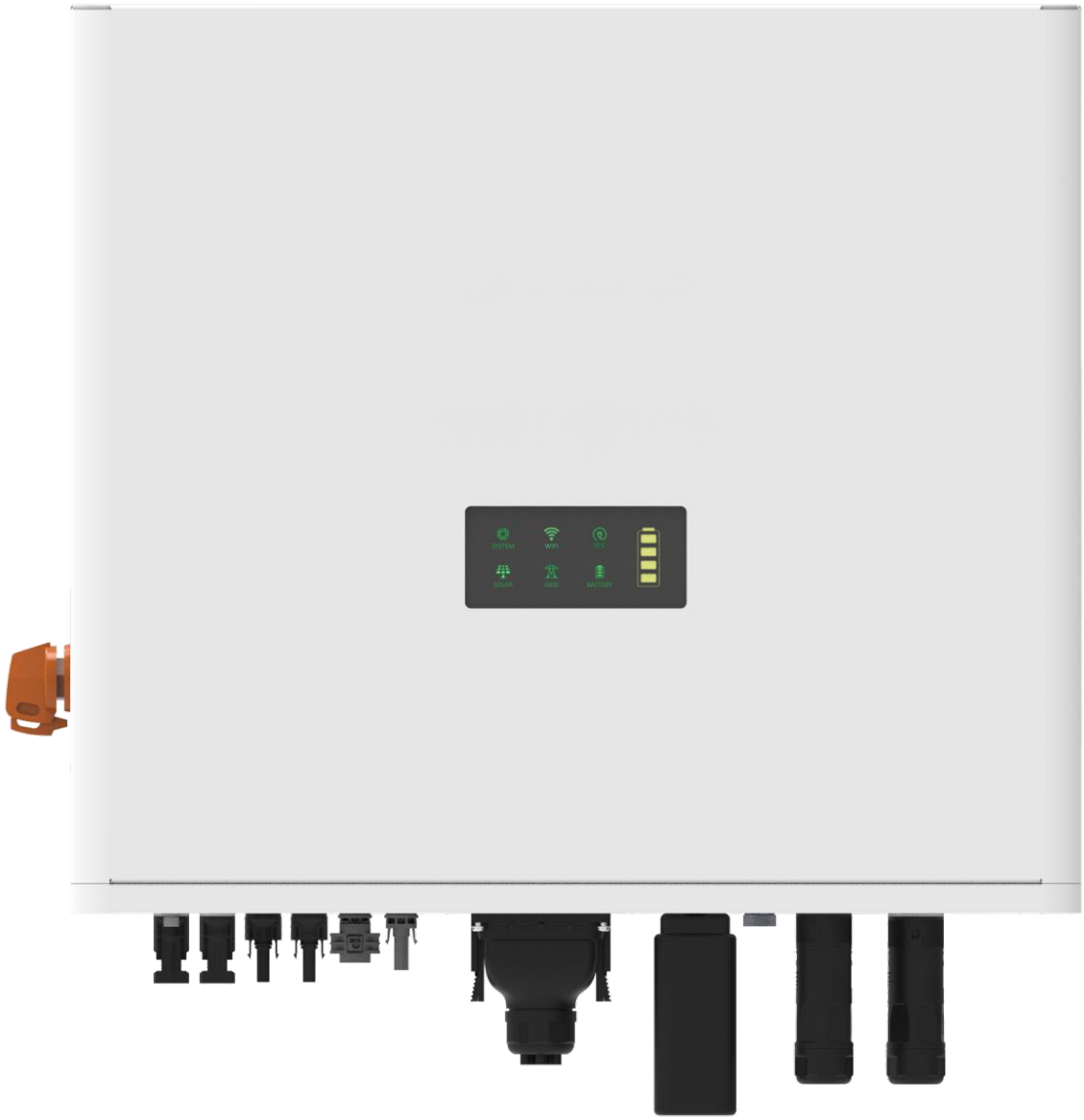


User Manual

Three Phase Hybrid Inverter

V1.4

Note:

This document is subject to irregular updates due to product upgrades or other reasons. Unless otherwise specified, this document should not be used instead of the safety precautions described in the product labels or User Manual. All instructions in this document are for reference only.

Contents

1. Preface

This Manual is considered as one part of the AE Hybrid product series. It introduces the assembly, installation, commissioning, maintenance and troubleshooting of the products. Before operation, please read this Manual carefully to learn the product safety information and grasp the product functions and characteristics. The document is subject to irregular updates. The latest information and more product information can be obtained from the official website.

1.1 Applicable products

This document is applicable to the following inverter models:

Hybrid inverter

• AE5K-H-T
• AE6K-H-T
• AE8K-H-T
• AE10K-H-T

1.2 Applicability

This document is intended for qualified personnel. Only qualified personnel are allowed to carry out those activities described in this document.

1.3 Sign definition

This Manual contains the following types of safety instructions and general information as described below:

⚠ Danger
Indicates a highly potential hazard which may result in death or serious injury if not avoided.
⚠ Warning
Indicates a moderately potential hazard which may result in death or serious injury if not avoided.
⚠ Caution
Indicates a low potential hazard which may result in moderate or minor personal injury if not avoided.
Note
Emphasizes and supplements the content, possibly offering tips or tricks for optimizing product use, which can help to solve a problem or save time.

1.4 Important safety instructions

⚠ Danger
• High voltage inside the inverter poses a risk of electrocution! All work may be performed by qualified electricians. • Unless otherwise supervised or guided by a dedicated person, children or individuals with physical, sensory, intellectual impairments, or lack of experience and knowledge are not allowed to operate the devices. Children should be supervised and prevented from operating the devices. • Overheating of casing components poses a risk of burns! During operation, the casing's top cover and body may become hot. Only touch the bottom cover of the casing during operation.
⚠ Warning

• Ensure the input DC voltage ≤ maximum DC voltage. Excessively high voltage may cause permanent damage to the inverter or other losses, which are not covered by warranty! • Authorized maintainers must disconnect the AC and DC power sources of the inverters before trying any maintenance, cleaning or working on any circuit connected to the inverters.
Note
• The grounding of PV modules and hybrid inverters should meet local requirements. In order to achieve an optimal protection for the system and personnel, it is recommended to connect the generator frame and other conductive surfaces through ensuring continuous conduction and grounding. • Radiation may harm your health!

- It is recommended to use only the accessories included in the inverter packages. Otherwise, fires, electric shock, or personal injuries may be caused.
- Ensure that the existing wires are intact and undamaged, and too short sizes are not allowed.
- DO NOT remove any components of the inverters that are not mentioned in the Installation Guide. The provided inverters do not contain user repairable components. For instructions on obtaining services, see the Warranty. Electric shocks or fires may be caused by unauthorized repair of the inverters, which are excluded in the Warranty.
- Stay away from flammable and explosive materials for fear of fires.
- The installation positions should be kept away from damp or corrosive substances.
- Authorized maintenance personnel must use insulating tools when installing or operating the devices. The PV modules should meet the requirements of IEC 61730 Class A.
- DO NOT touch the positive or negative pole of the PV connection device. Touching both positive and negative poles at the same time is strictly prohibited.
- The devices include capacitors, which can still be charged to a potentially lethal voltage after disconnecting the main power, battery packs, and PV power supply.
- After disconnecting the power supply, the dangerous voltage will last for up to 5 minutes.
- Be aware that electric shocks may be caused by the energy stored in the capacitors. Do not operate the inverter coupling, main power cable, battery pack cable, PV cable, or hybrid inverter while the system is powered. After disconnecting the PV power supply, batteries and main power. Wait for 5 minutes for the intermediate circuit capacitors to discharge, and then unplug the DC, battery plugs and main power couplers.

1.5 Version records

The latest version in the modification records contains the updated content from all previous version documents.

V1.0 2024-03-15

• First issue

V1.1 2024-10-14

• 5.2.2 Installation of Inverter (split unit)：Optimization installation diagram.

V1.2 2025-02-14

• 6.6 Parallel wiring scheme：Add parallel function description;

• 8.1 Description of panel indicators：Modify the color of the WIFI indicator panel.

V1.3 2025-03-14

• 7.2 Device powering on：Optimize the power on sequence.

• 9.1 Inverter power-off：Optimize the power-off sequence.

• 9.4 Fault handling：Optimize fault handling description.

V1.4 2025-08-01

• 3.3.1 System operating mode：Add Power Dispatch Mode

2. Safety Precautions

Please always follow the safety precautions mentioned in this document when operating the devices.

Note
The inverter is designed and tested to meet safety regulations. However, as an electrical device, compliance with relevant safety instructions is necessary before any operation to avoid serious injury or property damage.

2.1 General safety

Note
• Due to product upgrades or other reasons, the content of the documentation is subject to change without special agreement; the manual content does not replace safety precautions found in product labels or user manuals. All descriptions in the manual are intended as a guide to use. • Before installing the devices, read this document carefully to understand the products and precautions. • All operations on the device may be performed by professional, qualified electrical technicians who are familiar with the relevant standards and safety regulations of the project's location. • When operating the inverters, it is necessary to use insulating tools and wear personal protective equipment for the sake of personal safety. Before touching any electronic devices, wear antistatic gloves, antistatic wristbands and antistatic clothing to protect the inverters from being damaged by static. • Damage to the device or personal injury caused by not installing, using, or configuring the inverter according to the manual is not within the responsibility of the device manufacturer.

2.2 Safety of serial PV modules

⚠ Danger
Please use the DC terminal block provided with the box to connect the inverter's DC cable. Using a different model of DC terminal block may lead to serious consequences, and any resulting damage to the device is not within the responsibility of the device manufacturer.
⚠ Warning
• Ensure that the module frames and mounting system are properly grounded. • Make sure that the completed DC cable connection is firm without loose parts. • Use a multimeter to measure the positive and negative poles of the DC cables, ensuring correct polarity without reversal; and that the voltage is within the permissible range. • DO NOT connect the same serial PV modules to multiple inverters for fear of damages to them. • PV modules used with the inverter should comply with the IEC 61730 Class A standard.

2.3 Inverter safety

⚠ Warning
• Ensure that the voltage and frequency at the grid connection point comply with the inverter's grid specifications. • It is recommended to add protective devices such as circuit breakers or fuses at the AC side of the inverters. The maximum output current of the protective devices should be higher than 1.25 times that of the AC side of the inverters. • The protective earth wire of the inverter may be securely connected. When multiple inverters are paralleled, ensure that all the inverter casings' protective grounding points are connected at the same electrical potential. • If the inverter triggers a fault fewer than 5 times, it can automatically clear the fault and resume operation. After

the 5th fault trigger, the inverter will shut down for protection and will require a manual shutdown-startup command to function normally.

Danger

• After installing the inverter, ensure that labels and warning signs on the casing are clearly visible. It is prohibited to cover, alter, or damage them.
• The signs on the inverter cases are as follows:2

Symbol	Description
	CE sign. The inverters meet the applicable CE guidelines.
	TUV certified.
	RCM sign.
	High-temperature surface. The inverters will become hot during operation. DO NOT touch them during operation.
	Danger! High voltage.
	The high voltage in the inverters is life-threatening! Electrical shock hazard!
	Read the attached document before operation.
	The inverters shall not be disposed of together with domestic garbage. The disposal shall be carried out according to the local laws and regulations. They can be sent back to the manufacturer for disposal. For the disposal information, see the attached document.
	Do not operate this inverter before isolating it from the battery pack, the main power source, and the on-site PV panels.
	Connection points of protective grounding wires.
	Life-threatening high voltage. After all power sources are turned off, residual voltage remains inside the hybrid inverter, requiring 5 minutes to discharge to a safe voltage.

2.4 Battery safety

Warning

• Batteries used with the inverter should be approved by the inverter manufacturer, and a list of approved batteries can be obtained from the official website.
• Before installing the devices, read the User Manual of the batteries carefully to understand the products and precautions. The operation must be subject to the User Manual of the batteries.
• If the battery is completely discharged, strictly follow the charging instructions in the battery user manual for the corresponding model.
• The battery current may be affected by some factors such as temperature, humidity and weather conditions, etc., which may cause battery current limiting and affect the loading capacity.
• If the battery fails to start, contact the after-sales service center as soon as possible. Otherwise, the battery may

suffer permanent damage.
• Use a multimeter to measure the positive and negative poles of the DC cables for correct arrangement without reverse connection; The voltage should be kept within the allowable range.
• Do not connect the same battery pack to multiple inverters, as this may cause damage to the inverters.

2.5 Personnel requirements

Note
• Personnel responsible for installing and maintaining the equipment must first receive proper training to understand the required safety precautions and to master the correct operation techniques. • The installation, operation, maintenance and replacement of devices or components are only allowed to be carried out by qualified professionals or trained personnel.

2.6 EU declaration of conformity

Equipment with wireless communication capabilities that can be sold in the European market should meet the following directive requirements:
• Radio Equipment Directive 2014/53/EU (RED)
• Restrictions of Hazardous Substances Directive 2011/65/EU and (EU) 2015/863 (RoHS)
• Waste Electrical and Electronic Equipment 2012/19/EU
• Registration, Evaluation, Authorization and Restriction of Chemicals (EC) No 1907/2006 (REACH)
Equipment without wireless communication capabilities that can be sold in the European market should meet the following directive requirements:
• Electromagnetic compatibility Directive 2014/30/EU (EMC)
• Electrical Apparatus Low Voltage Directive 2014/35/EU (LVD)
• Restrictions of Hazardous Substances Directive 2011/65/EU and (EU) 2015/863 (RoHS)
• Waste Electrical and Electronic Equipment 2012/19/EU
• Registration, Evaluation, Authorization and Restriction of Chemicals (EC) No 1907/2006 (REACH)

3. Product Introduction

3.1 Product description

Function overview

The hybrid inverter controls and optimizes the flow of energy from PV and batteries through an integrated energy management system. During the day, PV power first supplies the load, then charges the battery, and finally, excess electricity can be fed into the grid; at night, the battery discharges to supply the load, with any shortfall supplemented by the grid; during a power outage, PV power and lithium batteries only supply off-grid loads, and grid-connected loads cannot be used. Additionally, the system supports user-set charging and discharging times to meet electricity needs.

