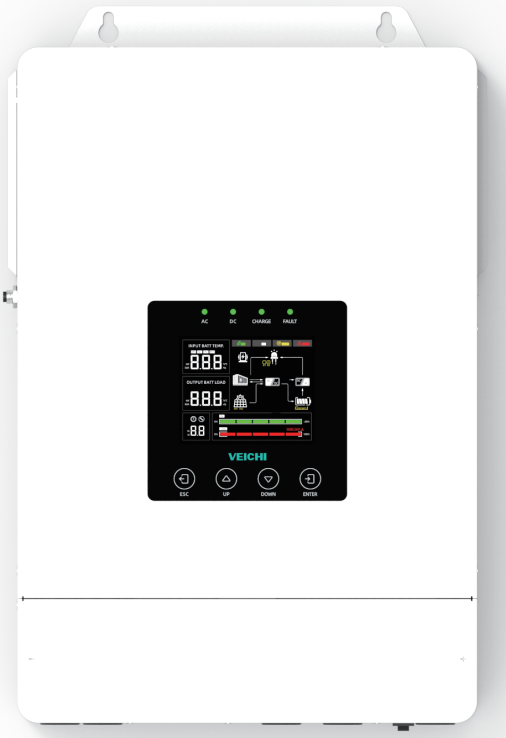
VEICHI

MPPT Solar Inverter

SV-(4-6)K-S



USER MANUAL

Catalog

1 General

This manual provides a comprehensive guide on the Single-phase off-grid inverter, covering product details, installation, wiring, configuration and debugging, as well as troubleshooting and maintenance. Before engaging with the product, kindly ensure to thoroughly review this manual to grasp the safety measures, capabilities, and distinctive features of the inverter. VEICHI is committed to the ongoing refinement of our products to surpass the expectations of our esteemed users, so it will maintain the prerogative to enhance the product continuously, with the corresponding manual content being updated in tandem to reflect the latest improvements. VEICHI possesses the ultimate authority to interpret the contents of this manual and reserves the right to make any necessary revisions. Should you encounter any uncertainties regarding the functions or performance of the inverter, our support team is always at your disposal for consultation and assistance.

1.1 Product

This document applies to the following inverter models:

Model	Rated Output Power	Rated Output Voltage
SV-(4-6)K-S	4000W/6000W	220V/230V/240V, L/N/PE

1.2 Operator

This product is intended for only professionals who are familiar with local codes and standards, electrical systems around this product.

1.3 Sign

Please review the symbols and their descriptions attentively, as these symbols are utilized to emphasize crucial information throughout the usage process.

⚠DANGER
High level of potential hazard that, if not avoided, could result in death or serious injury to persons.
⚠WARNING
Medium level of potential hazard that, if not avoided, could result in death or serious injury to persons.
⚠CAUTIOU
Low level of potential hazard that, if not avoided, could result in moderate or minor injury to persons.
ATTENTION
Emphasis and additions to the content may provide tips or tricks for optimal use of the product that can help the user solve a problem or save time.

2 Safety Precaution

The safety guidelines outlined in this manual must always be strictly adhered to when the equipment is in operation.

⚠ WARNING
The inverter has been designed and tested in accordance with strict safety regulations, while it is still very important to follow the relevant safety instructions before carrying out any operation on the equipment, as improper operation may result in serious injury or property damage.

2.1 General Safety

ATTENTION
Please read this document carefully to understand the product and precautions before installation. ● All equipment operations should be performed exclusively by certified electrical professionals who are well-versed in the local standards and safety regulations relevant to the project. ● Be sure to operate the inverter with insulated tools and personal protective gears. Wear anti-static gloves, wrist strap and clothes to avoid possible damage to the devices. ● VEICHI shall not be held liable for any damage to the equipment or personal injury resulting from the improper installation, use, or configuration of the inverter not in compliance with the instructions provided in this document.

2.2 PV String Safety

⚠ WARNING
● Be sure the module frame and bracket system are well grounded. ● Double check the DC cable connection after wiring. ● Use a multimeter to verify the continuity and correct polarity of the DC cable connections and if the voltage is within the allowable range. ● Do not connect the same PV string to more than one inverter, as this may cause equipment damage.

2.3 Inverter Safety

⚠ WARNING

- Be sure that the voltage and frequency at the grid-tied point meet the corresponding specifications.
- Better to add protection devices such as circuit breakers or fuses on the AC side of the inverter, both greater than 1.25 times the rated AC output current of the inverter.
- This inverter shall be connected to a permanently grounding system well. Always comply with local requirements and regulations when installing this inverter. And in the case of multiple inverters, ensure that all inverter housings are properly grounded.
- The BACK-UP function is not recommended for solar systems that are not configured with batteries. Electrical risks to the system resulting from this will be beyond the scope of the VEICHI's warranty.
- Please don't disassemble the inverter by yourself. If maintenance or repair is required, please resort to a specialized service center.
- Please disconnect all wires before performing any maintenance or cleaning to avoid electric shock. Turning off the device does not reduce the risk of electric shock.

⚠ DANGER

The labels and warning signs on the box must be clear after the inverter is installed, and obscuring, altering, or damaging them is prohibited.

The markings on the inverter case are as follows:

	High voltage: There is high voltage during operation, make sure that the inverter is disconnected from the power supply for certain operations.		Discharge delay: After powering down the unit, wait at least 5 minutes until the unit is fully discharged.
	Manual review: Please read the product manual in detail before operating the equipment.		Danger: The equipment is potentially hazardous during operation. Exercise all necessary precautions to mitigate any risks.
	High temperatures: Do not touch it while the unit is in operation as this may result in scalds.		Proper disposal: The equipment should not be disposed of as household garbage. Please follow local laws and regulations or send it back to the manufacturer.
	CE mark		Grounding point

2.4 Battery Safety

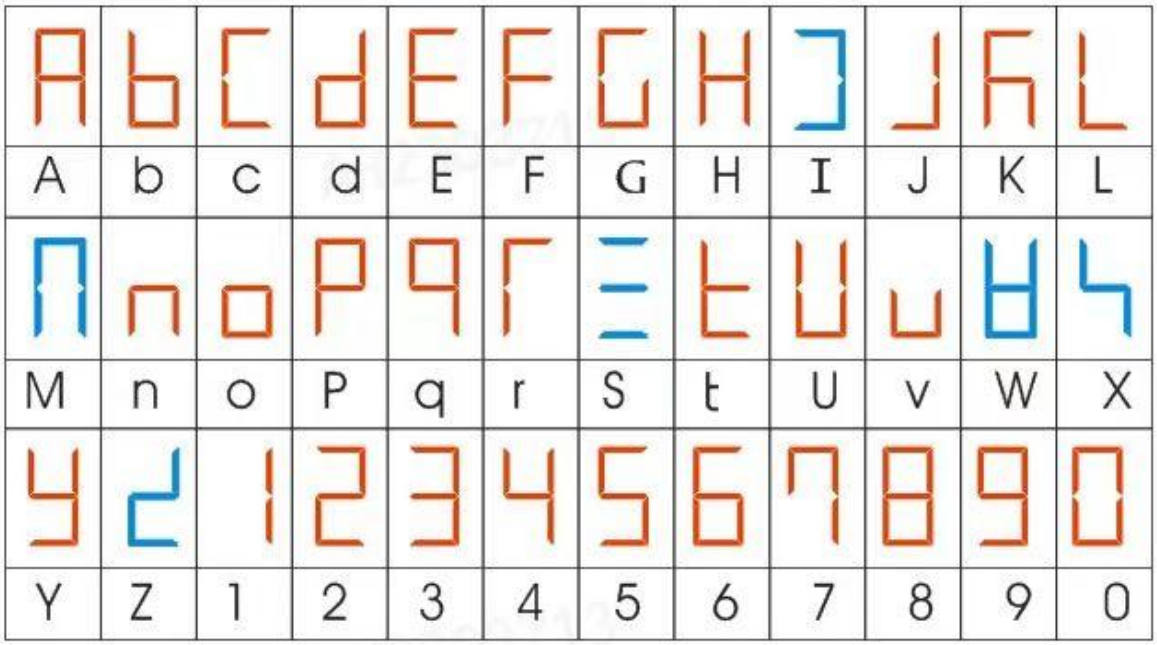
⚠ DANGER
When working with or around batteries, handle metal tools with the utmost care. The inadvertent dropping of these tools can lead to sparks or short-circuits, potentially causing explosions and extensive damage to the battery or other electrical components. Be aware that any damage therefrom is not covered by VEICHI's warranty.
⚠ WARNING
● Batteries used with the inverter shall be approved by VEICHI, and a list of approved batteries is available through the official website. ● Read the battery manual to understand the product and precautions before installing the equipment, and operate strictly according to the requirements within. ● If the battery is completely drained, recharge it following the guidelines specific to its model. ● Battery performance can be affected by several factors, such as: temperature, humidity, weather conditions, etc., which may result in current limitation and load capacity fluctuation. ● Should the battery fail to function, promptly reach out to the after-sales service center for assistance, to avoid further damage. ● Use a multimeter to verify the DC cable connections at both the positive and negative ends, and that the voltage is within the allowable range. ● Do not connect the same PV string to more than one MPPT, as this may cause equipment damage.

