, only the ammeter is used as a sensor. You should know the following content before installing the system:
2. The cable of the ammeter is recommended not to exceed 15m, so you should consider the cable length between the system and the combiner box.
3. The ammeter must be installed on the live wire.

4.5.2 AHW installation

NOTE	• The inverter and the HV box module must be fixed on the wall. When the equipment is installed in an earthquake-prone area or a place susceptible to vibration, it is recommended to mark the fixing holes of the battery module and drill holes to install expansion screws. The first battery module must be fixed on the wall. Please install the next (battery) module after each (battery) module is installed and the left and right screws are tightened.

Installation steps are as follows:



1. First, set the legs of the base to an appropriate height and make them horizontal, and at the same time, ensure that a distance of 5–30mm is reserved between the base and the wall, which is also the distance between the whole system and the wall;
2. Determine the drilling positions of the inverter, HV box, and battery with the cardboard (installation guide), and put the cardboard on the wall to ensure that the top edge of the cardboard is horizontal. Mark points on the wall through the holes in the cardboard, then remove the cardboard;
3. Drill 4 holes with a diameter of 8mm and a depth of not less than 55mm at the marked points;
4. Place the first battery on the base in a stacked manner, align the locating pin on the left first, and lock the connector between the battery and the base;

5. (Take five batteries as an example) After all the batteries are installed according to Step 4, stack the HV box and inverter on the system successively, and lock wall-mounted brackets between each module and the wall;
6. Connect the system with the earth through the ground wire;
7. Lock the left and right decorative covers of all modules with screws; and
8. Installation is completed.

5.Connection of System Wires

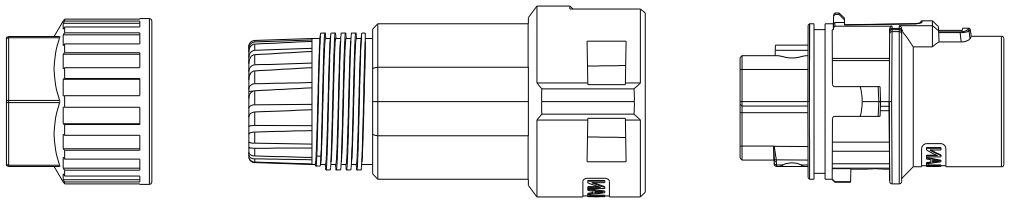
5.1 Connection of AC input terminals

The connection between an AC input terminal and an EPS output terminal is as follows:

Step 1:

Remove the AC terminal as shown in the figure below;

①

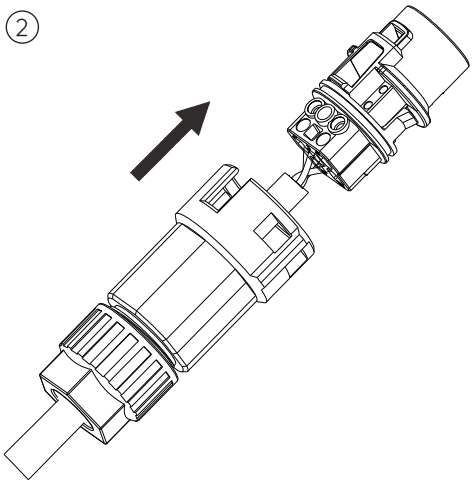


Pressure screw　　Threaded sleeve　　Connection port

Step 2:

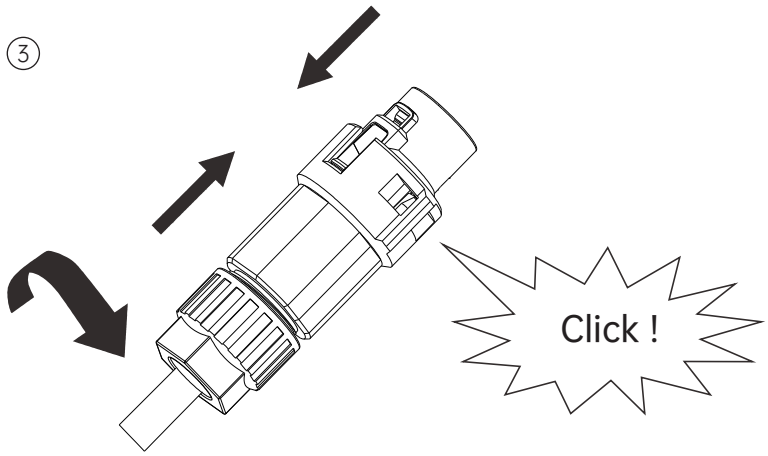
Thread the cable through the pressure screw, the sealing ring, and the threaded sleeve in turn, insert the cable into the wiring terminal according to the polarity indicated on the terminal, and tighten the screw;

②



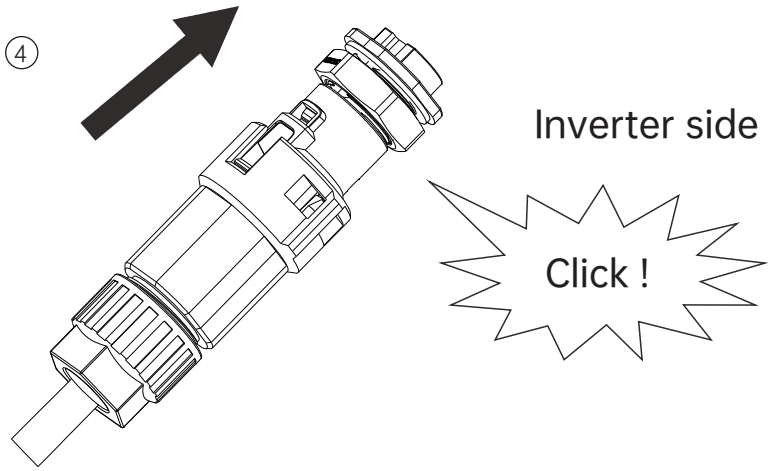
Step 3:

Push the threaded sleeve into the connection terminal until both ends are securely tightened;



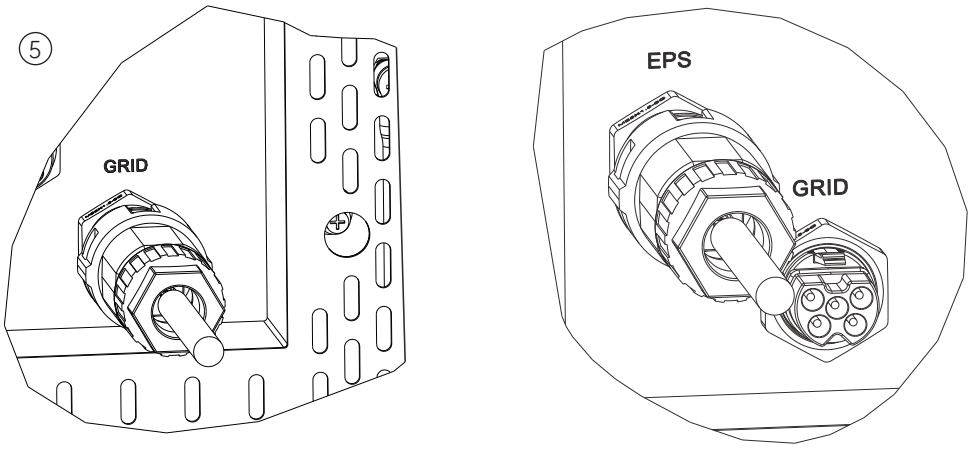
Step 4:

Insert the socket into the AC output terminal, tighten the socket clockwise, and loosen the socket counterclockwise.