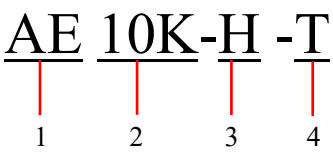
Model description

This document is applicable to the following inverter models:

Hybrid inverter

- AE5K-H-T
- AE6K-H-T
- AE8K-H-T
- AE10K-H-T

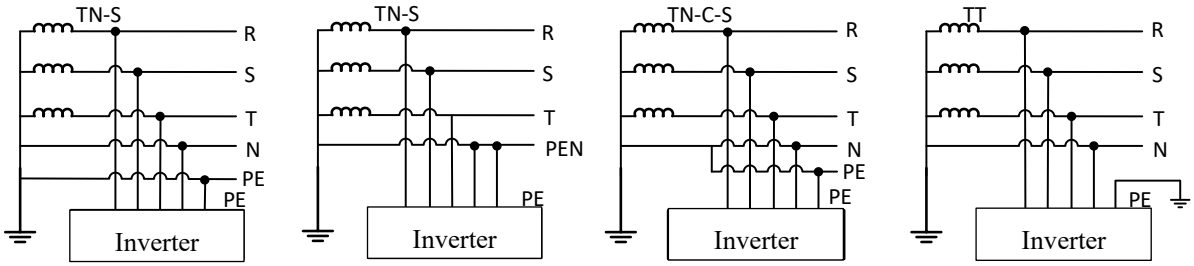
Symbolic meanings



Symbol	Meaning	Description
1	Brand code	
2	Rated capacity	10K: Rated capacity of 10kVA
3	Battery voltage	H: High voltage battery L: Low voltage battery
4	Wiring mode	T: Three-phase output; S: Single-phase output

Supported grid forms

For grid forms with an N line, the N-to-ground voltage should be less than 10V.



3.2 Application scenario

Warning

• PV systems are not suitable for devices that rely on a stable power supply, such as life-sustaining medical equipment. Please ensure that system power outages will not cause personal injury.

• If the PV system is provided without batteries, the off-grid function will not be activated.

• The battery current may be affected by some factors such as temperature, humidity and weather conditions, etc., which may cause battery current limiting and affect the loading capacity.

• When the inverter experiences overload protection for the first time, it can automatically restart. If it happens multiple times, the restart time of the inverter will be extended. To Power off for 3 minutes and then restart with power on as soon as possible, you can shut down and then Power off for 3 minutes and then restart with power on through the App.

• When the grid power is off, if the load capacity exceeds the inverter's rated power, the inverter's off-grid function will automatically shut down. To restart, ensure that the load power < inverter's rated power by turning off heavy loads.

• The EPS output port of the inverter is provided with an overload capacity and UPS function, which can be used normally for ordinary household loads in case of a grid power outage. In order to ensure the stability of UPS switching and load power supply, loads with higher starting currents such as high-power water pumps should be avoided of possible. Supportable loads are as follows:

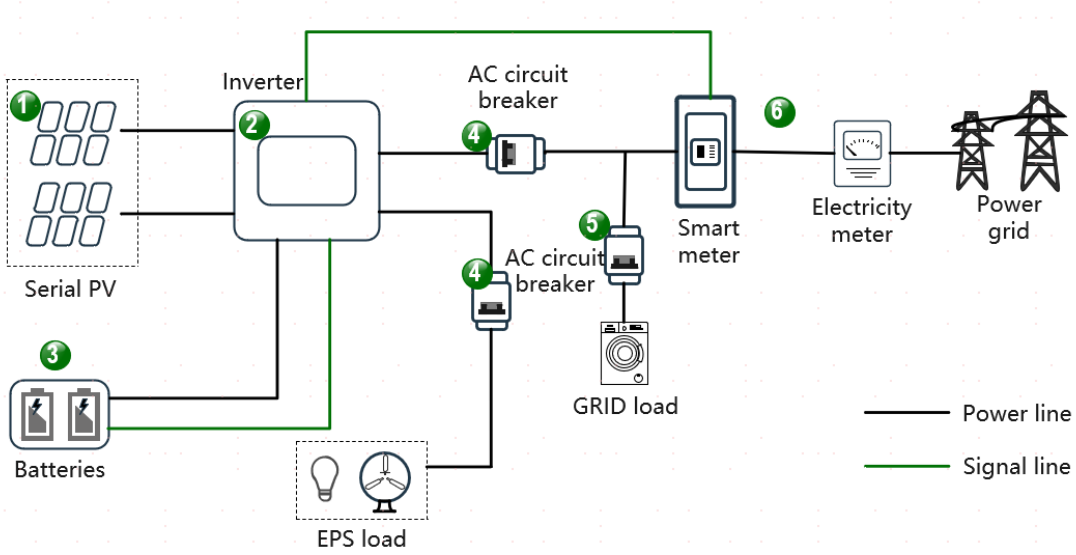
• Power of resistive loads < PCS rated power

• Power of non-linear loads < 60% of PCS apparent power. When non-linear loads are present, please contact the manufacturer to confirm PCS capacity configuration.

• For motor loads with inverters, load power < 60% of PCS unit's apparent power.

• For motor loads without frequency converters, please contact the manufacturer to confirm the PCS capacity configuration.

The specific power of motor-type loads that can be supported depends on the actual load conditions on site and requires communication with our technical staff.



No.	Component	Description
1	Serial PV modules	PV strings are made up of PV modules connected in series.
2	Inverter	Hybrid inverter.
3	Batteries	Selection should be based on the inverter and battery matching list.

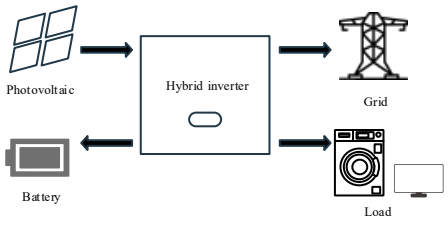
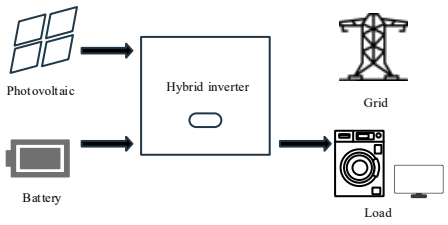
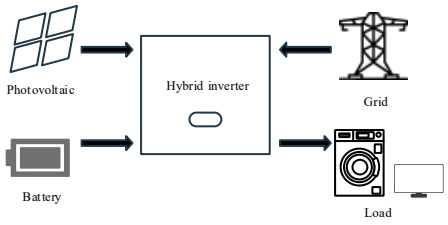
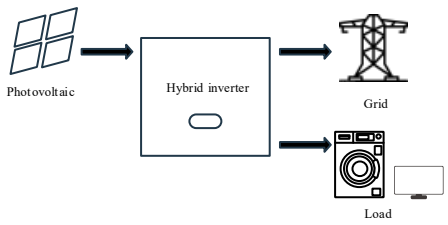
4	AC circuit breaker	• The specification of the EPS load and GRID load circuit breakers for the same model should be consistent with each other. Customers' own AC switches are recommended. • AC circuit breaker specification requirements: AE5K-H-T, AE6K-H-T, AE8K-H-T, AE10K-H-T: rated current ≥32A, rated voltage ≥400V.
5	AC circuit breaker	Specification requirements should be determined based on the actual load used.
6	Smart meter	Provided with the inverters or purchase from the inverter manufacturer.

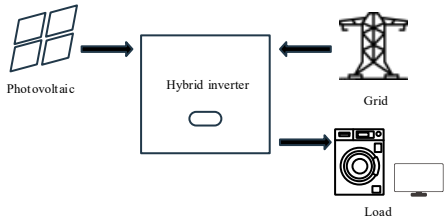
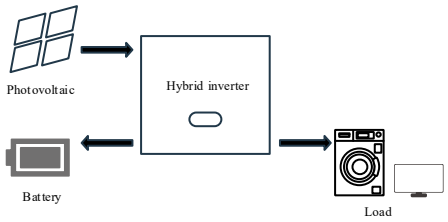
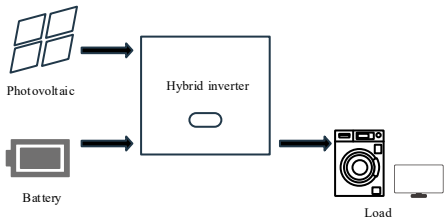
3.3 Operating mode

The hybrid inverters have multiple operating modes depending on different requirements.

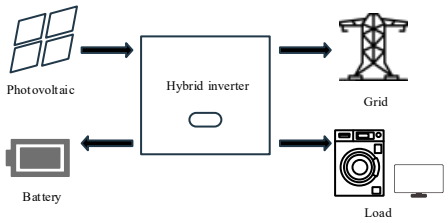
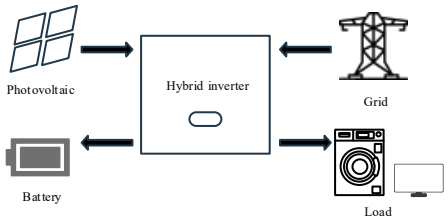
3.3.1 System operating mode

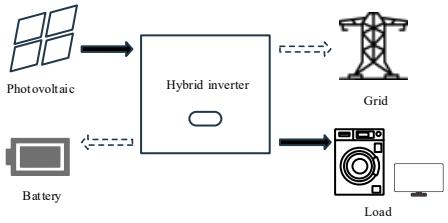
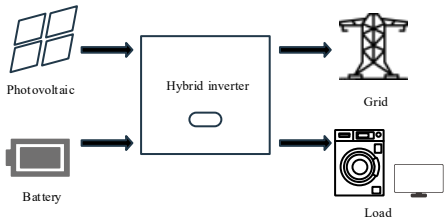
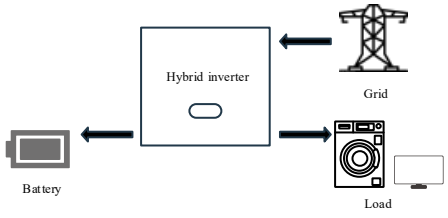
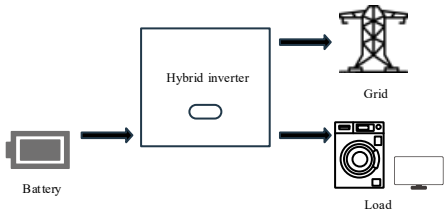
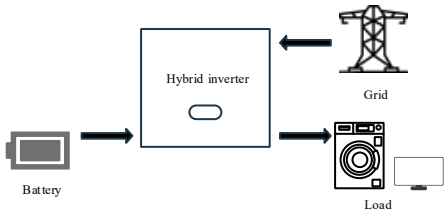
Operating mode 1: Self-Consumption

1. When the PV power supply, grid and batteries are available:	
	A. The solar energy prioritizes supplying power to the load. If the solar energy is sufficient for all connected loads, the excess solar power will charge the battery packs, then feed into the grid.
	B. The solar energy prioritizes supplying power to the load. If the solar energy is insufficient for all connected loads, the battery packs will also supply power to the load.
	C. The solar energy prioritizes supplying power to the load. If both solar and battery power are insufficient for all connected loads, the grid will also supply power to the load.
2. When PV and grid are available (without battery):	
	A. The solar energy prioritizes supplying power to the load. If the solar energy is enough, excess electricity will be fed into the grid.

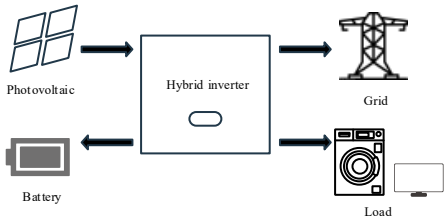
	B. The solar energy prioritizes supplying power to the load. If the solar energy is insufficient for all connected loads, the grid will also supply power to the load.
3. When the PV power supply and batteries are available (grid disconnected):	
	A. The solar energy prioritizes supplying power to the load. If the solar energy is sufficient for all connected loads, it will charge the battery pack.
	B. The solar energy prioritizes supplying power to the load. If the solar energy is insufficient for all connected loads, both the battery pack and solar will supply power to the load.

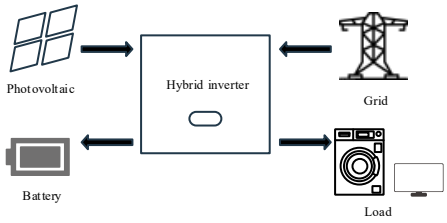
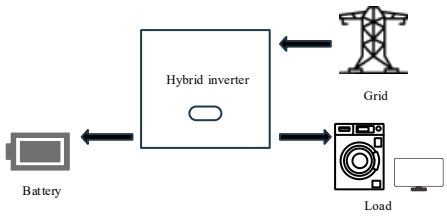
Operating mode 2: Force time use custom

1. When the PV power supply, grid and batteries are available:	
	A. During charging, the solar energy will prioritize charging the battery pack. Excess energy will supply power to the load. If solar energy is sufficient to supply power to the load and charge the battery pack, and there is still excess energy, then the surplus electrical energy will be fed into the grid.
	B. During charging, solar power will prioritize charging the battery pack. Any excess solar power will then supply the load. If solar power is insufficient for both charging the battery pack and powering the load, the grid will supply power to all connected loads.

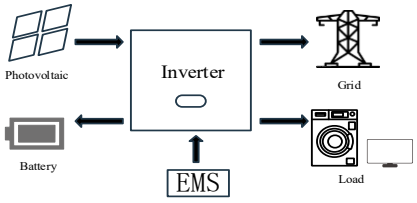
	C. When discharging, the solar energy power supply to the loads will be preferred. If the solar energy is sufficient to supply power to the loads and excess energy can still be reserved, the selection can be made depending on user preferences.
	D. During noncharging and discharging periods, the solar energy power supply to loads is preferred, while the excess energy will supply power to the grid.
2. When the grid and battery are available (with PV generation disconnected):	
	A. During charging, the grid will charge the battery and simultaneously supply power to the connected load.
	B. During discharge, if the load's power demand is less than the battery pack's capacity, the battery pack will prioritize supplying power to the load, and excess energy will be fed into the grid.
	C. During discharge, if the load's power demand exceeds the battery pack's capacity, the battery pack and grid will simultaneously supply power to the load.

Operating mode 3: Back-up

1. When the PV power supply, grid and batteries are available:	
	A. Solar energy prioritizes charging the battery pack, and if there is excess solar energy, the surplus will supply power to the load. and the excess electricity quantity, if still reserved, will be fed into the grid.