2.5 Personnel Requirements

ATTENTION
During operation, certain components of the inverter may carry electrical current or generate heat. But there are inherent risks even though it's not working. Improper use, installation or operation can result in serious injury to persons or property. ● Therefore, only individuals who are qualified and have undergone rigorous training should be entrusted with the responsibility of installing and maintaining the equipment. They must be well-versed in various safety precautions and the correct operational methods to ensure safe and effective use. ● Installation, maintenance, and replacement of equipment or parts must be performed by professionals or qualified personnel.

2.6CRT Alphabetical Changes

SV-(4-6)K-S uses CRTs for human-computer interaction, but different CRTs have inconsistent descriptions of the numbers. Below are the alphabetic versions used by the inverters.



3 Inspection and Preservation

3.1 Inspection before Acceptance

Please check the following items carefully before acceptance, and contact the local dealer at once if there are any abnormalities and try to keep the package as intact as possible.

1. Check the outer package for damage, such as deformation, openings, cracks or other signs that may cause damage to the equipment inside the box.
2. Check if the inverter model is what you have ordered.
3. Check deliverables for correct type, quantity, and appearance damage.

3.2 Deliverables

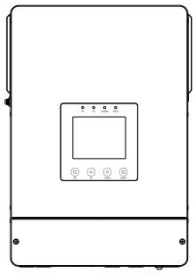
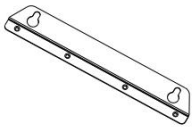
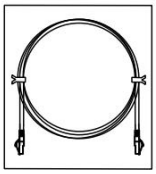
 Hybrid Inverter x1	 Support Bracket x1	 SC35-8 x2	 RNB5-4 x1
 Manual x1	 Rj45 cable x1	 Screw M3*6 x4	

Table3-1 Deliverables

3.3 Product Preservation

If the inverter is not to be put into service immediately, please keep it according to the following requirements:

1. Keep the original packaging intact.
2. Ensure a clean environment with proper temperature and humidity and no condensation.
3. Follow the box label for stacking height and direction.
4. Prevent any risk of dumping after stacking.
5. Have a professional inspect the inverter after long-term storage.

4 Product Introduction

4.1 Brief

The SV-(5-6)K-S inverter is a multifunctional single-phase hybrid inverter designed for PV systems, offering precise control and optimization of energy flow through an integrated energy management system. This system ensures that the power generated by the PV system is efficiently allocated to meet loads, stored in batteries for later use.

Its main advantages include:

- Versatility: Combined functions of inverter, solar charger and battery charger facilitate flexible management and use of energy.
- Energy management: An integrated energy management system allows control and optimization of the energy flow for efficient use of energy.
- Portability: Portable UPS are available for situations where a mobile or temporary power solution is required.
- Battery and solar charging: The capability to perform both battery and solar charging adds to the system's flexibility in storing and utilizing energy.

4.2 Function Characteristics

The SV-(5-6)K-S inverter offers a suite of advanced features as follows:

- On-grid capability: It can export excess solar power to the grid, providing an opportunity for users to sell or feed back surplus energy.
- Power supply priority: Users can prioritize between battery and grid power to optimize energy consumption according to their needs.
- Multiple work modes:
  - UPS mode: It automatically switches to battery power during grid failures to ensure continuous operation of critical equipment.
- Battery charging current/voltage setting: Users can customize the charging parameters to suit different types and states of batteries.
- AC/Solar/Generator charger priority: Users can set the priority of different energy inputs to optimize energy flow.
- Mains voltage or generator power compatibility: The inverter can adapt to different power inputs for flexible of use.
- Overload/overheat/short-circuit protection: The inverter is equipped with protection mechanisms to safeguard against equipment damage and safety hazards.
- Intelligent charging: Built-in intelligent charger can adjust the charging strategy according to the state of the battery to prolong its service life.
- MPPT 2-stage charging: It optimizes the battery charging process through two-stage charging strategy to improve efficiency and battery life.

- Intelligent load: The inverter can dynamically adjust the output based on load demands to ensure efficient energy distribution.

4.3 Application

Household energy storage single-phase hybrid inverters are mainly used in places with high or changing electricity prices, areas without grids at all or places requiring uninterrupted power supply and emergency power supply. Please check the following items for applications in different scenarios:

⚠ WARNING
● Do not use this product for equipment that needs stable power supply such as life-sustaining medical equipment. ● Do not use the BACK-UP function for PV systems that are not configured with batteries. Any electrical risks arising from this misuse are not covered by VEICHI's warranty. ● Battery current may be affected by several factors, such as: temperature, humidity, weather conditions, etc., which may result in current limitation and load capacity fluctuation. ● The inverter can be restarted automatically when overload protection occurs for a single time; But repeated overloads may extend the restart time. For quicker restarts in such cases, use the inverter's APP. ● If the off-grid load exceeds the inverter's rated power during a grid outage, the off-grid function will shut down automatically. To reactivate it, reduce the load to below the inverter's rated power. ● The BACK-UP output port of the inverter is equipped with overload characteristic and UPS function (switching time <10ms), suitable for typical household loads during power grid failures. For stable UPS switching and power supply to connected loads, minimize the use of high-start-current devices, such as powerful pumps. ● Inductive load: Maximum support for one set of 1.5P fixed-frequency air conditioners. Access to two or more may lead to the standby mode failure. ● Capacitive load: The total power of capacitive loads should not exceed 66% of the inverter's rated output power.

4.4 Technical Data

Table 4-1 Technical Data

Technical Data	SV-4K-S	SV-6K-S
Solar Input Data		
Max. PV Input Power	4400W	7800W
Max. Input Voltage	500V	550V
Start-up Voltage	120V	
MPPT Voltage Range	90V~450V	90V~500V
Max. Input Current per MPPT	18A	27A
Max. Short Circuit Current per MPPT	23A	32A
Number of MPPT	1	1
AC Input Data(Grid&Generator)		
Nominal Input Voltage	230Vac，L/N/PE	
Input Voltage Range	90~280Vac	
Max. Input Current	35A	
Nominal Input Power	8050W	
AC Frequency Range	50/60Hz(Auto sensing)	
Battery Data		
Battery Type	Li-Ion/Lead-acid	
Nominal Battery Voltage	24V	48V
Battery Voltage Range	21~30V	42~60V
Max. Discharge Current	137A	
Max. Charge/Discharge Power	3300	6000
Li-Ion Battery Activation	Yes	
Li-Ion Battery Communication	CAN/RS485	
Max. Charge Current (PV+AC)	120A	120A
Inverter Output Data		
Nominal Output Power	4000W	6000W
Peak Apparent AC Power	8000VA	12000VA
Nominal AC Voltage	230V	
Nominal Grid Frequency	50/60Hz	
Voltage Waveform	Pure Sine wave	
Transfer Time	10ms	
Max. Output Current	18A	27A
Overload Protection	30s@102%-110% load；5s@130%-200% load	
THDv (@linear load)	<3%	