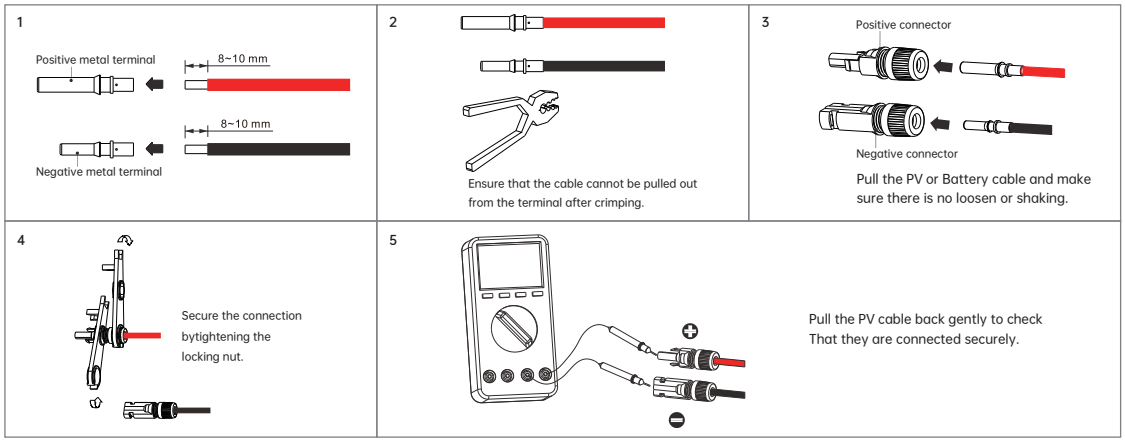
Step 5:

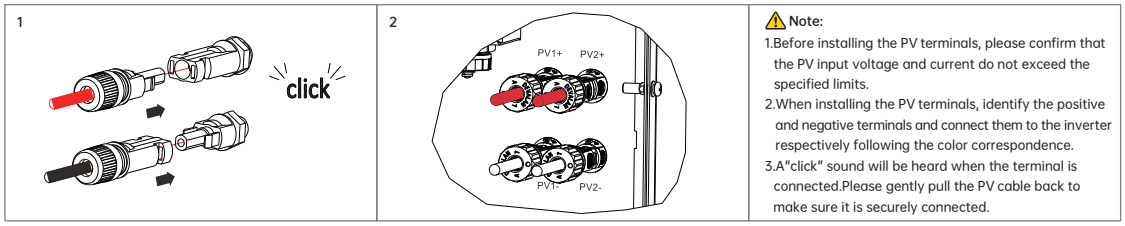
Push the plug into the terminal.



5.2 PV terminal connection

The PV terminal is connected as shown below:





Recommended cable length:

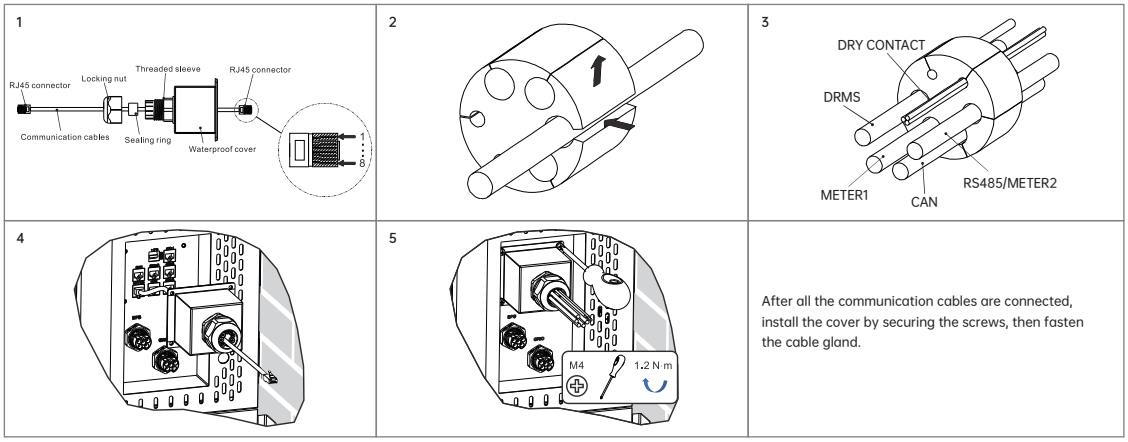
Conductor cross-section	Max cable length			
	AHW-6KTHD-G1	AHW-7KTHD-G1	AHW-8KTHD-G1	AHW-10KTHD-G1
10AWG	59m	50m	44m	35m
12AWG	37m	31m	27m	22m

5.3 Ammeter terminal connection

When the client needs to use the ammeter to monitor the energy flow, the steps for the ammeter port connection are as follows:

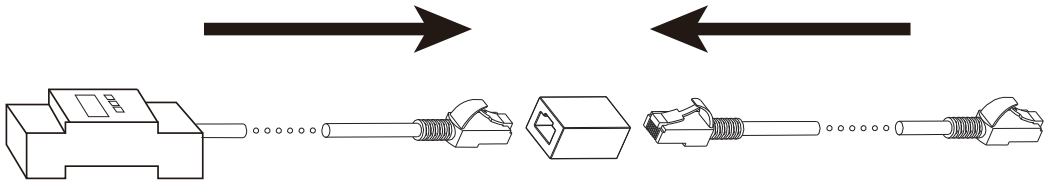
1. Refer to 4.3 for making LAN cables with RJ45 terminals.
2. Place the rotating nut onto the LAN cables.
3. Press the cable support sleeve out of the cable sealing gland.
4. Remove the filler plug on the cable support sleeve.
5. Thread the LAN cables through the opening of the cable support sleeve.
6. Thread the LAN cables through the cable sealing gland.
7. Insert the RJ45 plug of the LAN cables into the METER pin connector on the inverter until it is inserted in place.
8. If no other cables need to be installed, fasten the waterproof cover to the inverter with screws.
9. Screw the rotating nut onto the waterproof cover.

NOTE	• The ammeter must be supplied from us. Otherwise, the ammeter may fail to communicate with the AHW inverter. • For detailed instructions on ammeter installation, please refer to the Ammeter Instruction Manual.



NOTE	• Ammeter cable (length: 15m) specification: RJ45, standard LAN cable (with 8P modular plug at one end and transformer at the other end).

However, if the length is not enough, the client may extend the cable to a maximum of 25m. The operation illustration is as follows:

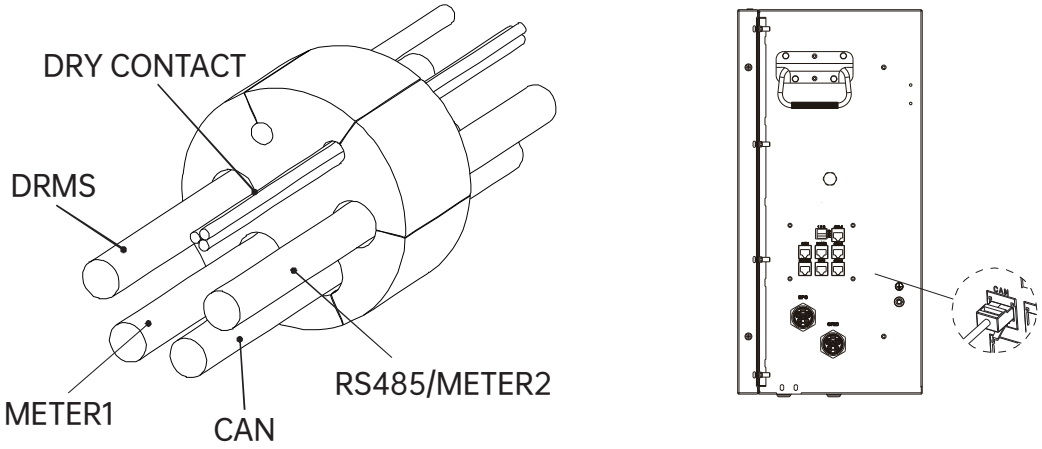


5.4 Communication port connection(CAN)

The steps for connecting the lithium battery terminal (RJ45) are as follows:

1. Unscrew the rotating nut from the cable gland.
2. Thread the rotating nut through the CAN cable.
3. Push the cable support sleeve out of the cable gland.
4. Remove the filler plug on the cable support sleeve.
5. Thread the CAN cable through the opening of the cable support sleeve.
6. Thread the CAN cable through the cable sealing gland.
7. Insert the RJ45 plug of the network cable into the CAN pin connector on the inverter until the CAN pin is fastened.