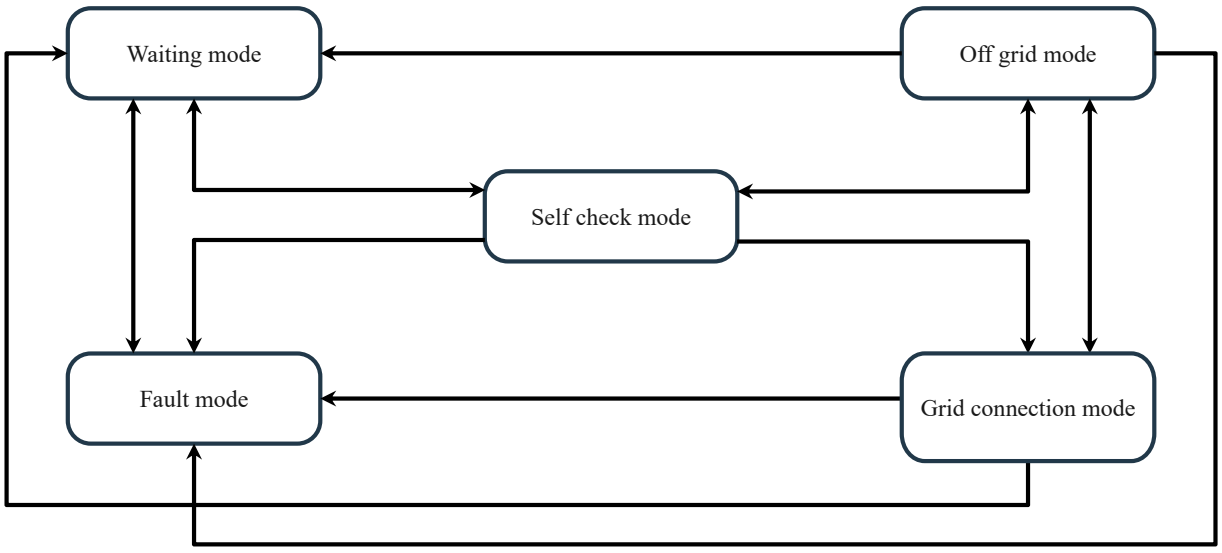
	B. Solar energy will prioritize charging the battery pack, and if there is excess solar energy, the surplus will supply power to the load. If solar energy is not sufficient to charge the battery pack and supply power to the load, then the grid will supply power to the load.
2. When the grid and battery pack are available (with PV disconnected):	
	The grid will supply power to the load while charging the battery pack.

Operating mode 4:Power Dispatch

	The output power of the inverter follows the set power: The external EMS (Energy Management System) accesses the real - time electricity price and the power of household loads, and sets the power that the inverter should output or consume

Note
If the anti-reverse flow function is activated, the system will not feed power into the grid.

3.3.2 Inverter operating mode



3.4 Functional characteristics

No.	Component	Description
1	Waiting mode	Machine power-up waiting stage • The fault mode of the inverters will be enabled in case of a fault. • When conditions are met, enter self-test mode.
2	Self-inspection mode	Before starting the inverters, self-inspection and initialization will be continued. • If the self-test fails, enter fault mode. • When the self-inspection result is accepted and the grid is normal, the grid-connected mode will be enabled. • If the self-test passes, and there is no grid/power grid anomaly: ① If batteries with sufficient power are used, the normal off-grid mode (the EPS port outputs an AC voltage) will be enabled; ② With a battery but insufficient charge, and solar energy available, enter standby off-grid mode (EPS port has no output, solar energy charges the battery) ③ If the used batteries are provided with low battery and no power from PV system is generated, the waiting mode will be enabled; ④ Without a battery, enter waiting mode
3	Grid-connected mode	The inverters are used with the grid connected. • The fault mode of the inverters will be enabled in case of a fault. When no grid connection / a grid anomaly is found, see the above steps ①~④ for operation without grid connection / a grid anomaly under the self-inspection mode.
4	Off-grid mode	Inverter operates off-grid, EPS port continues to supply power to the load • The fault mode of the inverters will be enabled in case of a fault. • If the grid returns to normal, enter grid-connected mode. • If the used batteries are provided with low battery: ① With solar power generation, enter standby off-grid mode (EPS port has no output, solar energy charges the battery). ② When no solar power generation is allowed, the waiting mode will be enabled.
5	Fault mode	If a fault is detected, the inverter enters fault mode and waits for the fault to clear before entering wait mode.

Power derating

In order to ensure the safe operation of the inverter, when the operating conditions are unsatisfactory, the inverters will automatically derate its output power.

The following are factors that may cause power derating, which should be avoided during operation if possible.

• Adverse ambient conditions, such as direct sunlight and high temperatures, etc.

• The output power percentage of the inverters has been set.

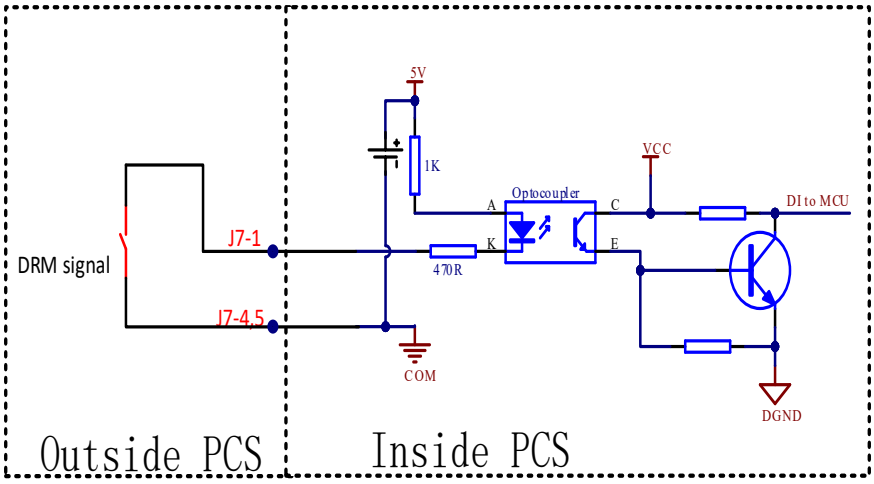
• Overfrequency and load reduction.

• High input voltage value.

DRM input control

The inverter reserves DRM input control ports for controlling the running status of PCS.

If you need to use this function, configure the external wiring as recommended in the following diagram:



The DRM interface is defined in the following table:

Port	Definition
J7-1	DRM ports, for DRM0
J7-4,J7-5	Common ports

The inverter should detect and initiate a response to all supported demand response commands, with the demand response mode described as follows:

Mode	Demand response
DRM0	Operate to disconnect devices when status is ON
DRM1	Function not open, do not wire
DRM2	Function not open, do not wire
DRM3	Function not open, do not wire

Communication

The inverters can be set through WiFi or Bluetooth near-end; They supports connecting to the cloud through WiFi or LAN for monitoring the inverter operation and power station operation, etc.

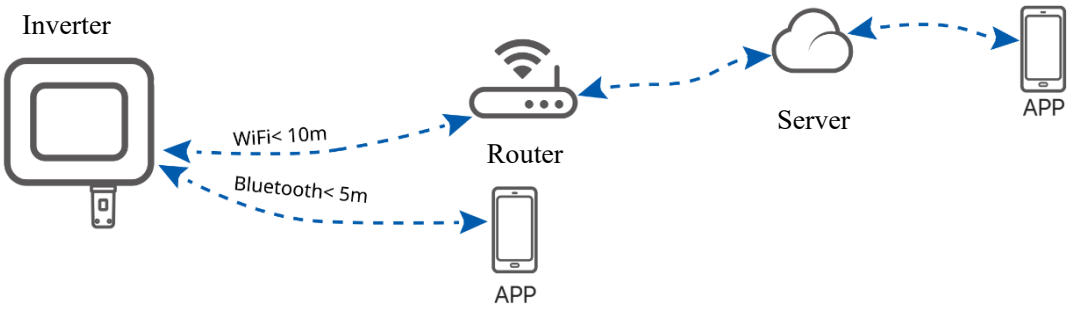
• Bluetooth: Meeting the Bluetooth 5.1 standard.

• WiFi: Supporting the 2.4G frequency band. The router should be set to the 2.4G or 2.4G/5G concurrent mode.

• The input wireless signal name of the router can contain up to 40 bytes.

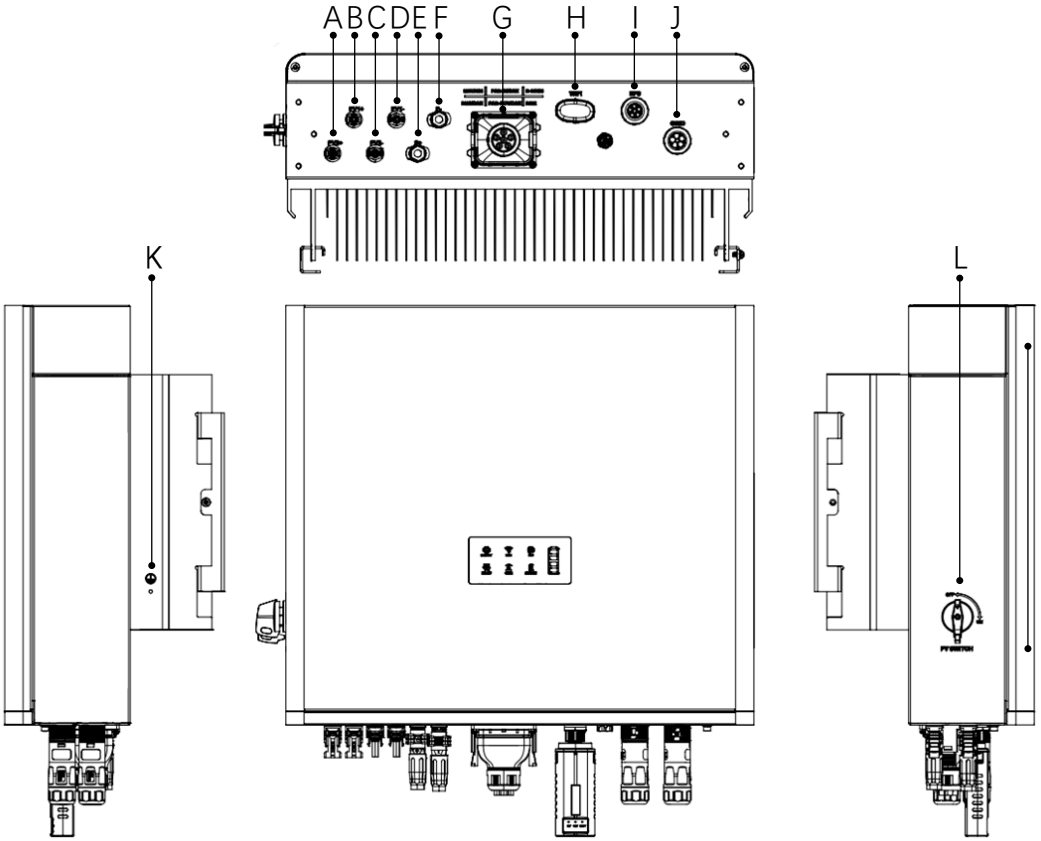
• The WiFi signal strength can be viewed through the App. When the signal strength is less than -60, it is recommended to move the router closer to the devices or remove those signal barriers to improve the signal strength.

• LAN (optional): Supporting connecting to the router through LAN communication before connecting to the cloud.



3.5 Appearance description

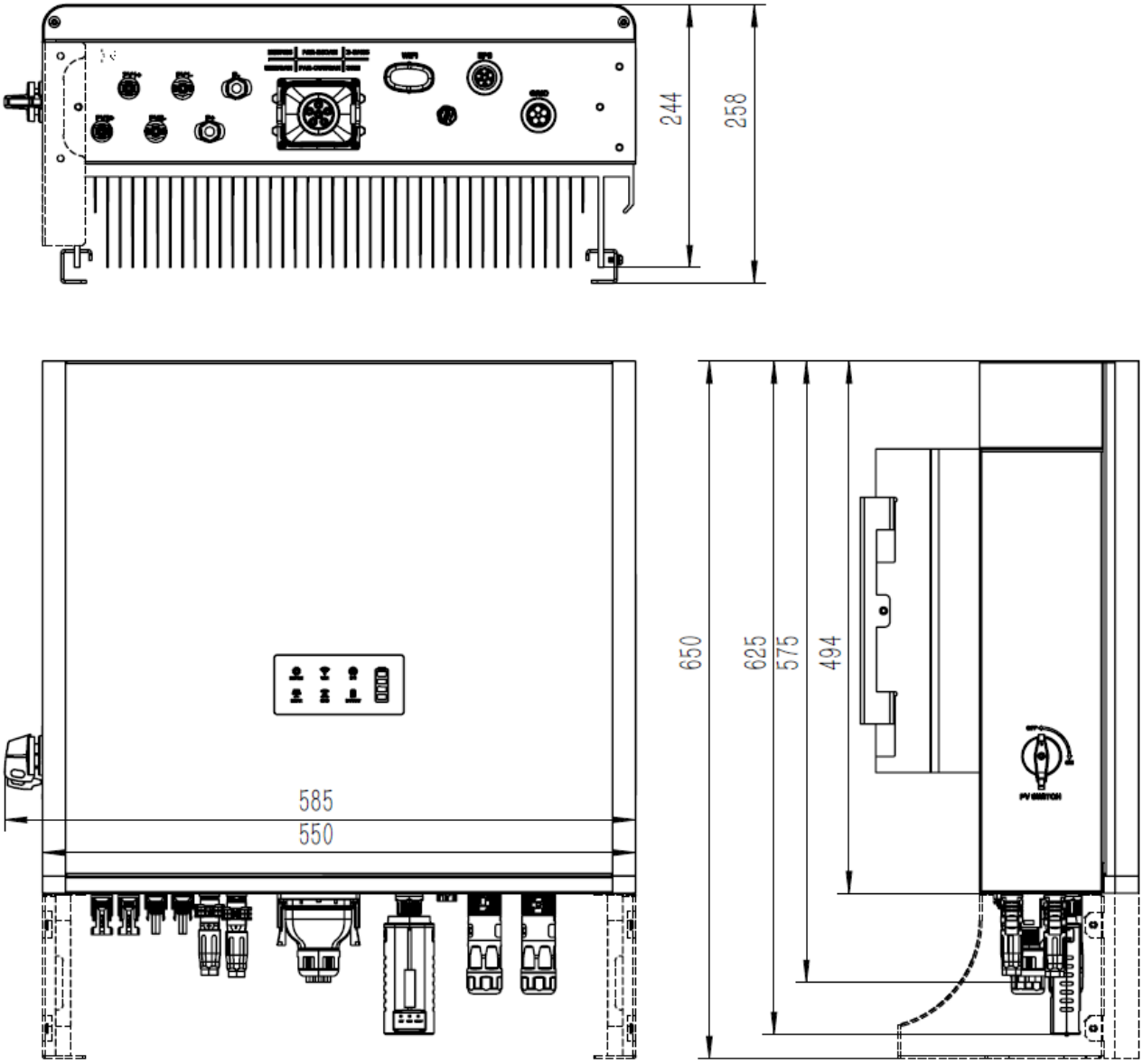
3.5.1 Appearance introduction (taking a split unit as an example)



Mark	Description
A/B	PV DC input ports (PV1+/PV2+)
C/D	PV DC input ports (PV1-/PV2-)
E	Battery DC input port P+
F	Battery DC input port P-
G	MET/485, BMS/CAN, PAR IN/CAN, PAR OUT/CAN, DB/485, DRM
H	WiFi interface, for external WiFi
I	EPS
J	GRID
K	Ground
L	PV switch

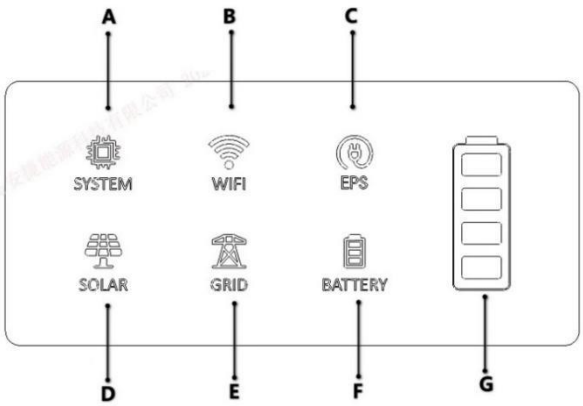
Note
1. BMS port: For communication with lithium battery's BMS.
2. DRM port: Demand response mode, select carefully according to specific needs.
3. CAN port: Parallel port.