Technical Data	SV-4K-S	SV-6K-S
Efficiency		
Peak Efficiency	94%	
MPPT Efficiency	≥99.9%	
Protection		
DC Surge Protection	Yes	
AC Surge Protection	Yes	
AC Short circuit Protection	Yes	
System Parameters		
Dimension (W*H*D)	333*505*120mm	
Weight	10.6kg	
Relative Humidity	5%~95% (Non-condensing)	
Operating Temperature Range	-10℃~50℃	
Noise Emission	≤50dB	
Altitude	4000m	
Cooling Method	Fan Cooling	
Ingress Protection	IP21	
Characteristic		
Number of AC Output	2	
Display	LCD&APP	
Communication Interface	RS485/ USB /CAN/ Wi-Fi	
Parallel Capability	No	9

4.5 Appearance

4.5.1 Port Introduction

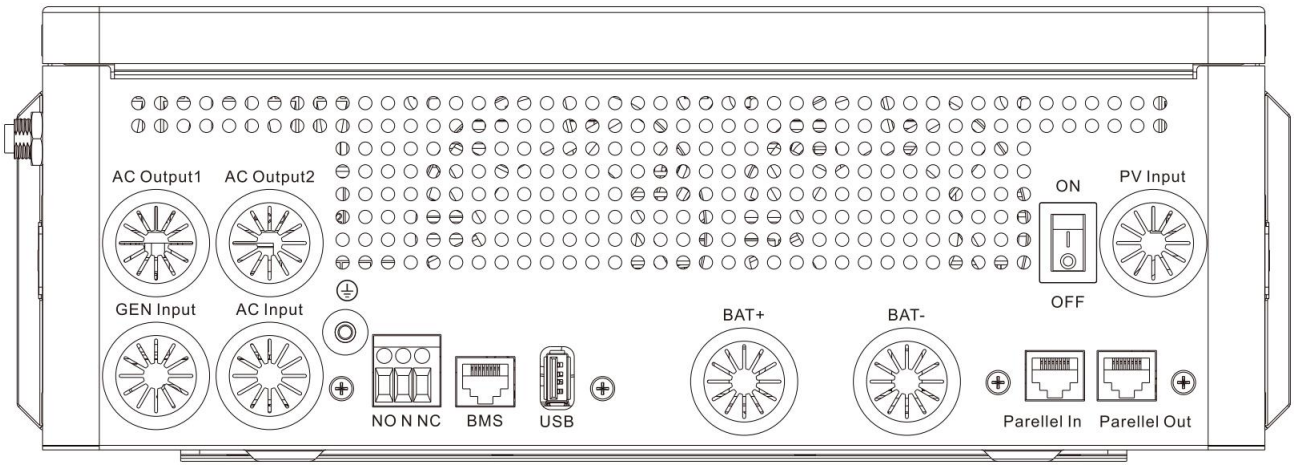


Figure 4-4 Port Introduction

Table 4-2 Port Description

Description	Description
PV input switch	Explosion-proof device
PV input (PV1+/-, PV2+/-)	BMS communication (BMS)
Meter communication (METER)	Battery input (BATTERY+/-)
Communication module	Multi-function communication
GEN input	Load AC output
Antenna	GRID AC output

4.6.2 Product Dimension

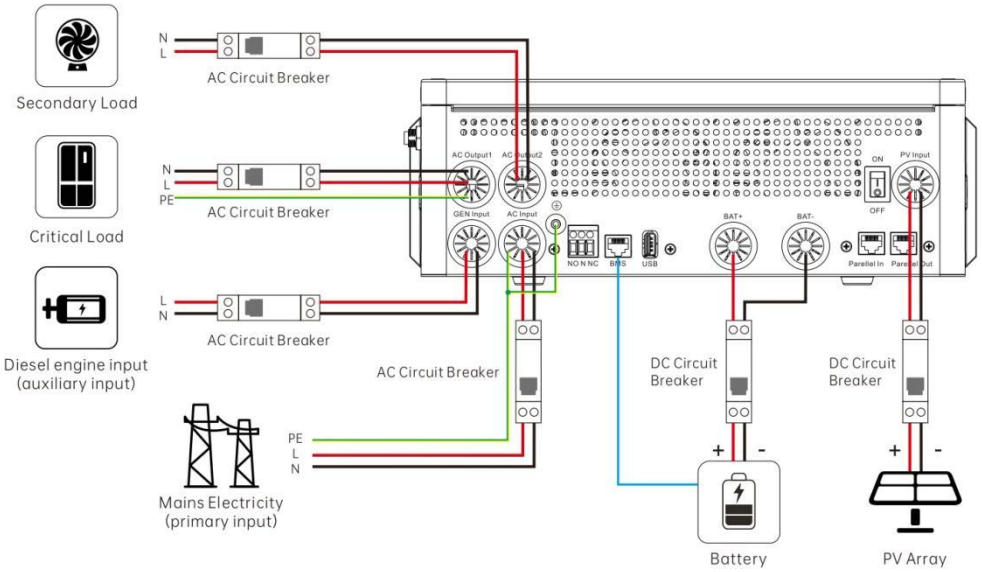
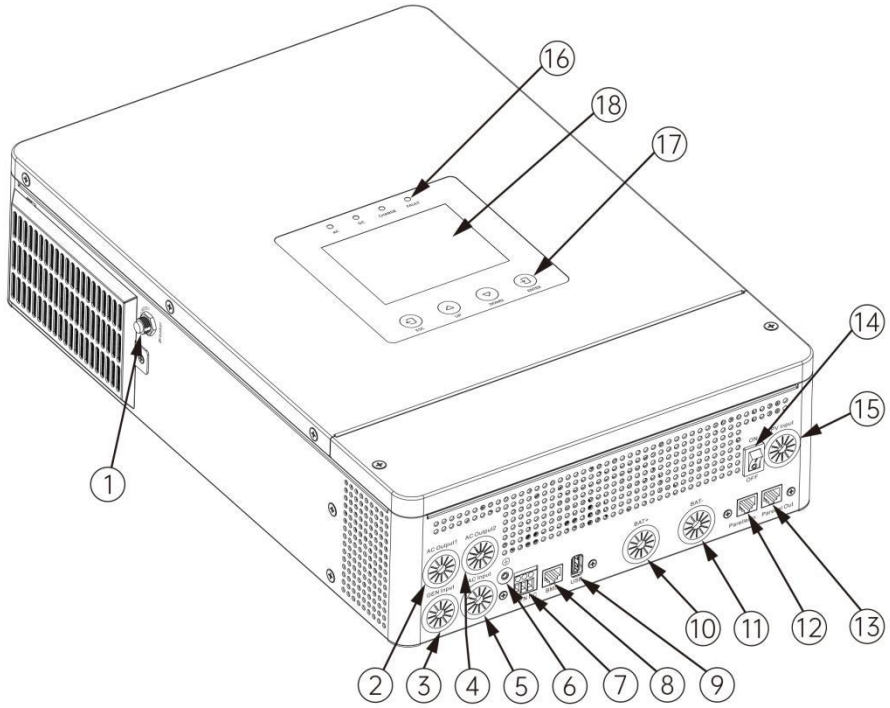