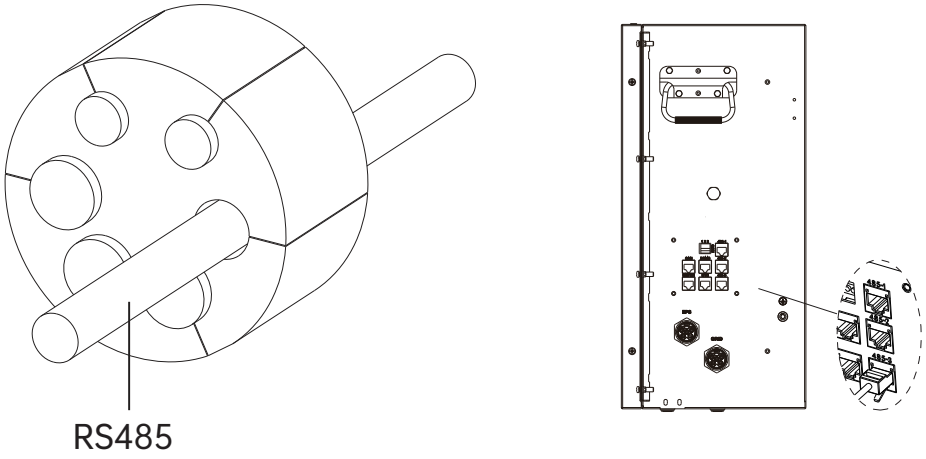
8. If no other cables need to be installed, fasten the waterproof cover to the inverter with screws.
9. Screw the rotating nut onto the waterproof cover.



5.5 RS485 terminal connection

The reserved RS485 communication port can be used for instrument communication. Please connect the wiring terminals (RJ45) as instructed as follows:

1. Unscrew the rotating nut from the cable gland.
2. Place the rotating nut onto the RS485 cable.
3. Press the cable support sleeve out of the cable gland.
4. Remove the filler plug on the cable support sleeve.
5. Thread the RS485 cable through the opening of the cable support sleeve.
6. Thread the RS485 cable through the cable gland.
7. Insert the RJ45 plug of the network cable into the 485-2 pin connector on the inverter until it is inserted in place.
8. If no other cables need to be installed, fasten the waterproof cover to the inverter with screws.
9. Screw the rotating nut onto the waterproof cover.

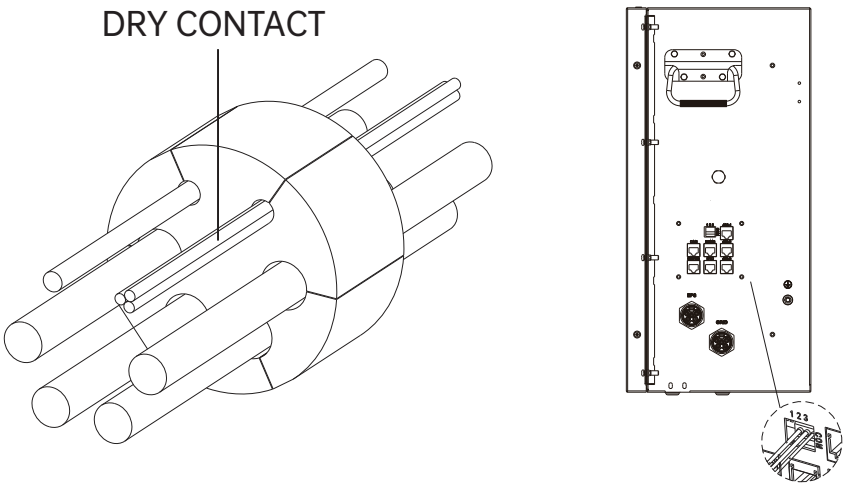


5.6 Dry contact connection

Dry contact is used to communicate with external devices (such as smart water heaters).

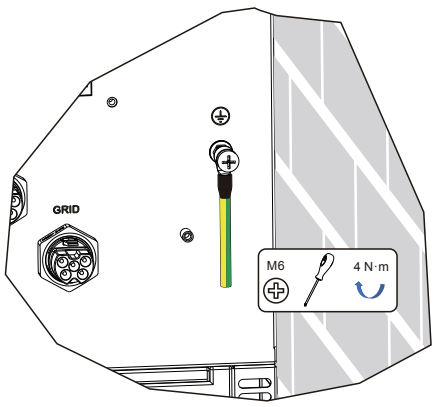
The steps for wiring the dry contact are as follows:

1. Unscrew the rotating nut from the cable gland.
2. Place the rotating nut onto the cable.
3. Press the cable support sleeve out of the cable gland.
4. Remove the filler plug on the cable support sleeve.
5. Thread the network cable through the opening of the cable support sleeve.
6. Thread the network cable through the cable gland.
7. Thread the cable through the inverter wiring terminal and press the terminal with related tools to ensure that the cables are secured.
8. If no other cables need to be installed, fasten the waterproof cover to the inverter with screws.
9. Screw the rotating nut onto the waterproof cover.



5.7 Grounding connection

AHW must be grounded by cables, and the grounding point is as follows (the cross-sectional area of the grounding wire > 10mm2).



PV array grounding

The grounding conductor of the PV panel bracket must be secured on the PV array and inverter sides. The cross-sectional area of the grounding conductor must be equal to that of the DC grounding conductor.

Min cross-sectional area of the cable should be 10mm2.

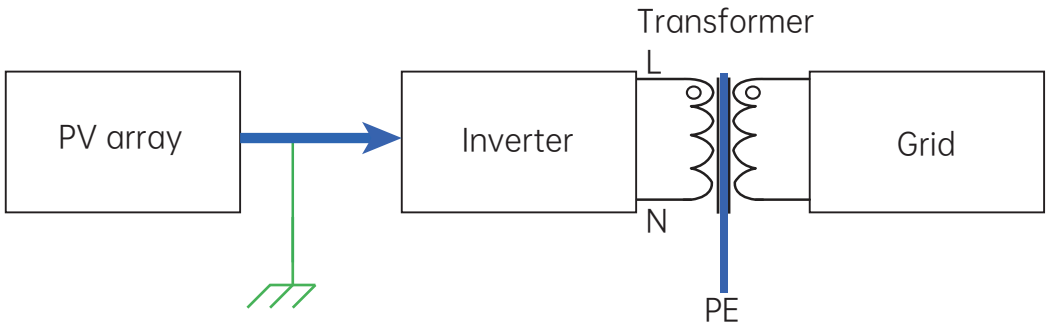
DC grounding

Please select the "DC grounding" mode according to local standards and use the PV grounding junction box and "DC grounding wire" with the same specifications.