3.5.2 Dimension Description (split unit as an example)



Unit: mm

3.5.3 Panel description



Object	Name	Description
A	SYSTEM	System operating status
B	WIFI	Network connection status

C	EPS	Load connection status
D	SOLAR	PV connection status
E	GRID	Grid connection status
F	BATTERY	Battery connection status
G	Battery level	Display battery level

3.5.4 Technical data

Model	AE5K-H-T	AE6K-H-T	AE8K-H-T	AE10K-H-T
PV input				
Recommended maximum DC power [W]	7500	9000	12000	15000
Maximum DC voltage [V]	1000	1000	1000	1000
Maximum input current [A]	16/16	16/16	16/16	16/16
Maximum short-circuit current [A]	20/20	20/20	20/20	20/20
Number of MPPT trackers	2	2	2	2
Maximum feedback current of the inverter to the PV array	0	0	0	0
DC circuit breaker	Yes	Yes	Yes	Yes
AC output				
Rated AC power [W]	5000	6000	8000	10000
Max. apparent AC power [VA]	5000	6000	8000	10000
Rated grid voltage [V]	220/380,230/400	220/380,230/400	220/380,230/400	220/380,230/400
Rated grid freq. [Hz]	50/60	50/60	50/60	50/60
Rated AC current [A]	7.6/7.3	9.2/8.7	12.2/11.6	15.2/14.5
Max. AC current [A]	8.4	10.1	13.5	16.8
Displacement power factor	0. 8 leading...0. 8 lagging	0. 8 leading...0. 8 lagging	0. 8 leading...0. 8 lagging	0.8leading...0.8 lagging
Total harmonic distortion (THDi)	< 2%	< 2%	< 2%	< 2%
Load control	Supported	Supported	Supported	Supported
AC input				
Rated AC power [W]	5000	6000	8000	10000
Rated grid voltage [V]	220/380,230/400	220/380,230/400	220/380,230/400	220/380,230/400
Rated grid freq. [Hz]	50/60	50/60	50/60	50/60
Rated AC current [A]	7.6/7.3	9.2/8.7	12.2/11.6	14.5/15.2
Max. AC current [A]	12.6	15.2	20.3	25.3
Power factor	0. 8 leading~0.8 lagging	0. 8 leading~0.8 lagging	0. 8 leading~0.8 lagging	0.8 leading~0.8 lagging
EPS output				
Rated load power [W]	5000	6000	8000	10000
Max. load power [VA]	5000	6000	8000	10000
Rated grid voltage [V]	220/380,230/400	220/380,230/400	220/380,230/400	220/380,230/400
Output frequency	50/60	50/60	50/60	50/60

Rated current of load [A]	7.6/7.3	9.2/8.7	12.2/11.6	14.5/15.2
Max. load current [A]	7.6/7.3	9.2/8.7	12.2/11.6	14.5/15.2
Switching time [s]	<20ms	<20ms	<20ms	<20ms
Total harmonic distortion (THDv)	<2%	<2%	<2%	<2%
Parallel operation	Yes	Yes	Yes	Yes
Battery parameter				
Battery type	Lithium battery/lead-acid battery pack			
Battery voltage range [V]	120-875			
Recommended battery voltage [V]	600			
Cut-off voltage [V]	120			
Maximum charging voltage [V]	875			
Maximum protection voltage [V]	875			
Maximum charge/discharge current [A]	30/30			
Peak charge/discharge current [A]	30/30			
Communications Interface	BMS(CAN)			
Efficiency				
MPPT efficiency	99.9%			
European efficiency	97.4%			
Max. efficiency	98.2%			
Max. battery charging efficiency	99%			
Max. battery discharging efficiency	98.1%			

3.5.5 Basic data

Model	AE5K-H-T	AE6K-H-T	AE8K-H-T	AE10K-H-T
Size [W/H/D] (mm)	550*575*244			
Packaging size [W/D/H] (mm)	666*656*342			
Net weight [kg]	28±1			
Gross weight [kg]	33±2			
Installing	Wall-mounted, stackable			
Operating temperature range [℃]	-25~+60 (derating at 45)			
Storage temp. [℃]	-25~+60			
Relative humidity for storage/operation	4%~95% (non-condensing)			
Altitude [m]	<3000			
Standby power consumption	<15W			
Intrusion protection	IP65(for outdoor use)			
IP grade	I			
Overvoltage cat.	III(MAINS), II(PV, Battery)			
Cooling	Natural			
Noise level	<30dB			
Inverter topology	Non-isolated			
Communications Interface	CAN/RS485/WIFI			
DRM interface	4-channel			

3.5.6 Safety and protection

Safety and protection	AE5K-H-T	AE6K-H-T	AE8K-H-T	AE10K-H-T
Overvoltage/undervoltage protection	YES	YES	YES	YES
Insulation detection protection	YES	YES	YES	YES
Grid protection	YES	YES	YES	YES
DC injection monitoring	YES	YES	YES	YES
Feedback current protection	YES	YES	YES	YES
Residual current protection	YES	YES	YES	YES
Islanding protection	YES	YES	YES	YES
Overload protection	YES	YES	YES	YES
Overheat protection	YES	YES	YES	YES

4. Device Inspection and Storage

4.1 Inspection before signing for acceptance

Before signing for product acceptance, Check the following carefully:

1. Check for any damage to the outer packages, such as deformation, holes, cracks, or other defects that may cause damage to the devices inside the packages. DO NOT open the packages if any damage is found. Contact your dealer.
2. Check the inverters for correct model. DO NOT open the packages if any discrepancy is found. Contact your dealer.
3. Check the types and quantity of deliverables for being correct, and the appearances for any damage. Contact your dealer if any damage is found.

4.2 Deliverables

⚠ Warning
• For electrical connections, please use the terminal blocks shipped with the box; damage caused by using incompatible connectors will not be covered by the warranty. • The number of accessories distributed with the packages is dependent on the product configuration.

Please confirm the materials according to the packing list inside the packaging box.

4.3 Device Storage

If the inverters are not intended for use at present, just store them according to the following requirements:

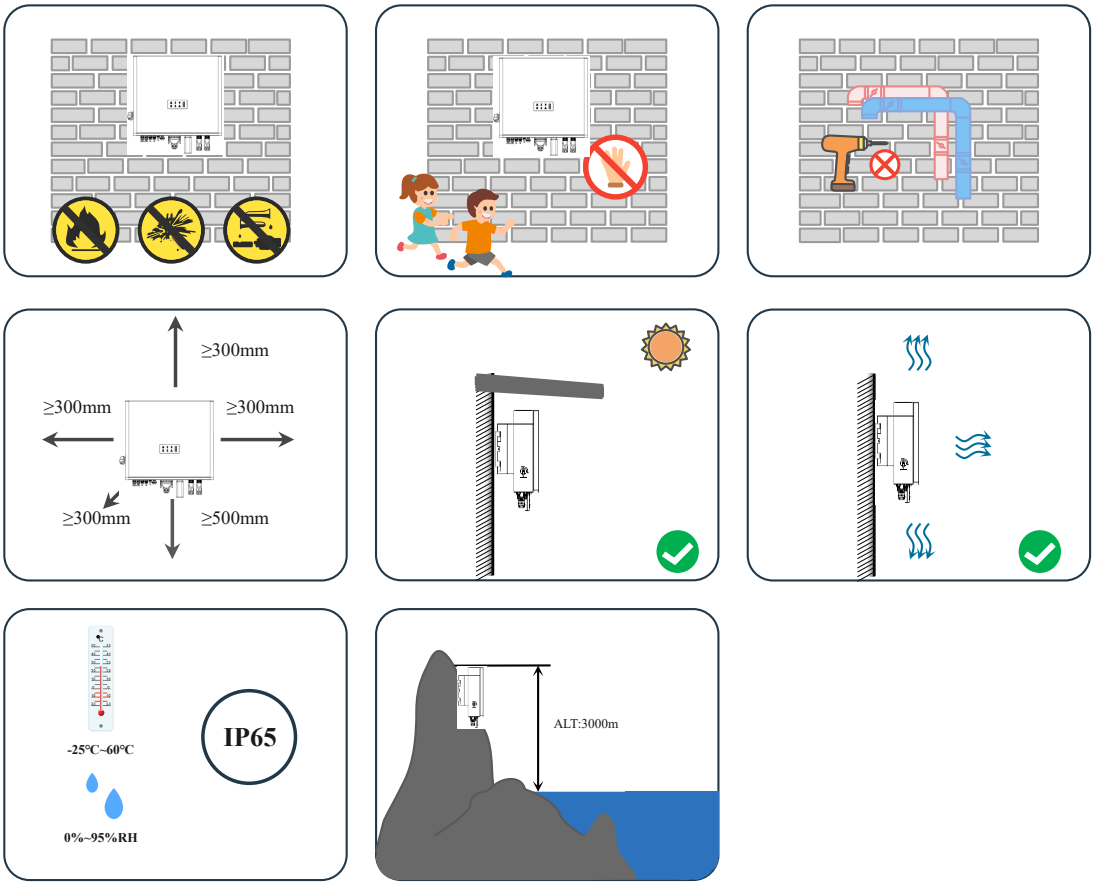
1. Make sure that the outer packages are not removed and the desiccant inside the packages exists.
2. Make sure that the storage environment is clean with appropriate temperature and humidity conditions and without condensation.
3. Make sure that the inverter stacking height and direction meet the instructions on the package labels.
4. Make sure that the inverters are not liable to tipping over after stacking.
5. After a long-term storage, the inverters must be inspected and confirmed by professional personnel before continuing to be used.

5. Installation

5.1 Installation requirements

Installation environment requirements

1. The devices should not be installed at places with flammable, explosive, or corrosive materials, etc.
2. The installation positions should be away from the reach of children and sufficient spaces should be left. There may be a high temperature on the surface of the devices during operation, DO NOT touch them for fear of burns.
3. The installation positions should be prevented from water pipes and cables in walls for fear of causing accidents during drilling.
4. The inverters should be installed at places that are away from sunlight, rain and snow, etc. It is recommended to install them at covered places. Sunshades can be set up if necessary.
5. The installation spaces must meet the device ventilation and heat dissipation and operating space requirements.
6. The IP grade of the devices should meet the requirements for indoor and outdoor installation, and the installation ambient temperature and humidity should be kept within a suitable range.
7. The installation height of the devices should be suitable for operation and maintenance. Make sure that the indicators and all labels of the devices are clear, and the wiring terminals are always ready.
8. The installation altitude of the inverters should be lower than the maximum operating altitude of 3000m.
9. Stay away from strong magnetic field places and avoid electromagnetic interference.



Installing carrier requirements

• The installation carrier must have fireproof properties and not be made of flammable materials.

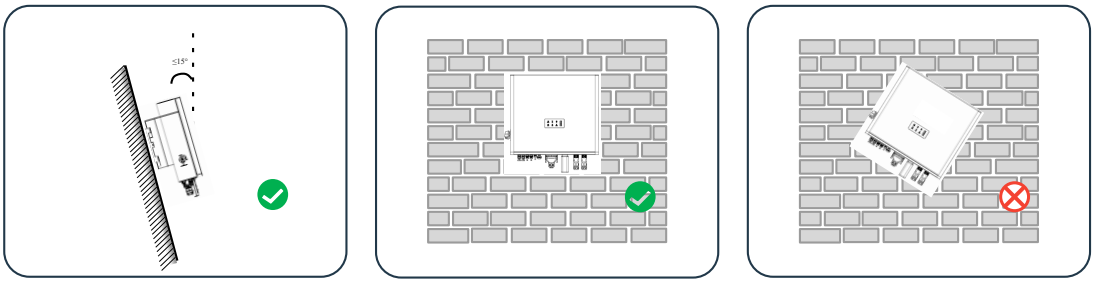
• Ensure the installation carrier is sturdy and reliable, able to support the weight of the inverter, with a load-bearing capacity not less than 35kg.

• When a device is in operation, vibration is unavoidable, and therefore, DO NOT install it on a carrier with poor sound insulation in order to prevent the noise from the device from causing inconvenience to residents in the living area during operation.

Installing angle requirements

• Recommended inverter installation angle: vertical installation, forward or backward tilt ≤ 15°.

• DO NOT install the inverters upside down, forward / backward tilt beyond the angle, or horizontally.



Installing tool requirements

It is recommended to use the following tools during installation. Other auxiliary tools can be used on site if necessary.

5.2 Installation of Inverter

5.2.1 Inverter transportation

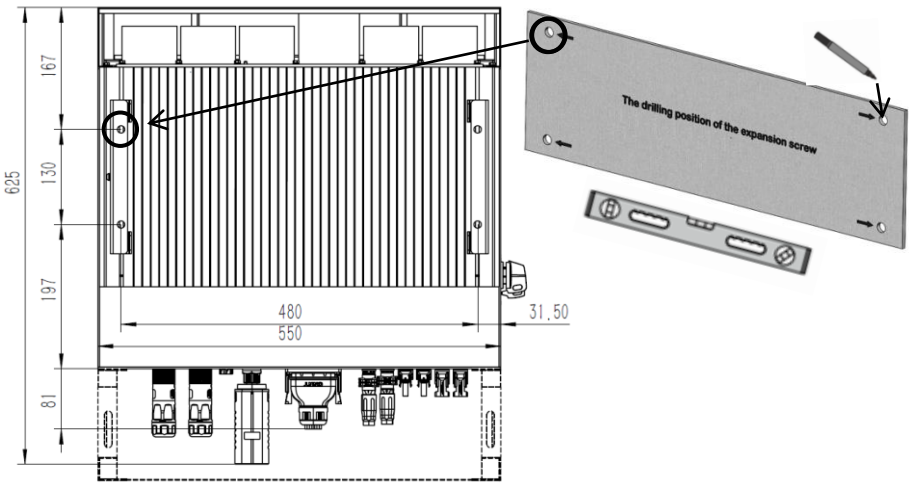
⚠ Caution
• During transportation, rotation, and installation, ensure compliance with all applicable laws, regulations, and relevant standards of the country or region. • Before installation, the inverters should be carried to the installation positions. Pay attention to the following for fear of personal injuries or device damages during handling: 1. According to the equipment weight, allocate corresponding personnel to avoid exceeding the human body's carrying capacity range and causing injury. 2. Wear safety gloves for fear of injuries. 3. Ensure the equipment is balanced during transportation to avoid falls.