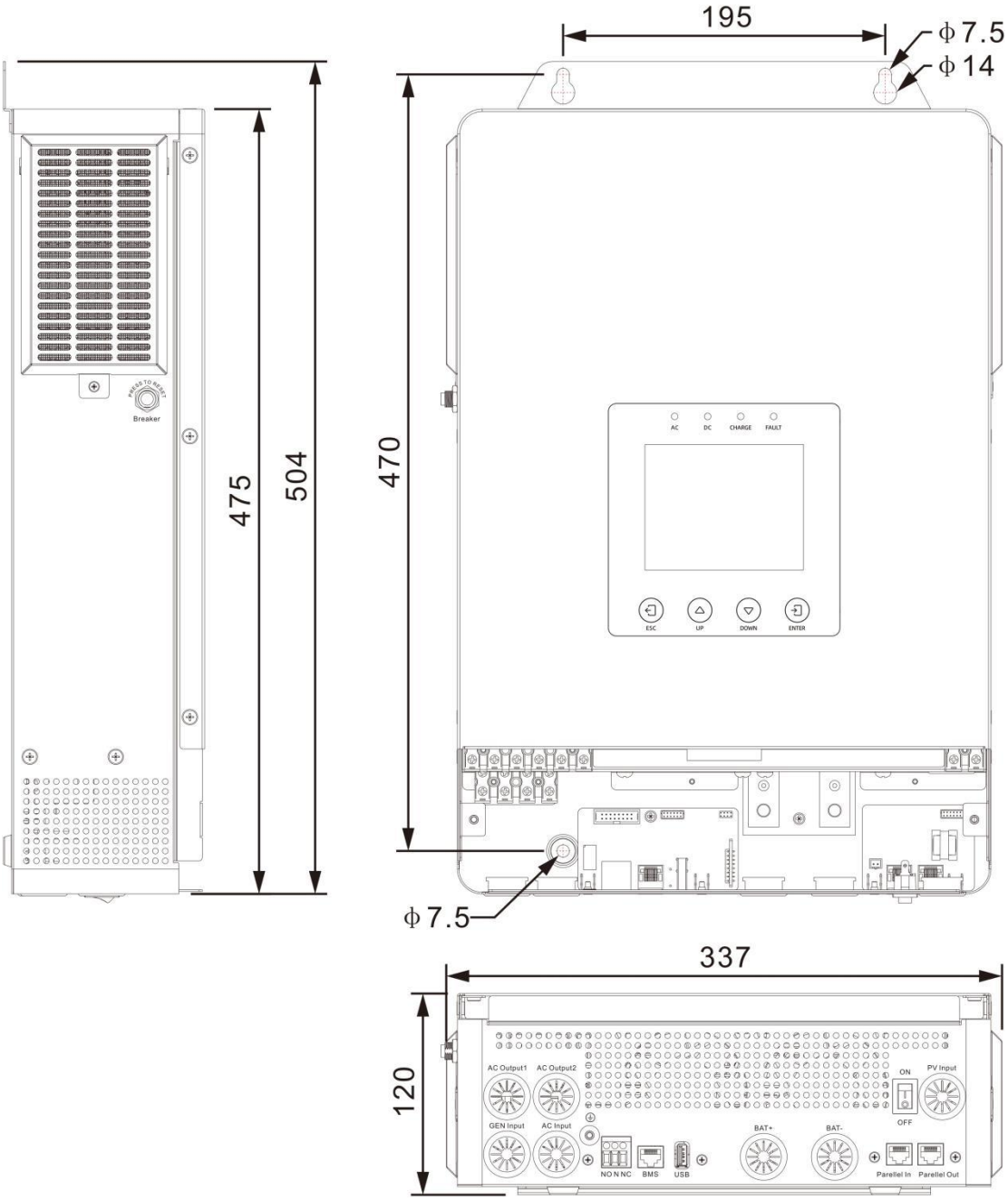
Figure 4-5 System Wiring Diagram

4.7Product Appearance



1	Overload protector for AC input	10	Input port for battery anode
2	AC output port 1	11	Input port for battery cathode
3	Input port for diesel generator	12	Parallel communication port (output)
4	AC output port 2	13	Parallel communication port (input)
5	AC input port	14	ON/OFF rocker switch
6	Ground screw hole	15	PV input port
7	Dry contact port	16	LED light
8	BMS communication port	17	Key
9	USB communication port	18	LCD screen

4.8 Dimensional Drawing



5 Installation

5.1 Installation Requirements

5.1.1 Environmental Requirements

1. Do not install it in flammable, explosive, or corrosive places.
2. Maintain a safe distance away from people, children especially. Refrain from touching the surface during operation to avoid scalds.
3. Refrain from drilling to the water pipes, cables, etc. in the wall around the inverter.
4. Protect it away from sun, rain, snow and such. Use a shelter or awning if necessary
5. Reserve adequate space for ventilation, dissipation and operation.
6. Keep indoor and outdoor temperature and humidity within the specified range.
7. The height of the equipment shall be convenient for operation and maintenance, viewing of indicator lights and labels, and wiring operations.
8. Do not install the inverter at altitudes higher than 3000 meters.
9. Keep it away from strong magnetic field environment to avoid electromagnetic interference. If there is a radio station or wireless communication equipment below 30MHz nearby, install the equipment in the following way:
   a) Add ferrite cores with multi-turn windings or low-pass EMI filters to the DC input or AC output lines of the inverter.
   b) Keep the inverter at least 30 meters away from such equipment.

5.1.2 Base Requirements

1. It is not be flammable and fire resistant.
2. It is firm and solid for the inverter’s weight.
3. It is sound-proof to minimizes noise disturbance to nearby residents

5.1.3 Angle Requirements

1. Install the inverter vertically or with a maximum tilt back of 15°.
2. Do not install it upside down, tilted forward, excessively backward, or lying flat.

5.2 Wiring Specifications and Circuit Breaker Selection

The wiring and installation must comply with requirements of the national and local electrical codes. The wiring specifications and circuit breakers are recommended as follows:

- Specifications of the AC input and output wire diameter and circuit breaker are as follows:

Device Model	Recommended wire size of AC input/output	Maximum working current	Recommended model of the air switch or circuit breaker
SV-4K-S	10mm²/7AWG	35A	2P-63A
SV-6K-S	10mm²/7AWG	35A	2P-63A

- Specifications of the PV input wire diameter and circuit breaker are as follows:

Device Model	Recommended wire size of PV input	Maximum working current	Recommended model of the air switch or circuit breaker
SV-4K-S	5~8mm²/8~10AWG	18A	2P-30A
SV-6K-S	5~8mm²/8~10AWG	27A	2P-30A

- Specifications of the battery input wire diameter and circuit breaker are as follows:

Device Model	Recommended wire size of BAT input	Recommended O-type terminal	Maximum working current	Recommended model of the air switch or circuit breaker
SV-4K-S	30mm²/1AWG	2P-180A	137A	2P-180A
SV-6K-S	30mm²/1AWG	S35-6	137A	2P-180A

- Specification of the shell earth wire is as follows:

Device Model	Recommended size of the earth wire
SV-(3-4)K-S	4-6mm²/10-12AWG
SV-(5-6)K-S	4-6mm²/10-12AWG

Notes:

- The wire diameters are for reference only. If the distance between the PV array and the device or between the device and the battery is long, the thicker wire can reduce the voltage drop to improve the system efficiency.
- The above wire diameters and circuit breakers are theoretically recommended. Please select the appropriate wire diameters and circuit breakers based on actual conditions.

5.3 Installation and Wiring

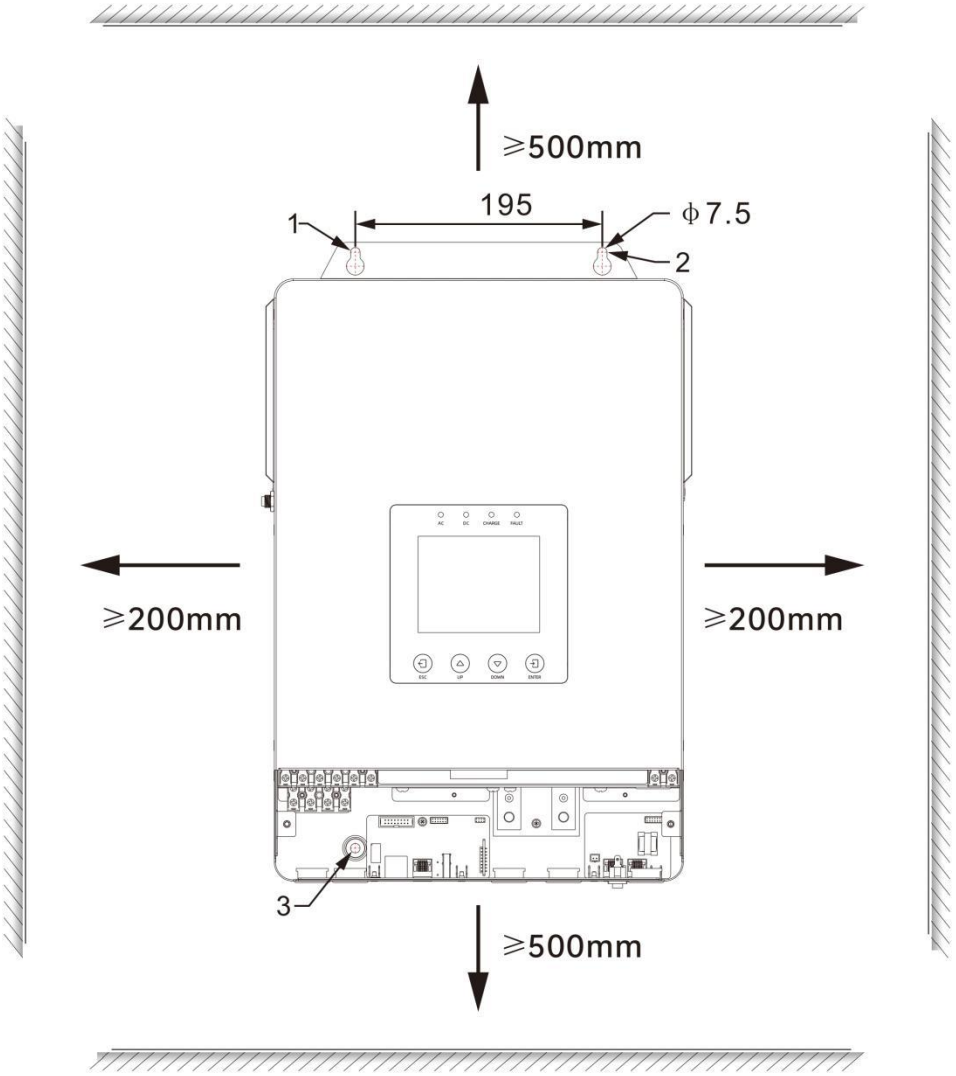
Warnings:

- There is unsafe voltage in the grid input and PV input. Please disconnect the circuit breaker or air switch before wiring.
- During the wiring process, please make sure the circuit breaker and air switch are disconnected in case of short circuit and the “+” and “-” polarities on each port are correctly connected. The circuit breaker must be installed on the battery port.

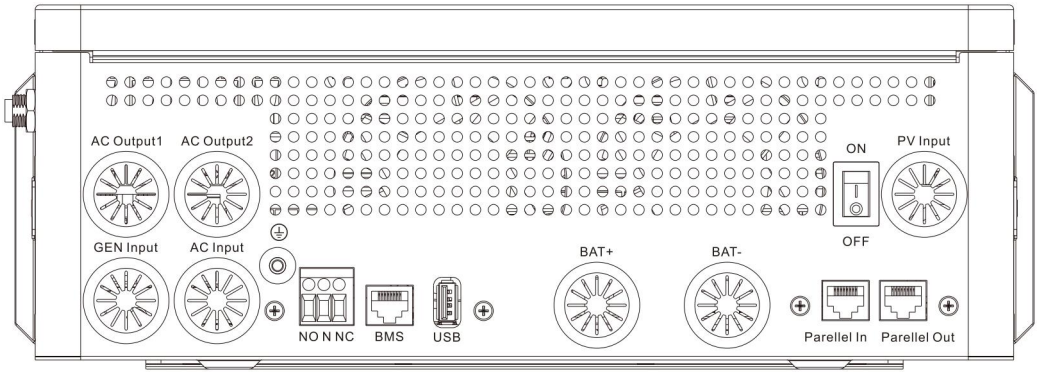
Installation and wiring steps are as follows:

Step 1:

Reserve a gap of 500 mm above and below the inverter and a gap of 200 mm on the left and right on an appropriate wall to ensure ventilation and heat dissipation. Unpack and take out the inverter, disassemble the terminal cover by removing the screws, and fix the inverter on the wall with three screws. As shown in the figure below, fix the device through holes 1 and 2 with M6*80 expansion bolts, and through hole 3 with M4 or M5 screws.



Step 2: Wiring



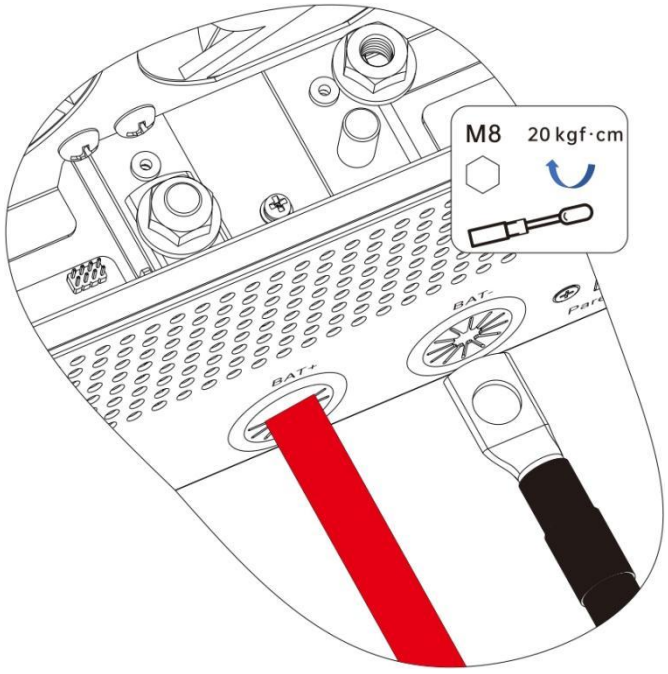
Bottom view

Please follow the steps below to perform the wiring. In order to ensure safe operation and comply with regulations, please install a circuit breaker and disconnect the circuit breaker before wiring.

(1) Connect the battery

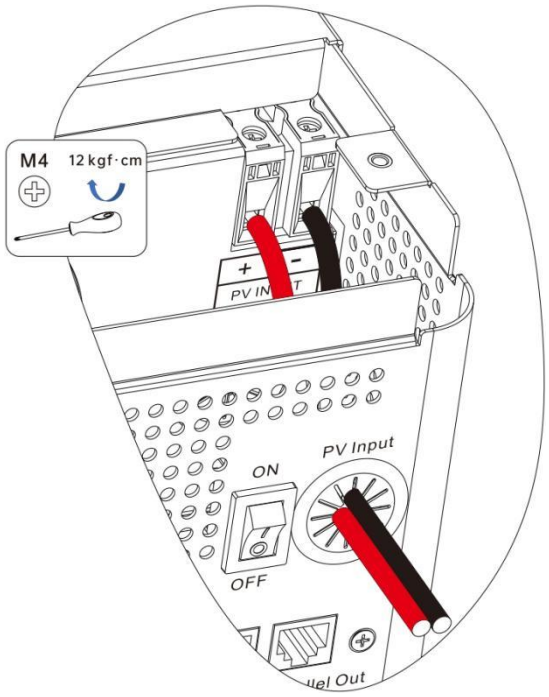
Before wiring, disconnect the external circuit breaker and check whether the cables used are thick enough. Please refer to “2.2 Wiring Specifications and Circuit Breaker Selection.” The BAT cables must be connected to the device with an O-type terminal with a recommended internal diameter of 8mm. The O-type terminal must clamp the BAT cables tightly to prevent excessive heat caused by excessive contact impedance;

Insert BAT+/BAT- cables as indicated on the label, and fix them with the M8 flange nut. The torque is 20 kgf.cm. As shown in the figure below, “BAT+” represents the battery anode, and “BAT-” the battery cathode.



(2) Connect PV cables

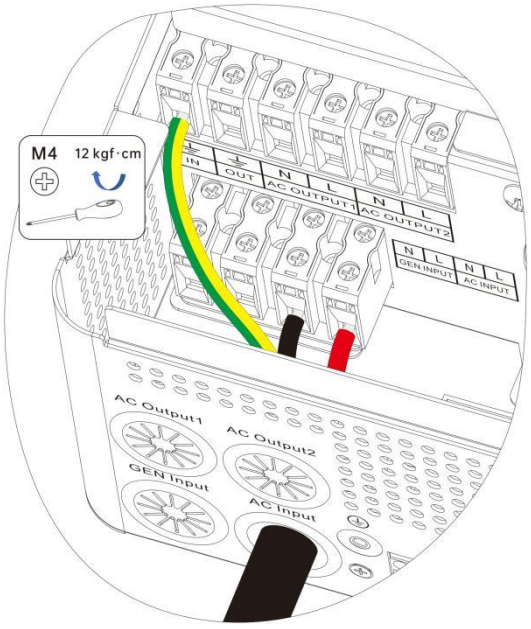
Before wiring, please disconnect the external circuit breaker and check whether the cables used are thick enough. Please refer to “2.2 Wiring Specifications and Circuit Breaker Selection.” Insert PV+/PV- cables as indicated on the label, and fix the terminals on the device with a slotted screwdriver. The torque is 12 kgf.cm. As shown in the figure below, “PV+” represents the positive PV input, and “PV-” the negative PV input.