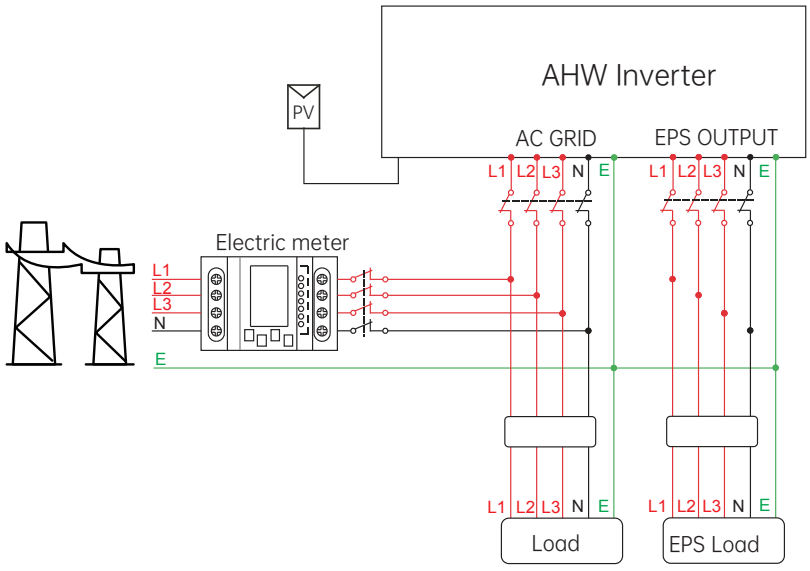
Grounding device

If the anode or cathode of the PV array in the PV system should be grounded, the inverter output shall be insulated with an isolation transformer which must conform to IEC62109-1 and IEC62109-2 standards.

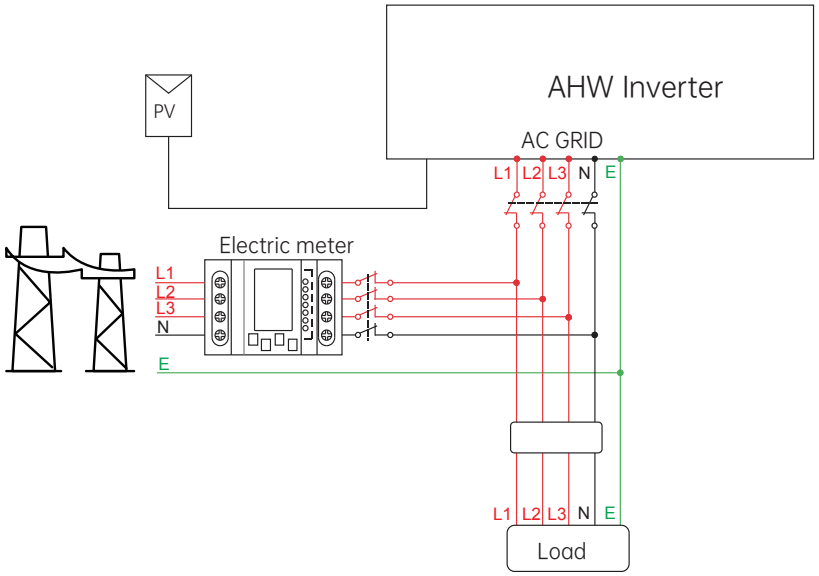
The way of connection is as follows:



The recommended wiring is as follows:



NOTE	• This figure is an example of a grid-tied system with no special requirements for electrical wiring, and the neutral wire is necessary.



NOTE	• If the client only wants to use the grid-tied storage system, a neutral wire is necessary.

Please note that:

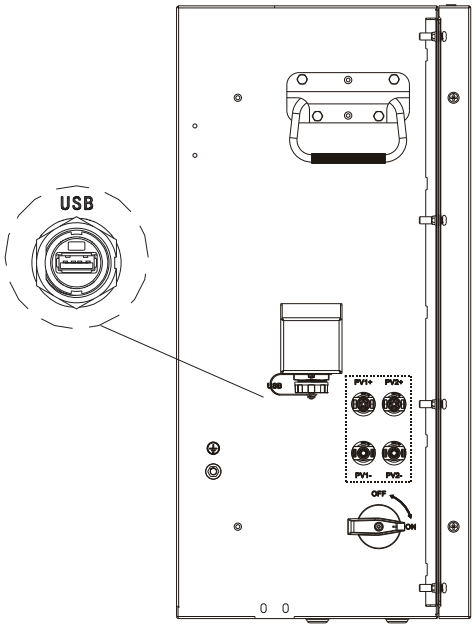
1. If a grid-tied use is needed only, please refer to 5.1 Connection of AC grid and suspending EPS output terminals.
2. If you want to use the grid and standby power supply at the same time, please refer to the connection of the AC grid and EPS output terminals.
3. Grid-tied and off-grid terminals cannot be directly connected.
4. Off-grid terminals cannot be connected to the grid.
5. The first startup of the system needs a power supply from the grid.
6. EPS output does not support half-wave loaded devices, such as the blower.

5.8 Communication

5.8.1 Instruction for use of the USB-A port

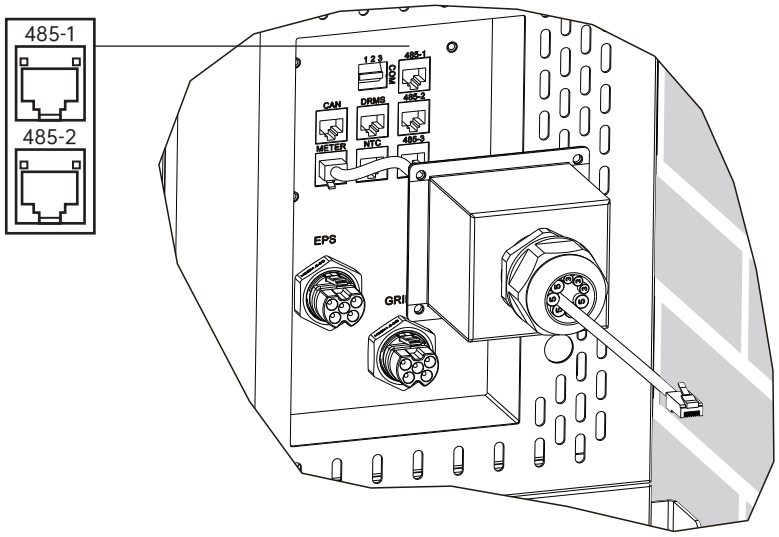
The USB-A port is mainly used to connect the collector for data monitoring and firmware updates.

With the USB connection, we can quickly update the software of the machine and observe the operating state of the machine in real-time through the monitoring platform. You can see that USB port A port is as follows:

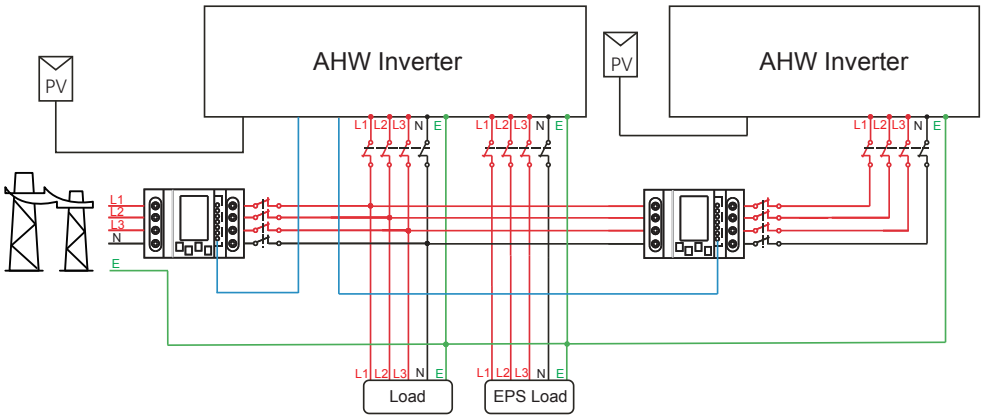


5.8.2 Use of 485-1/485-2 ports

The 485-1/485-2 ports are an extended 485 port on AHW, which should be used with RS485 settings to communicate with external devices.