5.2.2 Installation of Inverter (split unit)

Note
• During drilling, the drill location should be away from internal pipes, cables, etc., to prevent hazards. • During drilling, the holes should be away from water pipes and cables in walls for fear of accidents. • Ensure the inverter is securely installed to prevent falls and injuries to personnel.

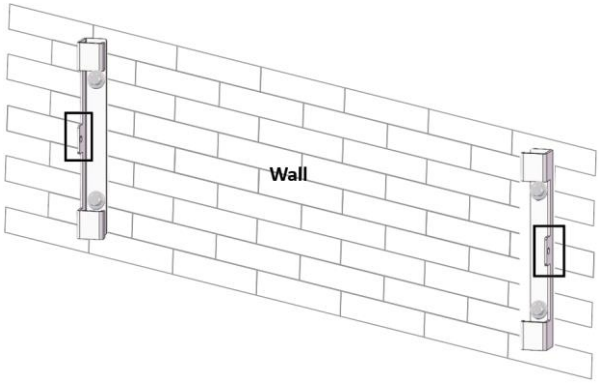
Step 1: Make sure that an inverter is at the rough installation position on the wall;

Step 2: Take out a piece of drilling positioning cardboard from a package and place it horizontally on a wall, and mark a drilling position with a marker;

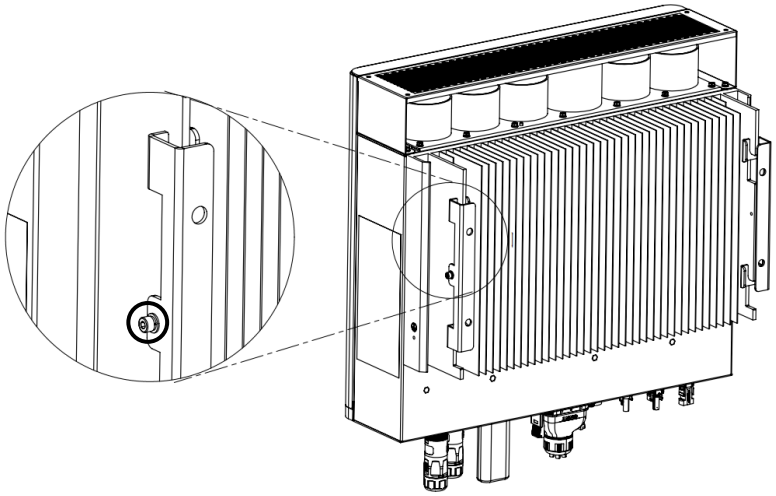


Step 3: Use a φ12 drill bit with an impact drill for drilling, ensuring the hole depth is greater than 80mm.

Step 4: Use M8X80 expansion screws to install a bracket on the wall;



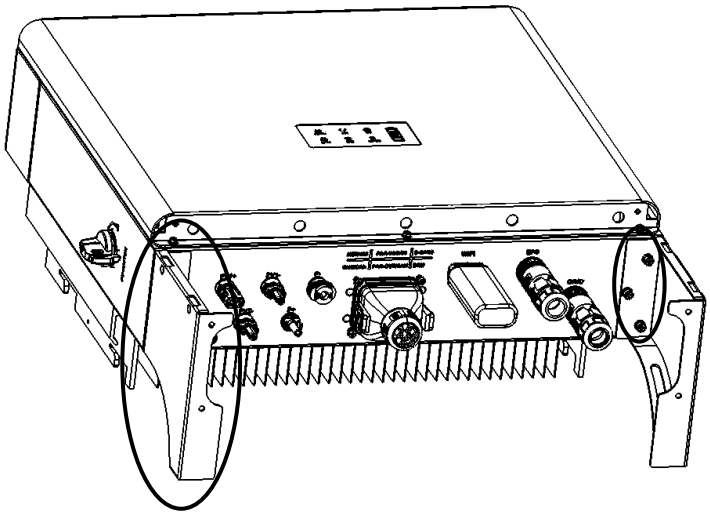
Step 5: Hang the inverter on the wall-mount bracket;
Step 6: Fix the wall-mount bracket and inverter with screws to prevent the inverter from unhooking and ensure a stable installation.



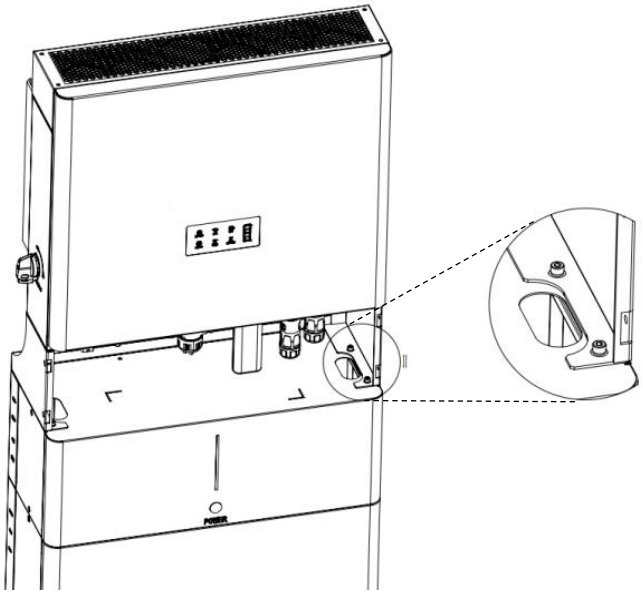
5.2.3 Installation of Inverter (all-in-one unit)

Note
• During drilling, the drill location should be away from internal pipes, cables, etc., to prevent hazards. • During drilling, the holes should be away from water pipes and cables in walls for fear of accidents. • Ensure the inverter is securely installed to prevent falls and injuries to personnel.

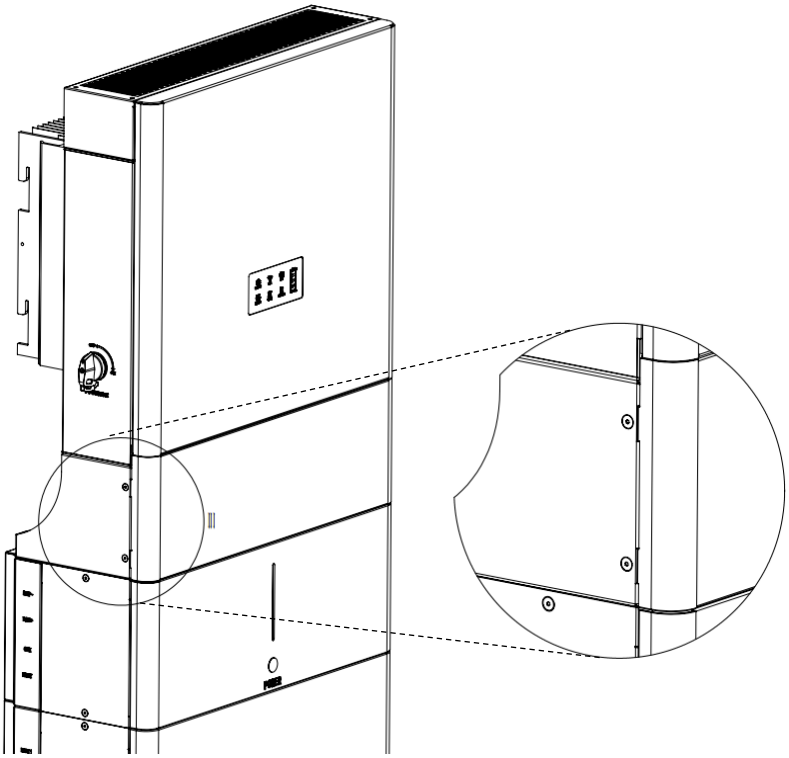
Step 1: Install the left and right base supports on the inverter box using hexagonal screws;



Step 2: Move the inverter onto an installed battery system and connect it to the PACK body through the base bolt holes;



Step 3: After connecting the harness, install the foot protection plate and fix it from the side with countersunk screws.

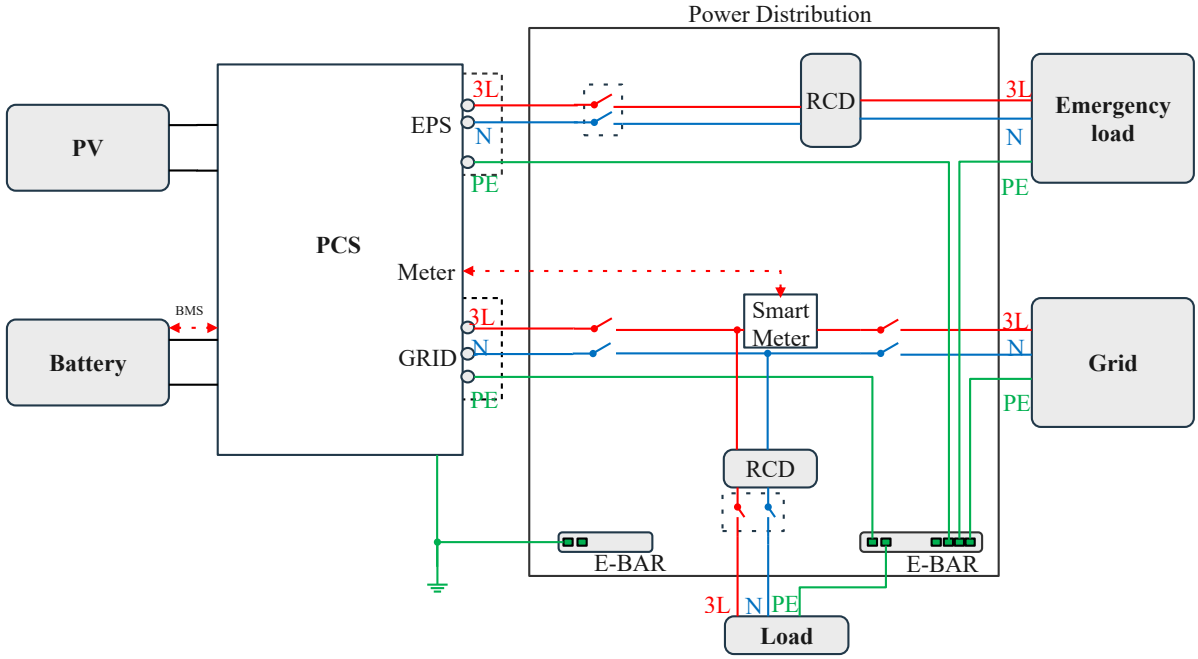


6. Electrical Connection

6.1 System wiring block diagram

Note
• According to the regulatory requirements of different regions, the wiring methods of N and PE wires of the inverter's GRID and EPS ports differ, specifically based on local regulatory requirements. • The GRID and EPS AC ports of inverters are provided with built-in relays. When the grid meets the local regulations, the built-in GRID relays are switched on; Otherwise, they are switched off. • When the inverter is powered on, the EPS AC port is live. If maintenance is needed on the EPS load, power down the inverter to avoid electric shock.

System Diagram (suitable for most countries)



Safety precautions

Danger
• All operations should comply with local laws and regulations during the electrical connection process, and the specifications of the cables and components used. • Before making an electrical connection, disconnect the DC switch and AC output switch of the inverters to ensure that the devices are powered off. Live operation is strictly prohibited, otherwise dangers such as electric shock may be caused. • Similar cables should be bundled together and arranged separately from different types of cables, prohibiting entanglement or cross arrangement. • If the cables bear too much tension, a poor wiring may be caused. When wiring, reserve a certain length of the cables before connecting them to the inverter wiring ports. • When crimping terminal connectors, ensure the cable conductor fully contacts the terminal without crimping the insulation along with the terminal, as this may prevent the device from operating or cause heating due to unreliable connection, leading to damage to the inverter's terminal block.

Note

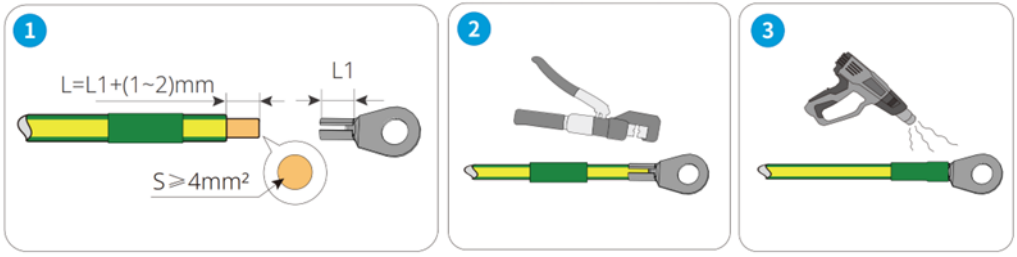
• When making electrical connections, wear personal protective equipment such as safety shoes, protective gloves, and insulating gloves as required.
• Only professionals are allowed to make electrical connection related operations.
• The cable colors in the manual's graphics are for reference only; actual cable specifications should comply with local regulations.

6.2 Grid and load connection

Connect the grounding points of each module in sequence and then tighten the grounding wires with grounding screws.

Warning

• The protective ground of the casing cannot replace the protective earth wire of the AC output. When wiring, ensure both protective earth wires are reliably connected.
• When multiple inverters are used, be sure that the protective grounding points of all inverter casings are equipotentially connected.
• To improve terminal corrosion resistance, it is recommended to apply silicone or paint on the exterior of the ground terminal after connecting the protective earth wire.
• The protective grounding wires should be provided by the user, recommended specifications:
  • Type: Outdoor copper core wire
  • Conductor cross-sectional area: 4-6 mm2



The hybrid inverter is designed specifically for three-phase power grids. Voltage is 220/380, 230/400, with a frequency of 50/60Hz. Other technical requirements should be subject to the requirements of local public grids.