(3) Connect AC input

Before AC input wiring, please disconnect the external circuit breaker and check whether the cables used are thick enough. Please refer to “2.2 Wiring Specifications and Circuit Breaker Selection.”

Insert AC output cables as indicated on the label, and fix the terminals on the device with a slotted screwdriver. The torque is 12 kgf.cm. As shown in the figure below, “L” represents the live wire, “N” the neutral wire, and “PE” the protective earth wire.

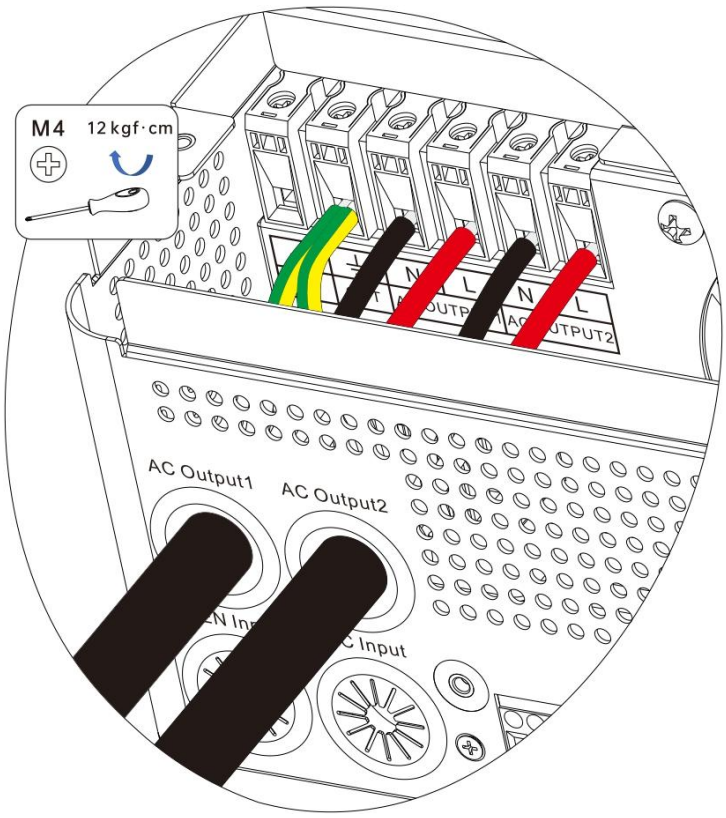


(4) Connect AC output

The inverter has duplex output ports with “Output 1” being the primary load output port and “Output 2” the secondary load output port.

Before AC output wiring, please disconnect the external circuit breaker and check whether the cables used are thick enough. Please refer to “2.2 Wiring Specifications and Circuit Breaker Selection.”

Insert AC output cables as indicated on the label, and fix the terminals on the device with a slotted screwdriver. The torque is 12 kgf.cm. As shown in the figure below, “L” represents the live wire, “N” the neutral wire, and “PE” the protective earth wire. Please note that the two outputs share the same earth wire port.

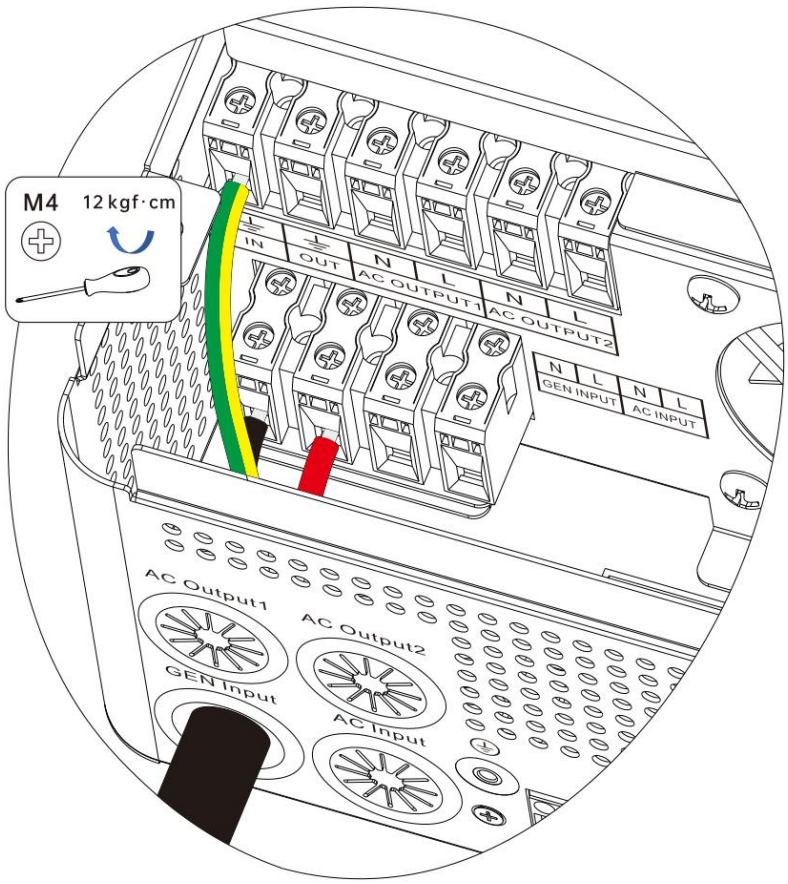


(5) AC input of diesel generator

This port is designed only for the models with the diesel generator input function.

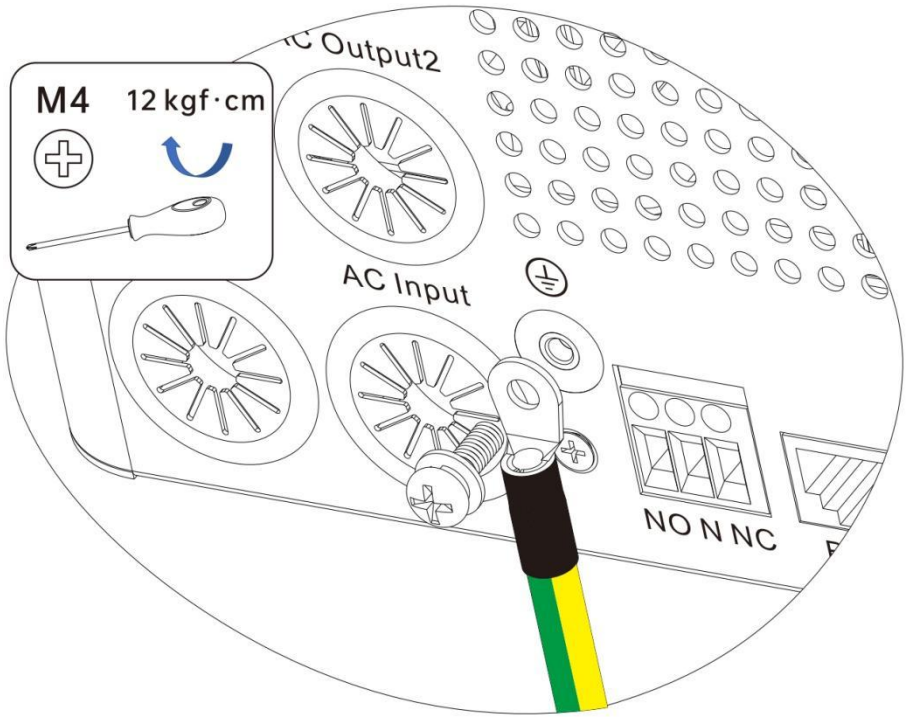
Before wiring inputs, please disconnect the external circuit breaker and check whether the cables used are thick enough. Please refer to “2.2 Wiring Specifications and Circuit Breaker Selection.”