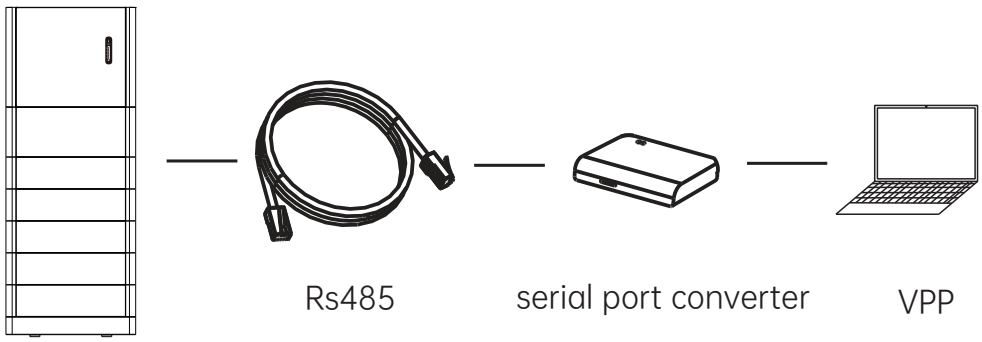


When it is set to the Meter2 mode, the wiring diagram is as follows:



As a host, AHW will receive information from two instruments at the same time: the first instrument (the original AHW instrument) should be connected to the bus on the grid side, with the communication line connected to the instrument port, and the second connected to the inverter output end, with the communication line connected to the 485-1/485-2 ports.

When it is set to the VPP mode, the wiring diagram is as follows:

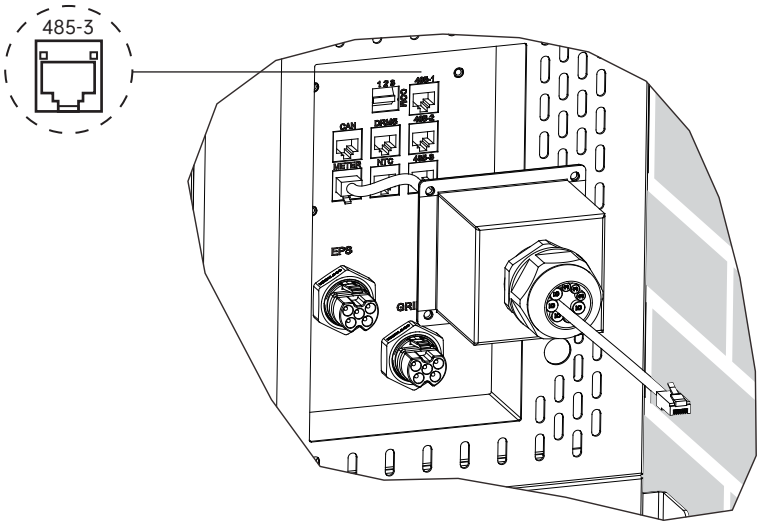


When the external VPP collector is connected to the 485-1/485-2 ports through the network cable, AHW responds to the relevant instructions sent by VPP.

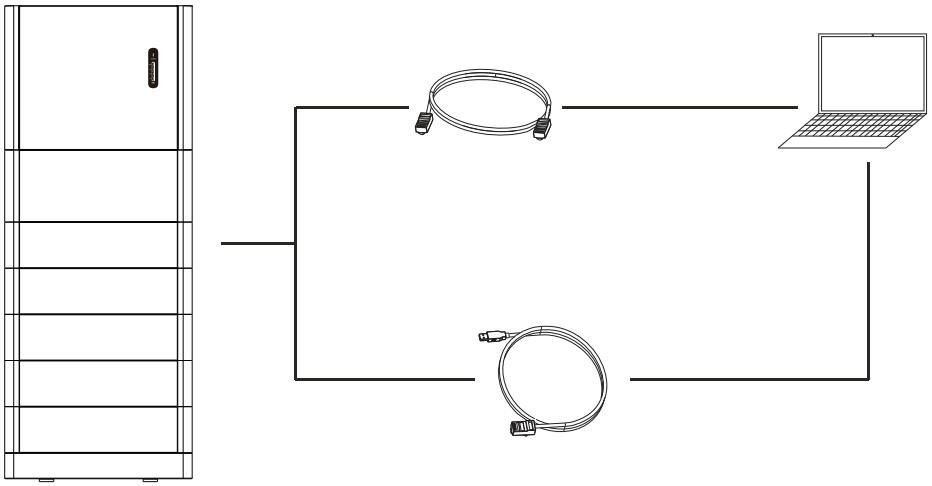
5.8.3 Use of 485-3 port

The 485-3 port is mainly used to connect a PC for monitoring. Users can monitor the machine, set parameters, and update software via the connection between the machine and PC with the modbus software.

Please download the modbus software from our official website, if necessary.



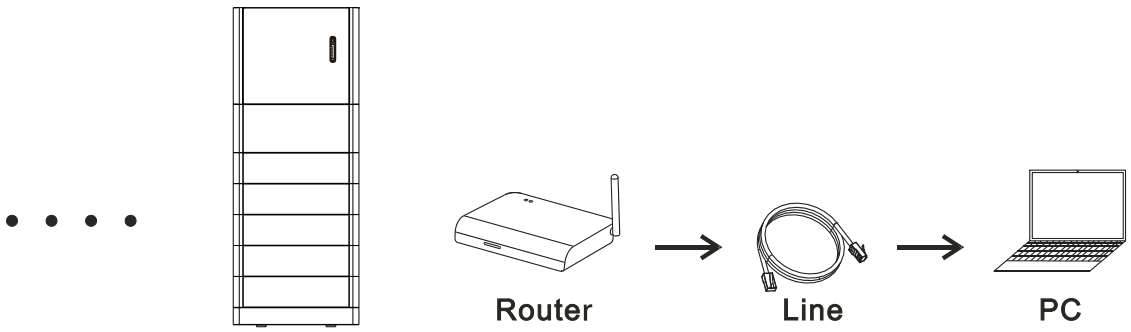
The wiring diagram is as follows:

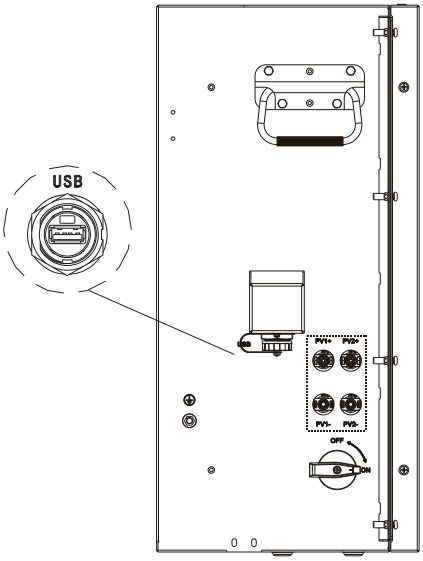


5.8.4 AHW monitoring

AHW provides an RJ-45 port. Users can monitor AHW through the following communication schemes.