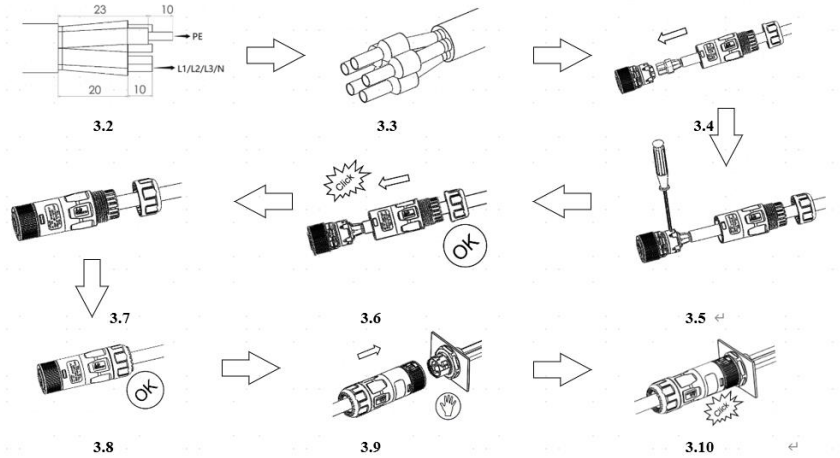
Recommended cable and miniature circuit breaker	
Cable	10AWG
Miniature circuit breaker	32A

Warning

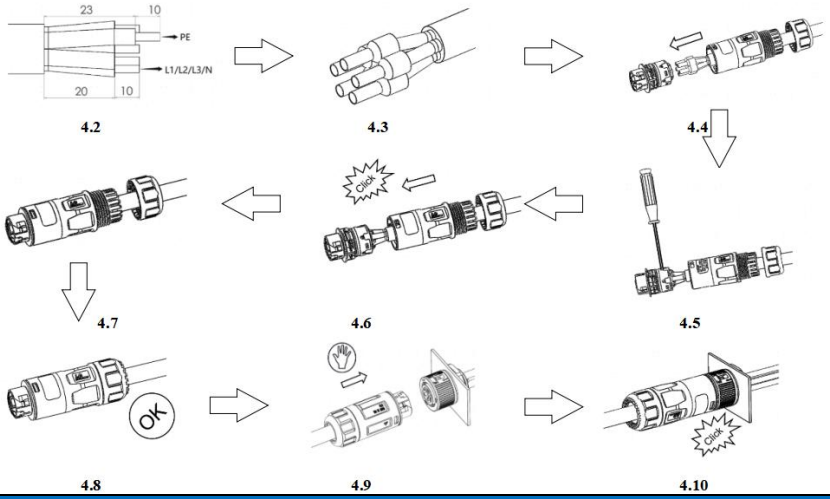
• A miniature circuit breaker should be installed between an inverter and the grid, and no direct connection of a load to an inverter is allowed.
• At final installation, a circuit breaker compliant with IEC 60947 and IEC 60947-2 standards should be installed on the device.

Step 1. Check the grid voltage.
1.1 Check the grid voltage and compare it with the allowable voltage range (see the technical data).
Step 2. Remove the waterproof cover from the inverter grid port.
Step 3. Prepare the AC grid GIRD wire.
3.1 Choose the appropriate wire (cable size: see table above).
3.2 Reserve about 20 mm of conductor material and strip 10 mm of insulation from the end of the wire.
3.3 Crimp the AC terminal connector using a crimping tool.

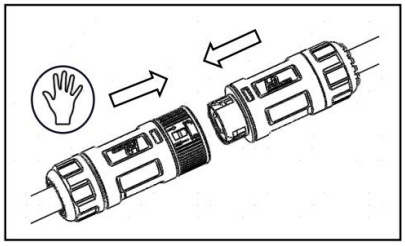
3.4 Assemble the parts onto the cable in order and insert them into the terminal hole according to the wire sequence.
3.5 Tighten the screw with a hex wrench, torque 1.2±0.1N•m.
3.6 Insert the main body into the corresponding catch and listen for a "click".
3.7 Tighten the nut with an open-end wrench (torque 2.5±0.5N•m).
3.8 Complete assembly.
3.9 Insert the female end according to the arrow indicator.
3.10 Complete installation.



Step 4. Prepare the AC load EPS wire.
4.1 Choose the appropriate wire (cable size: see table above).
4.2 Reserve about 20 mm of conductor material and strip 10 mm of insulation from the end of the wire.
4.3 Crimp the AC terminal connector using a crimping tool.
4.4 Assemble the parts onto the cable in order and insert them into the terminal hole according to the wire sequence.
4.5 Tighten the screw with a hex wrench, torque 1.2±0.1N•m.
4.6 Insert the main body into the corresponding catch and listen for a "click".
4.7 Tighten the nut with an open-end wrench (torque 2.5±0.5N•m).
4.8 Complete assembly.
4.9 Insert the female end according to the arrow indicator.
4.10 Complete installation.



Note
• Connect the AC connectors to the GRID and EPS interfaces respectively. • During the maintenance of the inverter, the GRID port can be directly plugged into the EPS port, and the power grid supplies power to the EPS load, without additional wiring through the distribution box；



6.3 PV connection

Danger

• The voltage of PV modules is very high and has reached the dangerous voltage range; comply with electrical safety rules when connecting.
• DO NOT connect the same serial PV modules to multiple inverters for fear of damages to them.
• Before connecting PV strings to the inverter, confirm the following information. Failure to do so may cause permanent damage to the inverter and lead to fire in severe cases, resulting in injury and property loss.
1. Be sure that the maximum short-circuit current and maximum input voltage of each MPPT are kept within the allowable range of the inverter.
2. Please ensure the positive pole of the PV strings is connected to the inverter's PV+, and the negative pole of the PV strings is connected to the inverter's PV-.

Warning

PV string output does not support grounding. Before connecting the PV strings to the inverter, please ensure the minimum insulation resistance of the PV strings meets the minimum insulation impedance requirement (R=maximum input voltage/30mA). If the insulation impedance value is less than this requirement, the inverter will trigger an insulation impedance alarm.

Note

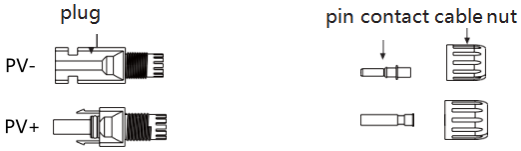
• The hybrid inverter can be connected in series with two strings of PV modules, for use with 5KW, 6KW, 8KW, 10KW systems.
• The PV modules used for connecting the inverter should meet the requirements of IEC 61730 Class A.
• Choose PV modules that are superior in function and reliable in quality.
• The open-circuit voltage and operating voltage of the series module array should be less than the maximum DC input voltage.
• The operating voltage of the DC input should be within the MPPT voltage range.

Maximum DC voltage limit				
Model	**AE5K-H-T**	**AE6K-H-T**	**AE8K-H-T**	**AE10K-H-T**
Maximum DC voltage (V)	1000			
MPPT voltage range (V)	180-900			

Connecting PV:

Step 1. Check the PV modules to ensure that they are in an open circuit state and that the PV+ and PV- ports of the PV modules are correct.

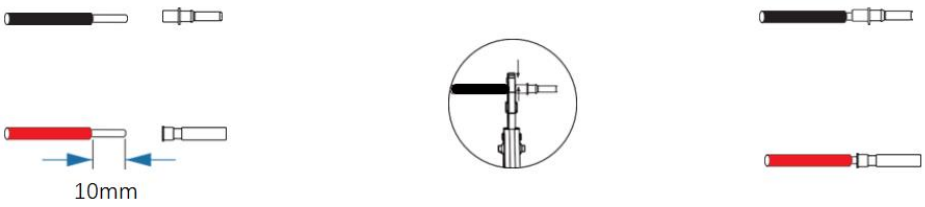
Step 2. Separate the DC connector.



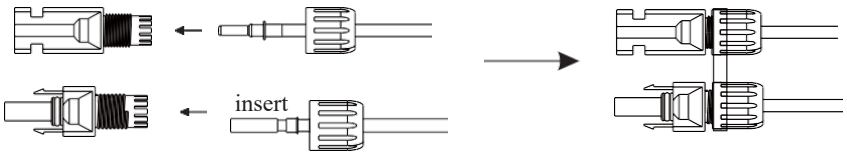
Step 3. Wiring

3.1 Choose a piece of 12 AWG wire and connect it to a cold-pressed terminal.

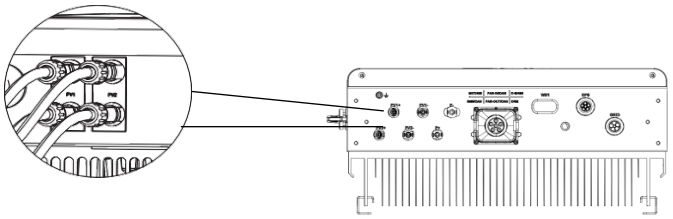
3.2 Remove 10mm of insulation sheath from the end of the wire.
3.3 Insert the stripped wire end into the pin contact, then clamp it tightly with a crimping tool.



Step 4. Insert the pin contact into the back of the male or female plug through a cable nut. When you feel or hear a "click" sound, it indicates that the pin contact module has been correctly locked.



Step 5. Insert the PV connector into the corresponding PV connector on an inverter.



6.4 Battery connection

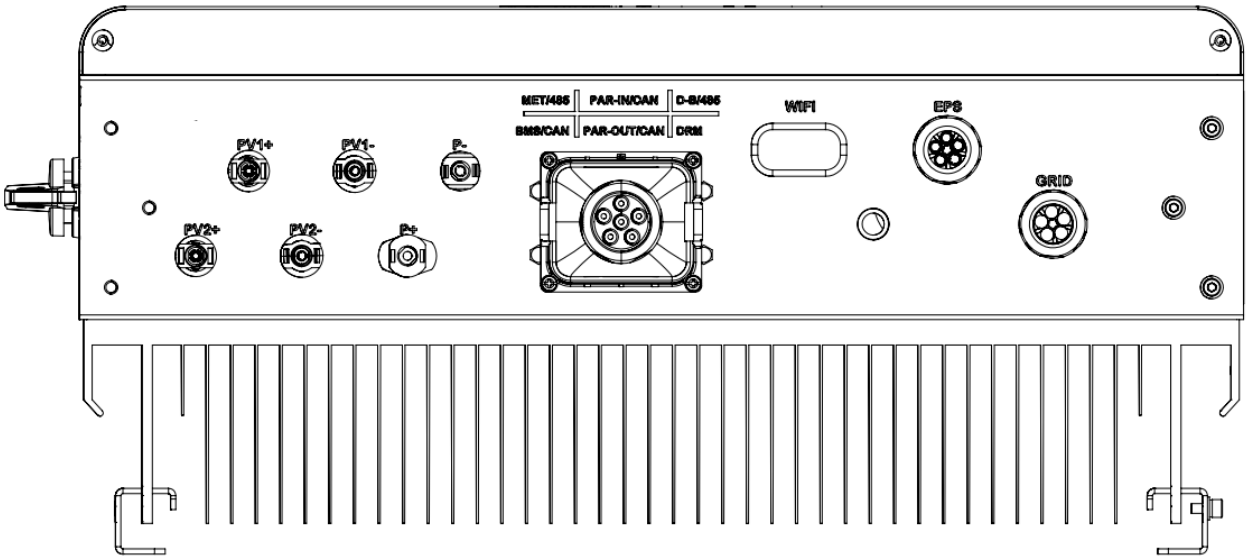
Danger

• Batteries used with the inverter should be approved by the inverter manufacturer, and a list of approved batteries can be obtained from the official website.
• Short circuit of the batteries may cause personal injuries, and the instantaneous high current caused by short circuit can release a large amount of energy, which may cause a fire.
• Before connecting the battery wires, please ensure that both the inverter and battery are powered off and that both upstream and downstream switches are disconnected.
• During the operation of the inverter, no connection or disconnection of the battery cable is allowed. Failing to operate according to the requirements may lead to electric shocks.
• Do not connect the same battery pack to multiple inverters, as this may cause damage to the inverters.
• Connecting loads between the inverter and batteries is not allowed.
• When connecting battery wires, please use insulated tools to prevent accidental electric shock or battery short-circuit.
• Make sure that the open circuit voltage of the batteries is kept within the allowable range of the inverter.
• A DC switch should be equipped between the inverter and the battery.

Warning

• When wiring, ensure the battery wires and the battery terminals "BAT+", "BAT-", and the ground port match perfectly. Incorrect cable connections will cause device damage.
• Make sure that the wire core is fully accessed into the terminal wiring hole and not exposed.
• Ensure cable connections are secure, as loose connections may cause the terminal to overheat and damage the

device during operation.
• Ensure the battery system used with the PCS has a pre-charging function, otherwise, it may cause PCS damage!

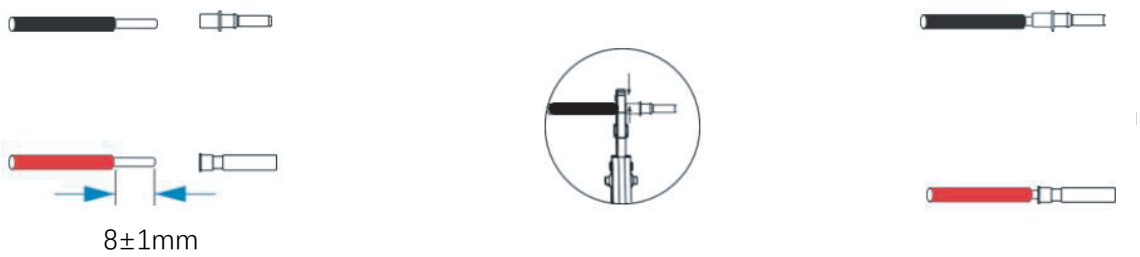


Note

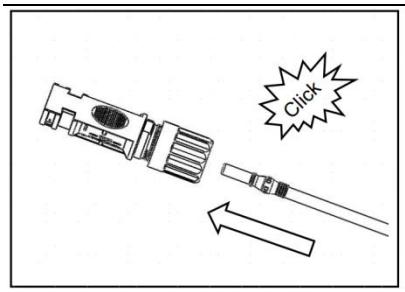
• Before selecting a battery pack, note that the maximum voltage of the battery pack should not exceed 875 V, the minimum voltage should not be less than 120 V, and the battery pack's communication protocol should be compatible with the hybrid inverter. It is important to note that using incompatible PCS and battery types (e.g., using a lead-acid battery for a lithium battery PCS) may lead to severe safety risks.
• Before connecting the battery pack to a split system, install a non-polarized DC circuit breaker (≥40A) to ensure safe disconnection of the inverter during maintenance.
• For split systems, create a connection cable between the battery pack and the inverter; the cable should be at least 10 AWG.
• The battery pack's communication will function properly only when the BMS is compatible with the inverter.
• When replacing the battery pack, turn off all switches and disconnect the system communication line.
• Do not reverse the connections of the battery positive and negative wires!
• All wiring and operations must be carried out with the power off, and must be completed by a qualified professional.