Insert AC output cables as indicated on the label, and fix the terminals on the device with a slotted screwdriver. The torque is 12 kgf.cm. As shown in the figure below, “L” represents the live wire, “N” the neutral wire, and “PE” the protective earth wire. Please note that the diesel generator input and grid AC input share the same earth wire port.



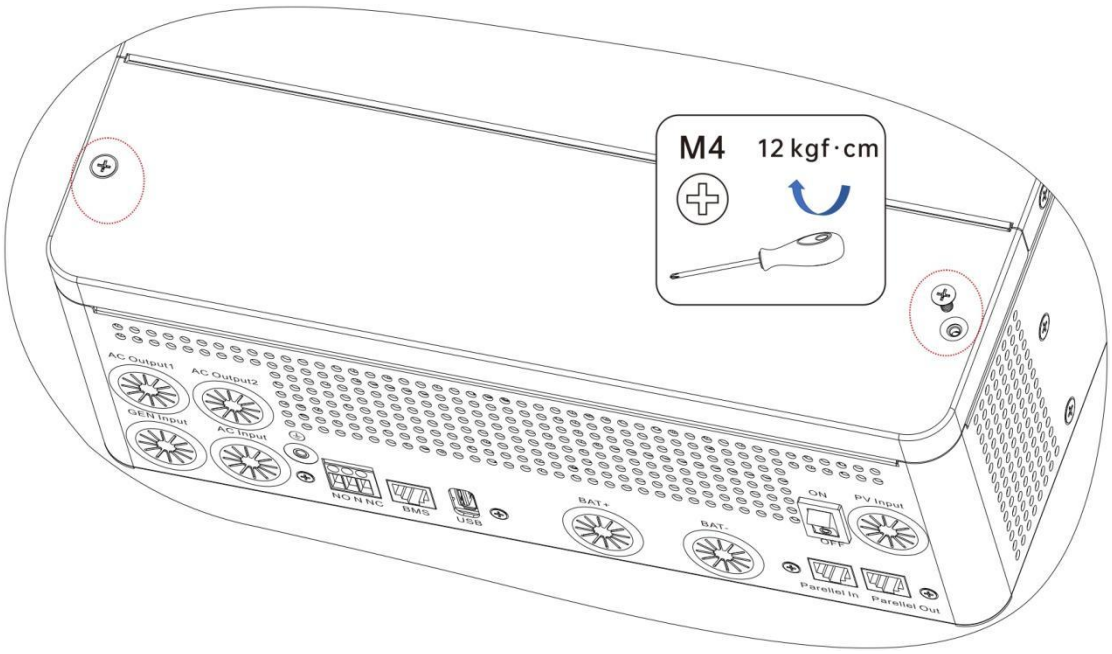
(6) Shell earthing

Please note an additional earthing point on the shell. Clamp the cable with the RNBL5-4 OT terminal and lock it in the position indicated in the figure below. For cable specifications, please refer to the “2.2 Wiring Specifications and Circuit Breaker Selection.”



Step 3: Check whether the wiring is correct and firm, especially whether the battery input anode and cathode are correctly connected, whether positive and negative PV inputs are correctly connected, whether the AC input incorrectly connected to the AC output, and whether the AC input is incorrectly connected to the input port of the diesel generator.

Step 4: Use a Phillips screwdriver to reinstall the terminal cover on the device. The torque is12 kgf.cm.



Step 5: Start the inverter

First, close the circuit breaker of the battery, and switch the inverter's rocker switch to the "ON" state. The blinking "AC" indicator indicates the normal operation of the inverter. Then, close the circuit breaker of the PV panel and the grid, and turn on the AC load after the AC output is normal. In this case, the inverter will work normally in accordance with the set mode.

Notes: If energy is supplied to different AC loads, it is recommended to turn on the load with a large impulse current first, and then turn on the load with a small impulse current after the load works stably, in order to avoid the protection action caused by a large transient impulse generated by turning on the load at the same time. If the inverter fails to work normally, and the LCD or indicator displays abnormality, please refer to Section 7 for troubleshooting.

5.4 Parallel Connection and Wiring

5.4.1 Introduction to Parallel Connection

1) The inverter supports upto 9 in parallel connection.
2) It is necessary to ensure that the parallel wiring is correct and firm with a gap of 300 mm between devices reserved in the use of the parallel function.

5.4.2 Guidance and Schematic Diagram of Single-phase Parallel Connection

1) AC IN wiring:

L,N and PE wires of all inverters must be connected to the same wires respective ly.Make sure the connection is correct and the wire length and diameter are the same before power-on and startup to avoid abnormal output of the parallel system. Multiple different AC power sources are not allowed to ensure the consistency and uniqueness of the AC source.

2) AC OUT wiring

L,N and PE wires of all inverters must be connected to the same wires respective ly. Make sure the connection is correct and the wire length and diameter are the same

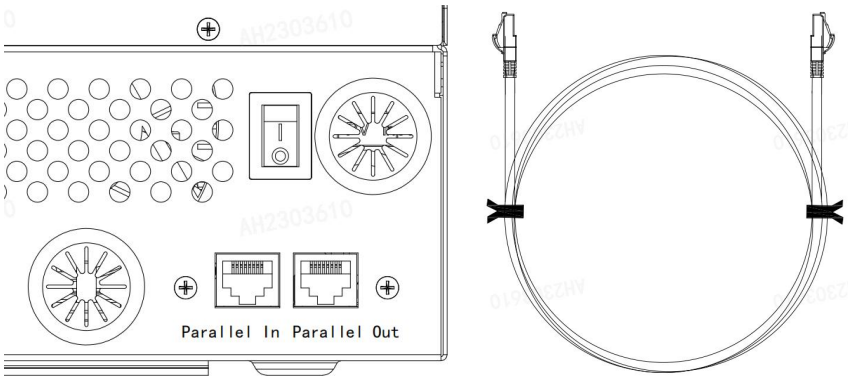
before power-on and startup to avoid abnormal output of the parallel system.

3) BAT wiring

All inverters must be connected to the same battery, BAT+ must be connected to BAT+, and BAT- must be connected to BAT-. Make sure the connection is correct and the wire length and diameter are the same before power-on and startup to avoid abnormal output of the parallel system.

4) Parallel communication wiring

The parallel communication cable is a network cable, and each device is connected with one input cable and one output cable. The left network interface is used for output and the right network interface for input. The parallel communication cable shall be inserted in place to avoid system abnormality caused by poor communication.



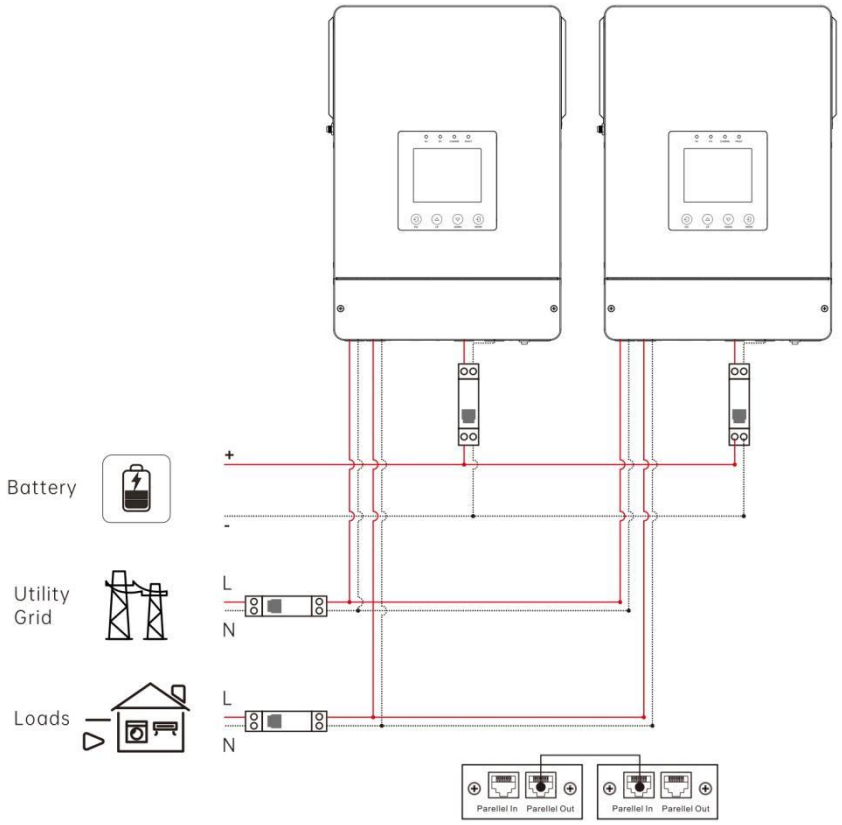
5) Note

Before and after connecting the system, please refer to the system wiring diagram in detail to ensure that all wiring is correct and reliable before power-on. If a new device needs to be connected after the system is properly wired, powered on and operates normally, please disconnect the battery input, PV input, AC input, AC output, and diesel generator input, and re-wire and incorporate into the system after all inverters are power-off detected by a multimeter.