NOTE	• This monitoring device can only be used together with the HaiPower monitoring platform. • Wi-Fi-U is connected to the inverter through a USB port, and the data is monitored by a PC/mobile phone.





6. Debugging

6.1 AHW debugging

After all the installation steps specified in Section 5 are completed, the energization steps of AHW are as follows:

1. Connect to PV.
2. Connect to AC.
3. Connect to the battery.
4. Turn on the AC power supply.
5. Turn on the battery.
6. Start up PV.

If the PV grid and battery are available, the system will work in "normal" modes. When AHW is under normal mode, the LED displays in green color. If AHW fails to enter the normal mode and the LED displays in red color, the following inspection is required:

1. Make sure all connections are correct.
2. All external switches are turned on.
3. The inverter's built-in switch is turned on.
4. Make sure the lithium battery is turned on.
5. Please refer to Section 8.1 for correction.

6.2 Operating mode

6.2.1 Normal modes

Normal modes refer to the working state, including online and backup modes.

Online mode
When AHW works under the online mode, users can set the appropriate priority mode as requested. If using website settings, users can set the priority mode for up to three periods. Load priority: Load priority is the default mode, under which PV energy will be prioritized for supplying the load and the battery. When the PV is insufficient, the battery will discharge; when PV power generation meets the load, excess energy will be fed to the battery. In case of no or full battery, the excess energy will be fed to the grid (except for reflux prevention). Battery priority: When AHW works under this mode, the battery will be charged first, which is suitable for working in low power periods. Users should set the time when the mode is turned on and off, as well as the end time of the battery SOC. Users can set the power rate to less than the maximum output power of the battery. If the AC CHG (charge using the AC grid) is not enabled by users, the inverter will use PV power generation to charge the battery as much as possible. If the AC CHG is enabled, the inverter will use the PV and AC power supply of the grid to charge the battery as much as possible. Grid priority: When AHW works under the grid priority mode, PV energy will be fed to the grid first. Users can select high power periods. Users should set the time when the mode is turned on and off, as well as the end time of the battery SOC. Users can set the power to less than the maximum output power of the battery.

Backup mode
If the grid is lost, the system will switch to the backup mode (which can be disabled by users) and output AC from the EPS load port. All energy comes from PV and batteries. If the PV is also lost, only the battery will be discharged. Please note that the maximum output power of AHW under this mode is 10,000W, and the load connected to EPS load shall be less than 10,000W.

NOTE	
	• For more settings, please contact with installer. • If there is a need to charge the battery with the grid power, users can enable the AC CHG.

6.2.2 Fault mode

AHW's intelligent control system can continuously monitor and adjust the state of the system. When the AHW inverter detects any accident, such as system or machine failure, the LED indicator will light up under the fault mode.

 NOTE	• Please refer to 8.1 for detailed faults. • Certain fault information serves as a reminder for users that possible faults arise in the system.

6.2.3 Firmware upgrade mode

The firmware upgrade mode means AHW is upgrading. Do not disconnect the power supply during the process. After the processing is completed, the AHW inverter will automatically log off after the update and switch to other modes.

6.2.4 Inspection mode

AHW will enter the self-inspection mode before it works under normal modes. If everything is normal, the system will enter the normal modes. Otherwise, it will enter the fault mode.

6.2.5 Standby mode

If the system has no faults under unqualified circumstances, AHM will remain in standby mode.

6.2.6 Shutdown mode

If the operation of the AHW inverter needs to be stopped, the client must disconnect all power supplies, and the AHW inverter will automatically enter the shutdown mode.

The shutdown steps are as follows:

- Turn off PV.
- Turn off the battery switch.
- Turn off the AC power supply of AHW, then the LED is off.

 NOTE	• After all steps above are completed, you still need to wait for more than five minutes.

6.3 Country/Region settings

We can provide machines meeting various rules and regulations. After receiving the machines, users can set corresponding rules and regulations with the mobile APP based on their country / region. Please select the correct option when installing the inverter. The introduction to the regulations is as follows.

No.	Mode No.	Regulation name	Country/Region name
1	S01	Germany VDE0126	SA_VDE0126
2	S02	China	SA_CQC_2018
3	S03	(NULL)	SA_CEI0_16
4	S04	Italy	SA_CEI0_21
5	S05	Chile	SA_CHILE
6	S06	Greece	SA_GREECE_ CONTINENT
7	S07	Germany N4105	SA_N4105
8	S08	Britain	SA_G98
9	S09	Britain	SA_G99
10	S0A	Northern Ireland	SA_NI_G98
11	S0B	Northern Ireland	SA_NI_G99
12	S0C	Ireland	SA_IRELAND
13	S0D	Britain	SA_G100
14	S0E	Norway	SA_NORWAY
15	S0F	Czech Republic	SA_CZECH
16	S10	Poland	SA_POLAND
17	S11	Hungary	SA_HUNGARY
18	S12	Belgium	SA_BELGIUM
19	S13	Spain	SA_SPAIN
20	S14	Sweden	SA_SWEDEN
21	S15	Denmark	SA_DEMARK_DK1
22	S16	Denmark	SA_DEMARK_DK2
23	S17	Denmark	SA_DEMARK_ TR331_DK1
24	S18	Netherlands	SA_EN50438
25	S19	France	SA_FRANCE
26	S1A	North America	SA_IEEE1547_1
27	S1B	North America	SA_US_RULE21
28	S1C	North America	SA_US_RULE14_ HECO
29	S1D	(NULL)	SA_EN50549
30	S1F	South Africa	SA_NRS097
31	S1G	Lithuania	SA_LIETUANIA
32	S20	Brazil	SA_BRAZIL
33	S21	Latvia	SA_LATVIJA

34	S22	(NULL)	SA_N4110_BDEW
35	S23	Taiwan	SA_TAIWAN_TPC
36	S24	Taiwan	SA_TAIWAN_VPC
37	S25	Pakistan	SA_PAKISTAN
38	S26	India	SA_INDIA
39	S27	Thailand_MEA	SA_MEA
40	S28	Thailand_PEA	SA_PEA
41	S29	Vietnam	SA_VIETNAM_EVN
42	S2A	Greek Island	SA_GREECE_ISLAND
43	S2B	New Zealand	SA_NEWZEALAND
44	S2C	France VDE0126	SA_FRANCE_ISLAND
45	S2D	Guyana, France	SA_FRANCE_GUIANA

6.4 APP operation and equipment distribution network

Users can monitor and set the AHW -6~10KTHD- G1 series inverters through the HaiPower APP, which can be downloaded by scanning the QR codes below.

HaiPower

IOS

HaiPower

Android

Scan the QR code below to download the User Manual for the HaiPower APP.

HaiPower

Manual EN

7. Attention to the Installation Environment, Maintenance, and Cleaning

When the AHW inverter works in a high-temperature environment, the heat dissipation performance is very important, because good heat dissipation can reduce the possibility for the AHW inverter to shut down. Inverters of the AHW series can naturally cool down since they are not equipped with fans. Hot air is emitted from the top of the radiator with the battery used in the IP65 environment. Please pay attention to the temperature of the installation environment to ensure the battery safety and the machine's normal operation.

 NOTE	• Please do not put the battery into fire, which may lead to an explosion.
 NOTE	• Please do not open or damage the battery because the electrolyte it releases is harmful to the skin and eyes and may be poisonous.
 NOTE	• The battery presents a risk of electric shock and high short-circuit current.