Wiring Instructions:

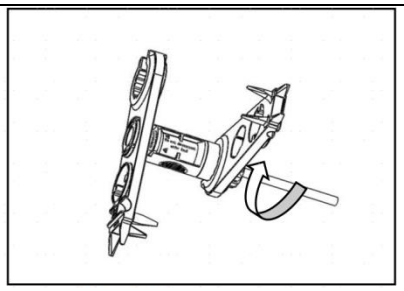
Step 1: Strip 8 mm of insulation from the end of a 10 AWG wire and crimp tightly with a crimping tool.



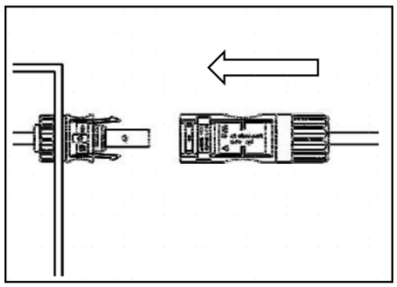
Step 2: Harness assembly and installation.



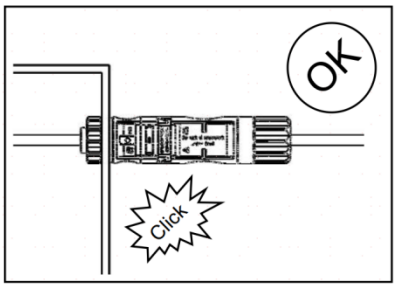
After crimping the stripped wire to the terminal, insert it into the negative connector of the wire end until you hear a "click".



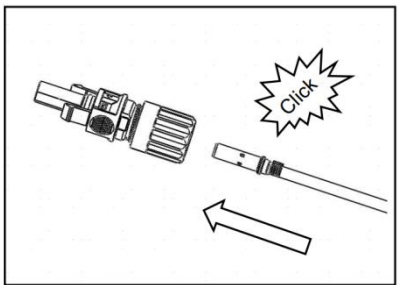
Tighten with a wrench clockwise to a torque of 2±0.1 N.m.



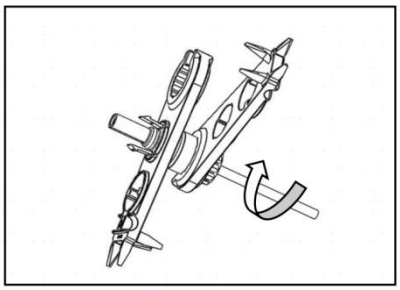
Insert the wire end negative into the board end negative.



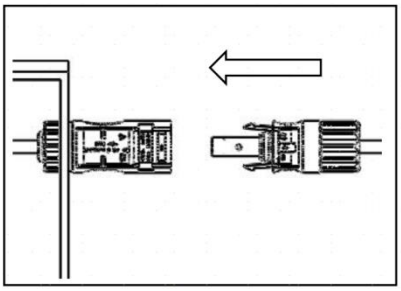
Upon hearing a "click," the installation is complete.



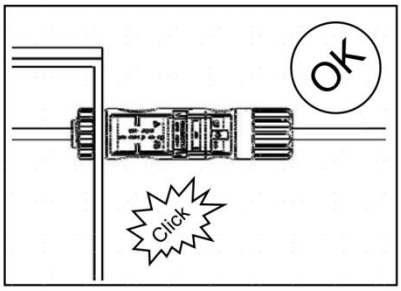
After crimping the stripped wire to the terminal, insert it into the negative connector of the wire end until you hear a "click".



Tighten with a wrench clockwise to a torque of 2±0.1 N.m.

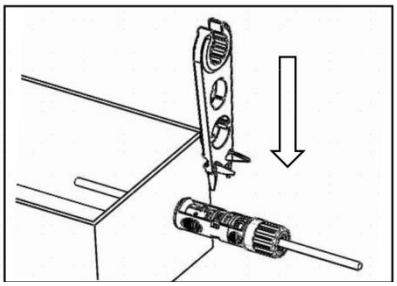


Insert the wire end positive into the board end positive.

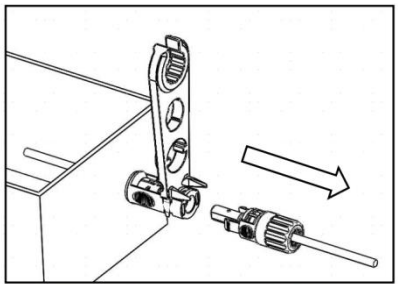


Upon hearing a "click," the installation is complete.

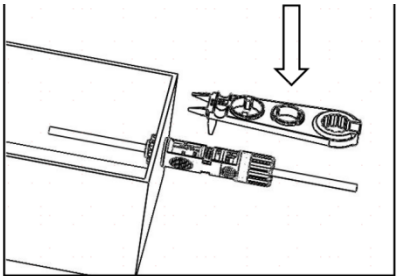
Unlocking Instructions (please use the special unlocking wrench as shown):



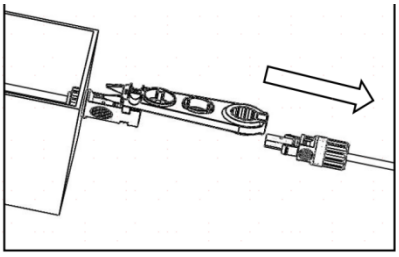
Insert the unlocking claw of the wrench into the gel core slot.



Push until the gel core slot separates and then pull out the gel core.



Insert the unlocking claw of the wrench into the gel core slot.



Push until the gel core slot separates and then pull out the gel core.

6.5 Communication connection

6.5.1 Definition of communication interface

➢ Definition of BMS PIN interface

The communication interface between the inverter and the battery pack is CAN, equipped with an RJ45 connector. The wiring sequence of modular plugs should meet the 568B standard: orange-white / orange / green-white / blue / blue-white / green / brown-white /brown.

1 8

	PIN	1	2	3	4	5	6	7	8
CAN	Definition	X	X	X	BMS_CANH	BMS_CANL	X	X	X

➢ DRM connection

DRM supports certain response modes by issuing the following control signals.

1 8

1	2	3	4	5	6	7	8
DRM0	DRM1	DRM2	DRM_COM	DRM_COM	DRM3	X	X

➢ METER PIN interface definition

The communication interface between the inverter and the Smart Meter is RS485, equipped with an RJ45 connector. The wiring sequence of modular plugs should meet the 568B standard: orange-white / orange / green-white / blue / blue-white / green / brown-white /brown.

1 8

	PIN	1	2	3	4	5	6	7	8
RS485	Definition	X	X	X	RS_485A	RS_485B	X	X	X

6.5.2 WiFi

Connection

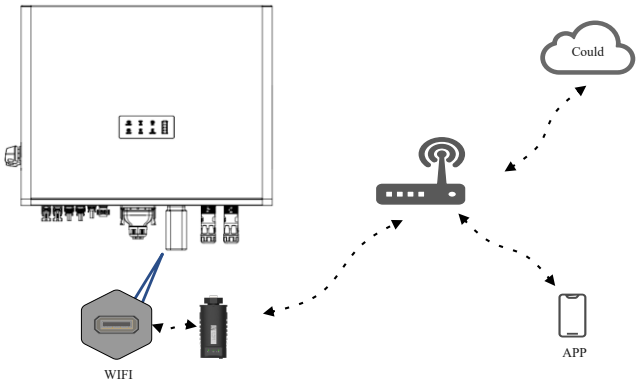
The inverters are provided with a WiFi port for collecting data from inverters and transmit it to a monitoring website through WiFi.

Step 1. Insert the WiFi plug into the "WIFI" port at the bottom of an inverter.

Step 2. Connect the inverter with a router.

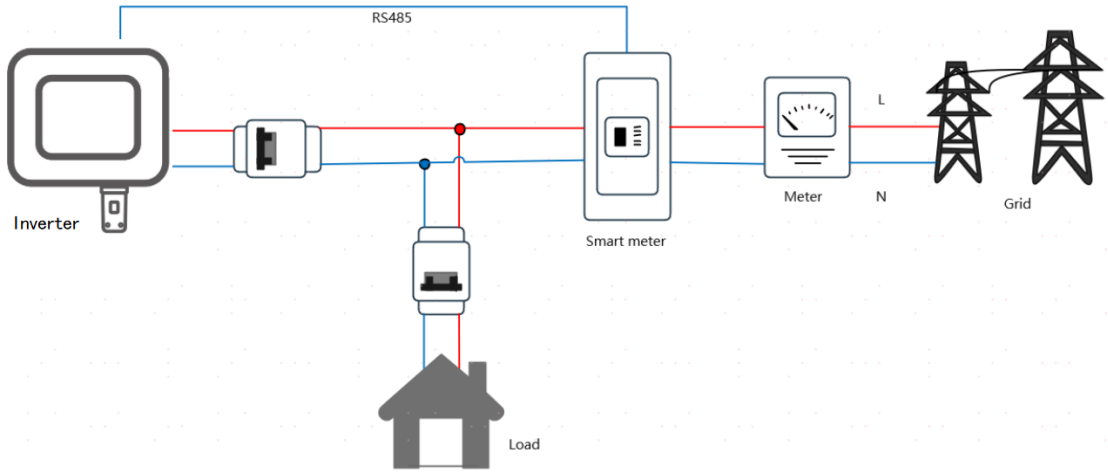
Step 3. Create a user account online. (See section 8.2 for WiFi configuration details).

➢ Schematic



6.5.3 Anti-reverse current networking scheme

The hybrid inverter can be paired with a smart meter to implement anti-reverse flow function.



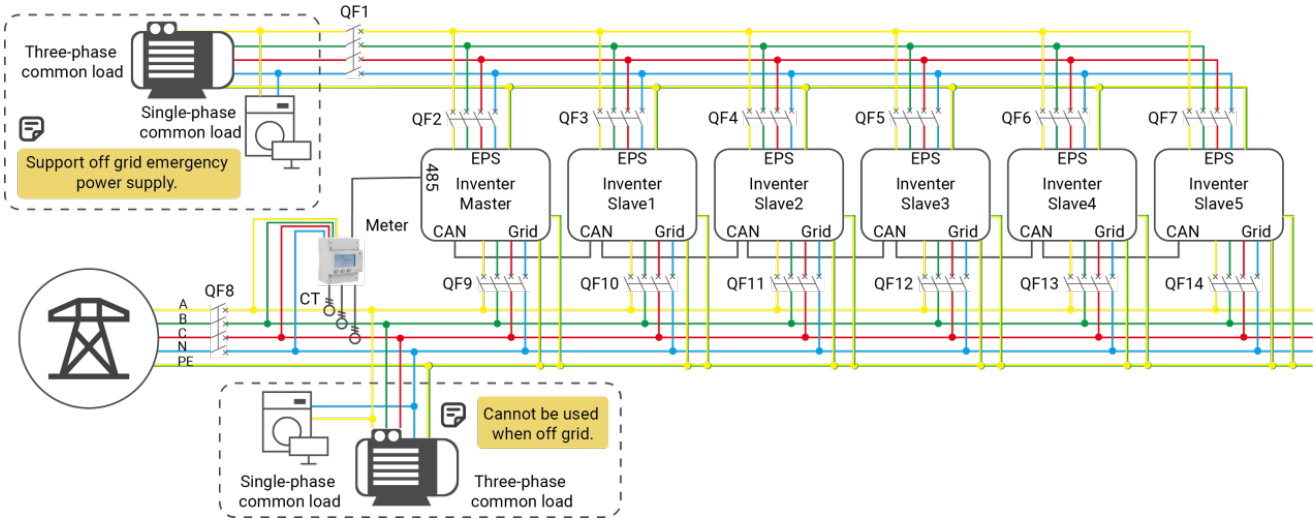
6.6 Parallel wiring scheme

This series of inverters has four power ranges: 5kW, 6kW, 8kW, and 10kW. Multiple inverter devices can be independently installed under the power grid, without interference or communication between inverters.

When EPS or GRID ports need to be used in parallel, no more than 6 inverters can be used to form a parallel system for capacity expansion. All parallel inverters must have the same software version.

6.6.1 Parallel wiring diagrams

When the system needs to use EPS or GRID port parallel function, the master-slave wiring must be carried out according to the following diagram. EPS port supports offline operation, while GRID port does not support offline operation.



Mark	Descriptions
QF1	EPS parallel circuit breaker, rated current ≥ 20A*N (number of inverters), rated voltage ≥ 400V.
QF2-7	EPS stand-alone circuit breaker, rated current= 20A, rated voltage ≥ 400V.
QF8	For entry circuit breakers, the current-carrying capacity shall take into account the total electrical current.
QF9-14	GRID stand-alone circuit breaker, rated current= 32A, rated voltage ≥ 400V.
METER	Direct meters are rated at 80A. Calculate the current value when the inverter is charging and there is a load on the GRID port. If it exceeds 80A, a mutual inductance meter should be used.
485	Inverter communication interface (MET/485)
CAN	Inverter communication interface (PAR-IN/CAN, PAR-OUT/CAN), with terminal resistors reserved at both ends.

6.6.2 Parallel power-up procedure

The inverter is divided into one master and several slaves, connected through CAN communication interfaces (PAR-IN/CAN, PAR-OUT/CAN).

Before powering on, confirm that the power line and parallel communication line have been connected according to the parallel wiring diagram, and that circuit breakers QF1-14 are all in the disconnected state.

The parallel power on sequence for EPS or GRID ports is as follows:

Step 1: Close the GRID side circuit breakers QF8-QF14 of the inverter.

Step 2: The device that communicates with the electricity meter is first powered on and automatically set as the host when there is no host.

Step 3: The remaining inverters are powered on sequentially, with the default setting being the slave in the master state.

Step 4: Close all EPS single circuit breakers QF2-QF7 of the inverters.

Step 5: Close the EPS parallel circuit breaker QF1 to supply power to the EPS load.

If you want to replace the host device, you need to power off all the slave devices, reset the host (automatically set as the host when there is no host after reset), and power on the slave devices in sequence;
If you want to add a slave device, you need to install a slave according to the wiring diagram, and power it on while the host is running; When the number of slave devices exceeds 5, newly added slave devices will report communication failures;
If you want to replace the slave device, you need to replace it according to the wiring diagram, and reset the host before powering on.

6.7 Installation Check

After the products are installed, make sure to check according to the following table!