Please pay attention to the following when using the battery:

1. Take off your watch, ring, or other metal objects.
2. Use tools with insulated handles.
3. Wear rubber gloves and boots.
4. Do not place tools or metal parts on the battery.
5. Disconnect the charging power supply before connecting or disconnecting the battery terminals.
6. Check if the battery is grounded by mistake. If it is accidentally grounded, please remove the power supply from the ground. Contact with any part of the grounded battery may lead to electric shock. If such grounding is removed during installation or maintenance, the possibility of such shock can be reduced (applicable to equipment without a grounded power circuit and remote battery power supply).

The failure of the AHW inverter to operate due to overheating or overcooling can be troubleshot as follows:

- Check whether the radiator air duct is properly installed. Install it in a proper position.
- Check whether the battery temperature is too high because a high battery temperature can also lead to the failure of operation. At this time, please ventilate and cool the battery.
- If the temperature is low, low-temperature protection for the battery will also be activated, and the battery will start to output with a small load at a low temperature. The system will work normally when the temperature returns to normal. Please wait patiently.
- If the temperature is too low, low-temperature protection for the battery will also be activated. Please pay attention to the range of working temperatures listed in the Instructions for Use.
- The battery should be repaired or supervised by personnel familiar with the battery and the precautions.
- Please replace the battery with a battery or battery pack of the same model and quantity.

 NOTE	• All the above actions should be operated by professionals. Please make sure the whole system is shut down if these tasks need to be performed.

8. Troubleshooting

Our products have been rigorously tested before factory shipment. In case of any operational difficulties during the installation, please check the Q&A.

When the AHW inverter malfunctions, please inform our company in time and provide related AHW information. Our professional after-sales service personnel will be available to help you.

What related AHW information you should provide includes:

- Serial No.
- Model
- Information on LED indicators
- Brief description of the problem
- Battery voltage
- PV input voltage and power per string
- Grid voltage and frequency
- Description of the reason for the failure (the specific situation, if possible)
- Past occurrence of the problem
- The occurrence time of failure. Is it the first installation?

Battery information includes:

- Battery capacity
- Battery output voltage
- Battery serial No.

List of system faults information and suggested troubleshooting

Alarm message		
Error message	**Description**	**Suggestions**
Alarm 100	Abnormal ammeter communication	1. Check whether the connection between the ammeter and inverter is normal. 2. Check whether the distance between the ammeter and inverter is within the specification range. 3. Restart the inverter and ammeter for reconnection. 4. If the alarm message still exists, please contact the manufacturer.
Alarm 101	Reverse connection of ammeter	1. Check whether the ammeter is reversely connected. 2. If the alarm message still exists, please contact the manufacturer
Alarm 102	Current transformer (CT) reverse connection	1. Check whether CT is reversely connected. 2. If the alarm message still exists, please contact the manufacturer.
Alarm 103	No utility power	1. Please confirm whether the grid is lost. 2. If the alarm message still exists, please contact the manufacturer.
Alarm 104	The grid voltage exceeding the allowable range	1. Test the grid voltage and restart. 2. If the alarm message still exists, please contact the manufacturer.
Alarm 105	The grid frequency exceeding the allowable range	1. Test the grid frequency and restart. 2. If the alarm message still exists, please contact the manufacturer.
Alarm 302	Low battery SOC	Low battery. Please charge it.
Alarm 305	Low battery voltage	1. Check the battery voltage. 2. If the alarm message still exists, please contact the manufacturer.
Alarm 502	Abnormal reading and writing of EEPROM	1. Restart the inverter. 2. If the alarm message still exists, please contact the manufacturer.

Fault message		
Error message	**Description**	**Suggestions**
Error 100	The grid voltage exceeding the allowable range	1. Test the grid voltage and restart. 2. If the fault message still exists, please contact the manufacturer.
Error 101	The grid frequency exceeding the allowable range	1. Test the grid frequency and restart. 2. If the fault message still exists, please contact the manufacturer.
Error 102	No utility power connected	1. Check the wiring connection on the grid side after shutdown. 2. If the fault message still exists, please contact the manufacturer.
Error 103	Excessive DC component in output current	1. Restart the inverter. 2. If the fault message still exists, please contact the manufacturer.

Error 104	Abnormal NE voltage	1. Check whether the neutral wire on the inverter side with a negative grounding of PV is short-circuited with the ground wire and whether the output side is isolated by a transformer. 2. If the fault message still exists, please contact the manufacturer.
Error 200	Low off-grid output voltage	1. Restart the inverter. 2. If the fault message still exists, please contact the manufacturer.
Error 201	Excessive off-grid output voltage	1. Restart the inverter. 2. If the fault message still exists, please contact the manufacturer.
Error 202	Short circuit in off-grid output	1. Restart the inverter. 2. If the fault message still exists, please contact the manufacturer.
Error 203	Overload in off-grid output	1. Restart the inverter. 2. If the fault message still exists, please contact the manufacturer.
Error 204	Abnormal output DC component offset voltage	1. Check whether the battery terminal is reversely connected. 2. If the fault message still exists, please contact the manufacturer.
Error 300	Reverse polarity of battery	1. Restart the inverter. 2. If the fault message still exists, please contact the manufacturer.
Error 301	Battery open circuit	1. Check the battery terminal wiring. 2. If the fault message still exists, please contact the manufacturer.
Error 305	Excessive battery voltage	1. Check whether the battery voltage is normal. 2. If the fault message still exists, please contact the manufacturer.
Error 307	Abnormal battery communication	1. Check whether the lithium battery is turned on. 2. Check whether the connection between the battery and inverter is normal.
Error 400	Excessive PV input voltage	1. Disconnect the DC switch immediately and check the voltage. 2. If the fault message still exists after the voltage is back to normal, please contact the manufacturer
Error 401	Low panel insulation resistance according to ISO standards	1. Check whether the panel shell is grounded after shutdown. 2. If the fault message still exists, please contact the manufacturer.
Error 402	Excessive residual current for the GFCI (Ground Fault Circuit Interrupter)	1. Restart the inverter. 2. If the fault message still exists, please contact the manufacturer.
Error 403	Panel short circuit	1. Check whether the PV Input terminal is reversely connected. 2. Restart the inverter. 3. If the fault message still exists, please contact the manufacturer.
Error 404	PV reverse connection	1. Check whether the PV is reversely connected. 2. If the fault message still exists, please contact the manufacturer.

Error 500	Abnormal bus voltage	1. Restart the inverter. 2. If the fault message still exists, please contact the manufacturer.
Error 501	Abnormal bus voltage sampling	1. Restart the inverter. 2. If the fault message still exists, please contact the manufacturer.
Error 502	Abnormal internal communication	1. Check the wiring connection on the grid side after shutdown. 2. If the fault message still exists, please contact the manufacturer.
Error 503	Abnormal automatic detection	1. Restart the inverter. 2. If the fault message still exists, please contact the manufacturer.
Error 504	Unmatched mode	1. Restart the inverter. 2. If the fault message still exists, please contact the manufacturer.
Error 505	Abnormal connection of the temperature sensor	1. Check whether the temperature sampling module is connected properly after shutdown.
Error 506	Overheat protection	1. Restart the inverter. 2. If the fault message still exists, please contact the manufacturer.
Error 507	Abnormal Relay	1. Restart the inverter. 2. If the fault message still exists, please contact the manufacturer.
Error 508	Overcurrent protection	1. Restart the inverter. 2. If the fault message still exists, please contact the manufacturer.
Error 509	Anti-reflux output timeout	1. Restart the inverter. 2. If the fault message still exists, please contact the manufacturer.
Error 510	Unmatched software version	1. Restart the inverter. 2. If the fault message still exists, please contact the manufacturer.

9. Start and Shut Down AHW System

9.1 Start AHW system

Users can start the AHW inverter with the following steps:

1. Connect to PV.
2. Connect to the grid.
3. Connect to the battery.
4. Turn on the grid, battery, and PV switch successively.
5. When the indicator turns green, it means the AHW inverter starts successfully.

9.2 Disconnect AHW system

1. Turn off all circuit breakers and switches.
2. Disconnect PV.
3. Disconnect the inverter.
4. Disconnect the battery.
5. Pull up the AC plug connection.
6. After the LED is off, AHW is completely turned off.

10. EU Declaration of Conformity (DoC)

In compliance with the EU directives:

We confirm that the inverters and accessories described in this document comply with the above EU directives.

11. Discontinuation of Use

11.1 Remove the energy storage system

1. Disconnect the AHW inverter, as shown in Section 9.
2. Disconnect cables on the AHW inverter.

- Pay attention to the heating of AHW casing to prevent burns
- Wait for 20 minutes until the AHW cools down before disassembling!

3. Unscrew all connecting cables.
4. Unscrew the screws of the radiator and wall-mounted brackets and remove the machine from the wall.

11.2 Pack the AHW inverter

Generally, the AHW inverter is sealed in a packing box with adhesive tape. If the AHW inverter cannot be reused, please use a cheap carton for packing. The carton must meet the dimensions of the inverter and support the overall weight of the energy storage system.

11.3 Store the AHW inverter

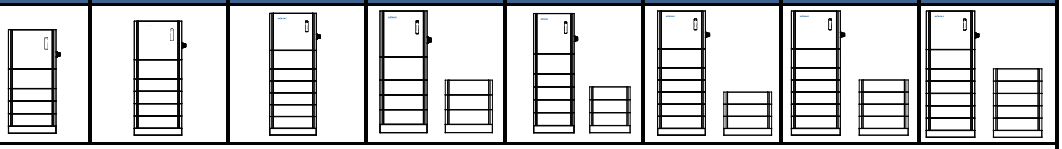
The AHW inverter should be stored in a dry environment with a temperature kept between -10 °C and +45 °C

11.4 Dispose of the AHW inverter

Do not dispose of the high-voltage inverter with domestic garbage. Please follow the applicable regulations on electronic waste disposal at the installation site at that time. Ensure that used equipment and any accessories are disposed of appropriately.

12.Product Specifications

12.1 Product description of energy storage system of AHW series.

System Parameters	AHW-6~10KTHD-G1-B3	AHW-6~10KTHD-G1-B4	AHW-6~10KTHD-G1-B5	AHW-6~10KTHD-G1-B6	AHW-6~10KTHD-G1-B7	AHW-6~10KTHD-G1-B8	AHW-6~10KTHD-G1-B9	AHW-6~10KTHD-G1-B10
System Schematic								
Inverter Module	AHW-6/7/8/10KTHD-G1							
NO. of Inverter Modules	1							
Battery Module	AHW-2.56HD-L							
NO. of Battery Modules	3	4	5	6	7	8	9	10
Battery Total Energy(kWh)	7.68	10.24	12.8	15.36	17.92	20.48	23.04	25.6
Battery Voltage Range(V)	129.6~168.48	172.8~224.64	216~280.8	259.2~336.96	302.4~393.12	345.6~449.28	388.8~505.44	432~561.6
Max. Charge/Discharge Current(A)	25							
Ingress Protection	IP65							
Operating Temperature Range (℃)	-10~+45							
Relative Humidity	5%~95%							
Mounting Method	Floor installation							
Noise Emission(dB)	⩽35							
Cooling Method	Natural							
Altitude(m)	⩽3000 (>2000, derating)							
Dimension of The System (W*H*D)(mm)	650*1320*240	650*1480*240	650*1640*240	650*1320*240 650*570*240	650*1480*240 650*570*240	650*1640*240 650*570*240	650*1640*240 650*730*240	650*1640*240 650*890*240
Dimension of Hbox (W*H*D) (mm)	650*250*240							
Dimension of Base (W*H*D) (mm)	650*90*240							
Display	LED&App							
Communication	RS485/CAN/USB/WIFI/GPRS							
Product Ordering Model*1	[Inverter:AHW-6/7/8/10KTHD-G1] + N*[AHW-2.56HD-L] + HBox + Base							

Inverter Module	AHW-6KTHD-G1	AHW-7KTHD-G1	AHW-8KTHD-G1	AHW-10KTHD-G1
Solar Input Data				
Max. PV Input Power(W)	9000	10500	12000	15000
Max. Input Voltage(V)	1000			
Start-up Voltage(V)	120			
Nominal Input Voltage(V)	600			
MPPT Operating Voltage Range(V)	120~1000			
Max. Input Current per MPPT(A)	16/16			
Max. Short Circuit Current per MPPT(A)	20/20			
Number of MPPT	2			
Number of Strings per MPPT	1/1			
AC Input Data				
Nominal Input Voltage(V)	230/400, 3L/N/PE			
Input Voltage Range(V)	310~476			
Max. AC Current(A)	9.1	10.6	12.2	15.2
Max. Apparent Power(VA)	6000	7000	8000	10000
AC Frequency/Range (Hz)	50/45~55,60/55~65			
Battery Data				
Battery Voltage Range(V)	100~600			
Max. Charge/Discharge Current(A)	25			
Max. Charge/Discharge Power(W)	6000	7000	8000	10000
Number of Battery Input	1			
AC Output Data(On-Grid)				
Nominal Output Power(W)	6000	7000	8000	10000
Max. Apparent Output Power(VA)	6000	7000	8000	10000
Nominal Output Voltage(V)	230/400, 3L/N/PE			
Nominal Grid Frequency/Range(Hz)	50/45~55,60/55~65			
Max. Output Current(A)	9.1	10.6	12.2	15.2
Power Factor	~1(Adjustable from 0.8 leading to 0.8 lagging)			
THDi(nominal power)	< 3%			
AC Output Data(Back-UP)				
Nominal Output Power(W)	6000	7000	8000	10000
Max. Apparent Power(VA)	6000	7000	8000	10000
Nominal AC Voltage(V)	230/400, 3L/N/PE			
Nominal Grid Frequency(Hz)	50/60			
Max. Output Current(A)	9.1	10.6	12.2	15.2
Switch time(ms)	< 10			
THDv (@linear load)	< 3%			
General Data				
Dimension (W*H*D) (mm)	650*500*240			
Battery Module	**AHW-2.56HD-L**			
Battery Type	LPF			
Battery Module Energy(kWh)	2.56			
Battery Module Voltage(V)	51.2			
Dimension (W*H*D)(mm)	650*160*240			

*1: If purchasing 6 or more battery modules, an additional base needs to be added

12.2 Appendix

The figure below shows the list of optional accessories for the energy storage system. Please contact installer Technology Co., Ltd. or your dealer to make an order. (P/N is for reference only and may be subject to change.)

Name	Description	P/N
Wi-Fi	For data recording	-

13. Contact

For any technical issues with our products, please call the hotline or contact your dealer. We need the following information to help you as necessary:

1. AHW inverter's serial No.
2. AHW inverter module information
3. AHW inverter's communication mode
4. AHW inverter's fault message code
5. AHW inverter's display
6. HV box's serial No.
7. Battery capacity and serial No.