Item	No.	Content
Installation	1	Check if the product installation is vertical and stable.
	2	Check all screws for being tightened (especially the electrical connection). Check the flat washers and spring washers for being complete and not placed upside down.
	3	Check if the distance reserved below the product meets the requirements.
	4	Check the accessories for being complete and the cables for being intact without damage.
Electrical connection	1	Check if the positive and negative cables on the PV side are correct.
	2	Check the knob switch at the PV side for being "OFF".
	3	Check if the connectors on the load side and the grid side are correctly placed.
	4	Check the casing grounding for being reliable.
	5	Check if all connectors are reliably connected.
	6	Check the cable models and specifications for being correct.
	7	Check if all cable connections are reliable.
	8	Check the colors of the AC cables for meeting the requirements and the safety signs for being complete.
	9	Check if the cables are neatly arranged and tied according to the technical specifications.

7. Test Operation of Device

7.1 Check before power on

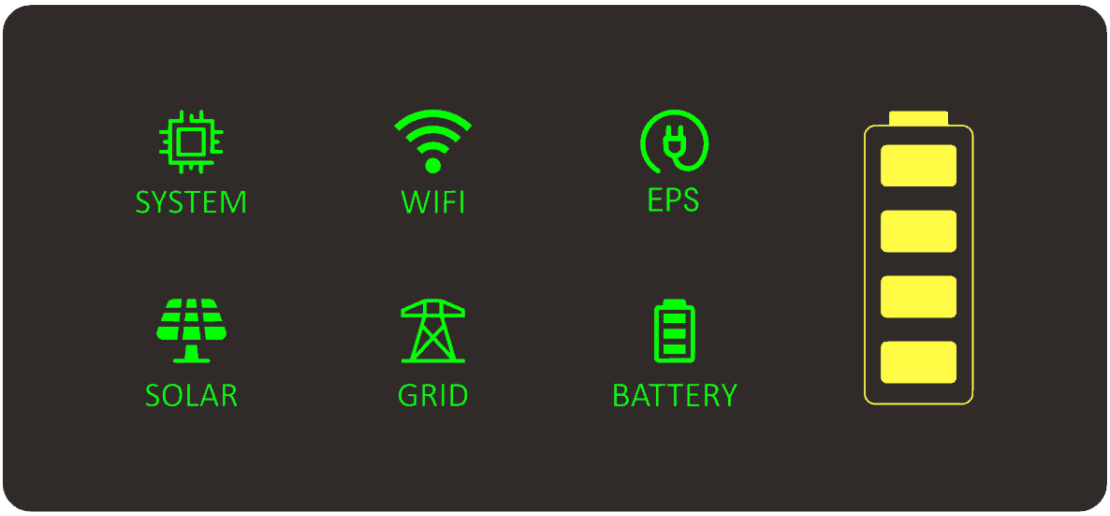
Number	Checklist
1	The inverter is firmly installed, conveniently located for operation and maintenance, the installation space facilitates ventilation and cooling, and the installation environment is clean and tidy.
2	The protective earth wire, DC input wire, AC output wire, and communication wire are correctly and firmly connected.
3	The cable ties meet the routing requirements, are reasonably distributed, and are undamaged.
4	Unused through holes are ensured to be fitted with waterproof covers.
5	Used through holes are ensured to be sealed.
6	The voltage and frequency at the inverter's grid connection point comply with grid connection requirements.

7.2 Device powering on

Step 1: Close the inverter's GRID AC circuit breaker.
Step 2: Close the inverter's EPS AC circuit breaker.
Step 3: Close the inverter's PV switch.
Step 4: Start battery supply.

8. LED Interface and Settings

8.1 Description of panel indicators



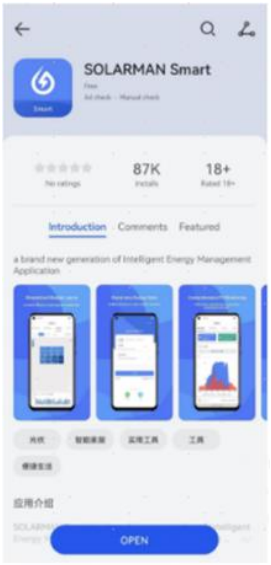
Name	Description
SYSTEM	(1) Off: The system is powered down. (2) Blue: initializing (3) Yellow: Standby. (4) Red: Fault (5) Green - Flashing: Starting. (6) Green: Running
WIFI	(1) Off: Without WiFi communication (2) Green: With WiFi communication
EPS	(1) Off: EPS port not powered (2) Yellow: EPS port powered (the device is not running, direct grid supply). (3) Red: Standby, abnormal AC input detected, EPS port voltage detected, Grid port voltage not detected (4) Green: EPS port powered (the device is running, supplying EPS, possibly from PV, battery, or grid).
SOLAR	(1) Off: No power at the PV port. (2) Yellow - flashing: PV port powered, however, too low voltage - below startup threshold (3) Yellow: The PV port is powered, but the PV module is not running. (4) Red: PV fault (PV side overvoltage, overcurrent, current leakage, etc.) detected (5) Green: The PV module is running.
GRID	(1) Off: No power at the Grid port. (2) Yellow - flashing: Grid port powered, normal voltage and frequency, however, reconnection to the grid according to regulations expected (currently not connected to the grid) (3) Yellow: The Grid port is powered, normal voltage/frequency. (4) Red: Grid port powered, abnormal voltage/frequency/phase sequence (5) Green: The Grid port is powered, and it is operating in grid-connected mode.
BATTERY	(1) Off: No power at the battery port.

	(2) Yellow - flashing: Bat port powered, however, too low voltage - below startup threshold (3) Yellow: The Bat port is powered, but the Bat module is not running. (4) Red: Bat fault (Bat side overvoltage, overcurrent, etc. (5) Green: The battery module is running.
Battery level	(1) Display battery level. (2) Flashing: Charging (3) Not flashing: Discharging/Idle state.

8.2 WiFi configuration

App download:

For the Android system, you can search for and download "SOLARMAN Smart" from the App market/store, while for the IOS system, you can download "SOLARMAN Smart" app from the App Store.



QR code download: The SOLARMAN Smart app can also be downloaded by scanning the QR codes on your phone. Scan the QR codes on your phone.

1) Open the APP, click Login to register a new user account;

2) Operate according to all instructions in the APP.

8.3 EMS configuration

The Energy Management System (EMS) can be configured through the App or online website.
Three operating modes can be set:
1. Self-consumption:
The APP will be used to manage your household electricity usage and reduce the cost of electricity from the grid.
2. Economic mode:
The battery level will be charged and discharged according to your settings.
3. Backup mode:
Unless there is a power outage, the battery will not discharge. In the event of a power outage, the battery can support household electricity use through discharge.

9. System Maintenance

9.1 Inverter power-off

Danger

• When operating or maintaining the inverter, please power it down. Operating the device while it is powered may cause damage to the inverter or pose a risk of electric shock.
• After the inverter is powered off, it takes a certain period of time for internal components to discharge. Wait until the device is fully discharged according to the label time requirements.

Step 1: Switch off the EPS AC circuit breaker of the inverter.
Step 2: Switch off the GRID AC circuit breaker of the inverter.
Step 3: Switch the inverter DC switch off.
Step 4: Switch off the energy storage circuit breaker between the inverter and batteries.

9.2 Inverter removal

Warning

• Ensure the inverter is powered down.
• When operating the inverters, wear personal protective equipment.

Step 1: Disconnect all electrical connections of an inverter, including DC cable, AC cable, communication cable, communication modules and protective grounding wire.
Step 2: Remove the inverter from the wall mount.
Step 3: Remove the wall-mounted bracket.
Step 4: Properly store the inverter. If it will be used in the future, be sure that the storage conditions meet the requirements.

9.3 Scrapping of inverters

When an inverter will go out of use and needs to be scrapped, dispose of it according to the electrical waste disposal requirements of the country/region where the inverter is located. DO NOT treat the inverter as household waste.

9.4 Fault handling

Inverter is easy to maintain. When encountering the following issues, see the following solutions. If the problems remain unresolved, contact your local dealer. When contacting the After-Sales Service Center, please collect the following information for a quick resolution.

1. Inverter information, such as serial number, software version, Indicator status information, device installation time, fault time and fault frequency, etc.
2. Device installation environment, such as weather conditions, covered modules and shadows, etc. It is recommended to provide photos, videos and other files to assist in analyzing the installation environment.
3. Grid conditions.

The following table shows some basic issues that may occur during actual operation as well as the corresponding basic solutions.

No.	Fault name	Reason	Solution
00	Relay detection failure	The relay may be damaged.	(1) Power off for 3 minutes and then restart with power on. (2) If the error warning persists, contact customer service.
01	Self-test failure	The inverter may be damaged.	(1) Power off for 3 minutes and then restart with power on. (2) If the error warning persists, contact customer service.
02	DC bus voltage too high	DC bus voltage exceeds maximum value.	(1) Power off for 3 minutes and then restart with power on.
03	AC side current sensor failure	AC side current sensor may be damaged.	(1) Power off for 3 minutes and then restart with power on. (2) If the error warning persists, contact customer service.
04	Residual current detection device failure	The residual current detection device may be damaged.	(1) Power off for 3 minutes and then restart with power on. (2) If the error warning persists, contact Customer Service.
05	Device failure	The inverter device may be damaged.	(1) Power off for 3 minutes and then restart with power on. (2) If the error warning persists, contact Customer Service.
06	Frequency change rate abnormality	The frequency change rate of the power grid exceeds the standard.	(1) Check the power grid for abnormalities.
07	AC side frequency out of range	Grid frequency is abnormal.	(1) Check whether the power grid is abnormal.
08	AC side voltage out of range	The grid voltage is abnormal.	(1) Check the grid for abnormalities.
09	Grid loss	Grid is abnormal.	(1) Check if the grid is abnormal.
10	Residual current detection failure	Residual current detection exceeds the standard.	(1) Check that the device is reliably grounded.
11	Overvoltage on PV	The voltage on the	(1) Check that the connected PV is within the range

	side	PV side is too high.	specified for the inverter.
12	Insulation impedance detection failure	Insulation impedance detection is abnormal.	(1) Check that the PE wire is connected to the inverter and grounded. (2) Power off for 3 minutes and then restart with power on. (3) If the error warning persists, contact customer service.
13	Inverter over-temperature	The inverter temperature is higher than the permissible value.	(1) Turn off the inverter and wait one hour before starting the inverter again.
14	Consistency fault: Inconsistent voltage sampling on AC side of main and sub CPUs	Inconsistent voltage sampling on AC side of main and sub CPUs.	(1) Power off for 3 minutes and then restart with power on. (2) If the error warning persists, contact customer service.
15	Consistency fault: Inconsistent sampling of frequency and voltage values on the AC side of the main and secondary CPUs	Inconsistent sampling of frequency and voltage values on the AC side of the main and secondary CPUs	(1) Power off for 3 minutes and then restart with power on. (2) If the error warning persists, contact customer service.
16	Ten-minute voltage average overvoltage	The ten-minute voltage average is abnormal.	(1) Check the power grid for abnormalities.
17	Residual current protection fault:30mA level	Residual current detection exceeds the standard.	(1) Check that the equipment is reliably grounded.
18	Residual current protection fault: 60mA level	Residual current detection exceeds the standard.	(1) Check that the device is securely earthed.
19	Residual current protection fault: 150mA level	Residual current test exceeds the standard.	(1) Check that the device is reliably earthed.
20	Internal Fan Failure Alarm	Internal fan failure.	(1) Power off for 3 minutes and then restart with power on. (2) If the error warning persists, contact customer service.
21	External Fan Fault Warning	External fan failure	(1) Power off for 3 minutes and then restart with power on. (2) If the error warning persists, contact Customer Service.
22	CPU Self-Test-Register Exception	Device CPU register failure	(1) If the error warning persists, contact Customer Service.
23	CPU self-test-RAM abnormality	Device CPU RAM fault	(1) If the error warning persists, contact Customer Service.

24	CPU self-test-ROM abnormality	Device CPU ROM failure	(1) If the error warning persists, contact customer service.
25	Low temperature warning	Battery temperature is below the permissible value.	(1) Check that the ambient temperature near the battery is as specified.
26	Battery SOC low	Battery SOC is lower than the set value.	(1) Battery capacity is low This is a normal warning (SOC<100%-DOD).
27	Battery malfunction	Alarm or malfunction in the battery system	(1) Check if the battery is alarming. (2) If the error warning persists, contact Customer Service.
28	Battery Communication Disconnect	Communication between the battery and the inverter is abnormal or not possible.	(1) Check that the battery is connected and that the communication cable is normal. (2) Check if the battery has failed.
29	EPS output overload	The EPS power is greater than the power specified by the equipment.	(1) Check that the load complies with the maximum power of the inverter. (2) If the error warning persists, contact Customer Service.
30	Combox disconnected from Cloud.	Combox is disconnected from Cloud.	(1) Check whether the network connection is normal.

9.5 Regular maintenance

⚠ Warning
• Ensure the inverter is powered down. • When operating the inverters, wear personal protective equipment.

Maintenance item	Maintenance method	Maintenance cycle
System cleaning	System cleaning - Check if there are foreign objects or dust on the heat sink.	Once every six months to once a year
DC switch	Turn the DC switch on and off 3 times continuously to ensure the DC switch functions normally.	Once / year
Electrical connection	Check for loose electrical connections, damaged cable appearance and copper exposure.	Once every six months to once a year
Sealability	Check if the device's inlet hole sealing meets the requirements; if there are large gaps or it is not sealed, re-seal it.	Once / year

Precautions

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In addition to the product warranty described alone, the state and local laws and regulations provide financial compensation for the product's power connection (including violation of implied terms and warranties). The company hereby declares that the terms and conditions of the product and the policy can and can only legally exclude all liability within a limited scope.

Under the guidance of our company, customers return our products so that our company can provide service of maintenance or replacement of products of the same value. Customers need to pay the necessary freight and other related costs. Any replacement or repair of the product will cover the remaining warranty period of the product. If any part of the product or product is replaced by the company itself during the warranty period, all rights and interests of the replacement product or component belong to the company.Factory warranty does not include damage due to the following reasons:
Damage during transportation of equipment;
Damage caused by incorrect installation or commissioning ;
Damage caused by failure to comply with operation instructions, installation instructions or
maintenance instructions :
Damage caused by attempts to modify, alter or repair products ,
Damage caused by incorrect use or operation ;
Damage caused by insufficient ventilation of equipment;
Damage caused by failure to comply with applicable safety standards or regulations;
Damage caused by natural disasters or force majeure (e.g. floods, lightning, over voltage, storms,fires, etc.)
In addition, normal wear or any other failure will not affect the basic operation of the product.Any external scratches, stains or natural mechanical wear does not represent a defect in the product.