6) Schematic diagram

In case of a single-phase parallel connection of multiple inverters, please conduct wiring according to the schematic diagram below:

(1) Parallel connection of two inverters:



(2)Single-phase Parallel Configuration

1) Supported Units: 2 to 9 inverters.
2) Battery Connection: All inverters must share the same battery bank (BAT+ to BAT+, BAT- to BAT-).
3) Communication: A parallel communication cable (network cable) must be correctly connected; otherwise, the inverter will default to stand-alone mode.

(3)Parameter Settings:

1) Param 29 (CAN Address):

Master inverter: 0

Slave inverters: 1, 2, 3... (increment sequentially)

2) Param 30 (Parallel Mode): Set to PAL (Single-phase parallel mode) for all inverters.
3) Param 31 (Device Type):

Master inverter: MAS (Master)

Other inverters: SAL (Slave)

Device No.	Param 29 (CAN Address)	Param 30 (Parallel Mode)	Param 31 (Device Type)
Inverter 1	0	PAL (Single-phase Parallel)	MAS (Master)
Inverter 2	1	PAL (Single-phase Parallel)	SAL (Slave)
Inverter 3	2	PAL (S-phase Parallel)	SAL (Slave)
Inverter 4	3	PAL (Single-phase Parallel)	SAL (Slave)
...	...	PAL (Single-phase Parallel)	SAL (Slave)

(4)Startup Procedure:

Power the system from the battery without connecting the grid and load breaker.

Configure parameters for each inverter.

After settings, wait 10 seconds for the parallel fault to clear.

Disconnect the battery, power off, then close the grid/load breaker and reconnect the battery.

5.4.4 Guidance and Schematic Diagram of Three-phase Parallel Connection

1. AC IN wiring:

N and PE wires of all inverters must be connected to identical wires. L wires of all devices in the same phase shall be connected together, but the L wires of AC input in different phases cannot be connected together. Other precautions shall be consistent with those of the single-phase parallel connection.

2. AC OUT wiring

N and PE wires of all inverters must be connected to identical wires. L wires of all devices in the same phase shall be connected together, but the L wires of AC output in different phases cannot be connected together. Other precautions shall be consistent with those of the single-phase parallel connection.

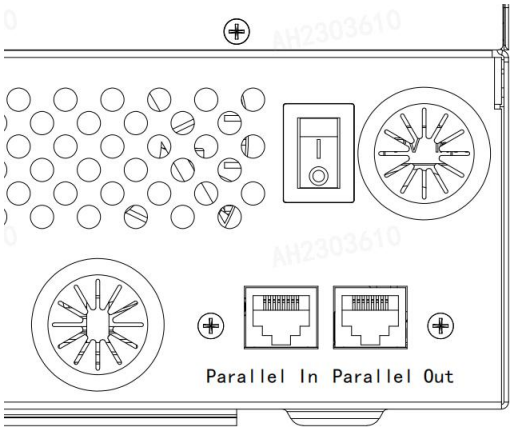
3. BAT wiring

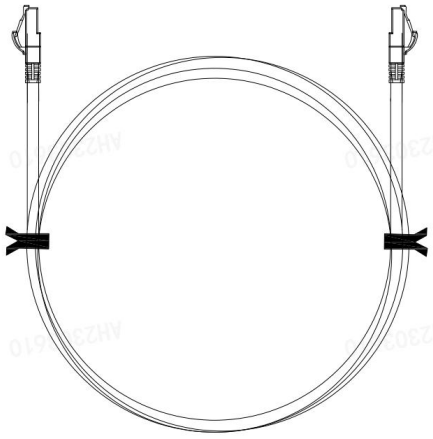
All inverters must be connected to the same battery. BAT+ must be connected to BAT+, and BAT- must be connected to BAT-. Make sure the connection is correct and the wire length and diameter are the same before power-on and startup to avoid

abnormal output of the parallel system.

4. Parallel communication cable

The parallel communication cable is a network cable, and each device is connected with one input cable and one output cable. The left network interface is used for output and the right network interface for input. The parallel communication cable shall be inserted in place to avoid system abnormality caused by poor communication.





5. Note

Before and after connecting the system, please refer to the system wiring diagram in detail to ensure that all wiring is correct and reliable before power-on. If a new device needs to be connected after the system is properly wired, powered on and operates normally, please disconnect the battery input, PV input, AC input, AC output, and diesel generator input, and re-wire and incorporate into the system after all inverters are power-off detected by a multimeter.

6. Setting

(1)Three-phase Parallel Configuration

Supported Units: 3 to 9 inverters (typical arrangements: 1+1+1, 2+2+1, 2+2+2, etc.).

Battery Connection: All inverters must connect to the same battery bank.

AC Input/Output Wiring:

N and PE wires are common to all inverters.

L lines are connected by phase (L1, L2, L3) and must not be mixed.

Communication: Use parallel network cables, connecting left port as output and right port as input.

(2)Parameter Settings:

Param 29 (CAN Address):

Phase A inverter: 0

Phase B inverter: 1
Phase C inverter: 2
(3)Param 30 (Parallel Mode):
Set to 3P1 (Phase A), 3P2 (Phase B), or 3P3 (Phase C) depending on phase.
(4)Param 31 (Device Type):
Master inverter: MAS (Master)
Other inverters: SAL (Slave)

Device No.	Param 29 (CAN Address)	Param 30 (Parallel Mode)	Param 31 (Device Type)
Inverter 1	0	3P1 (Phase A of Three-phase Mode)	MAS (Master)
Inverter 2	1	3P2 (Phase B of Three-phase Mode)	SAL (Slave)
Inverter 3	2	3P3 (Phase C of Three-phase Mode)	SAL (Slave)
Inverter 4	3	3P1 or 3P2/3P3 (depends on phase)	SAL (Slave)
…	…	3P1/3P2/3P3 (as required)	SAL (Slave)

(5)Startup Procedure:
Power the system from the battery only.
Configure parameters for each phase inverter.
Wait 10 seconds for parallel synchronization.
Disconnect battery, then close the grid/load breaker and reconnect the battery to enter three-phase mode.

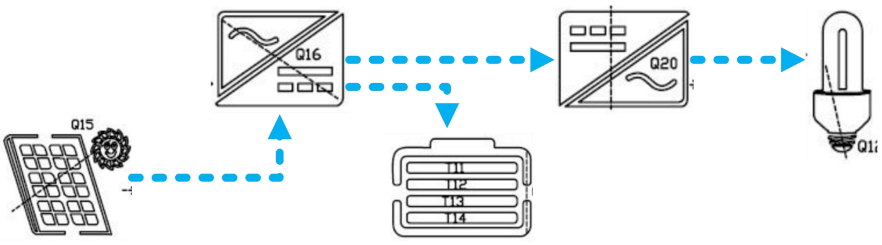
6Working Modes

6.1 Power Supply Modes

- PV power priority mode:

This mode prioritizes PV power for power supply to the load. When the PV power is unavailable, grid and battery will supply power to maximize the use of solar power generation and maintain the battery power. This working mode is suitable for areas with a relatively stable power grid. The priority of power supply realized at the load side is PV power -> Grid -> battery.

With PV energy input:



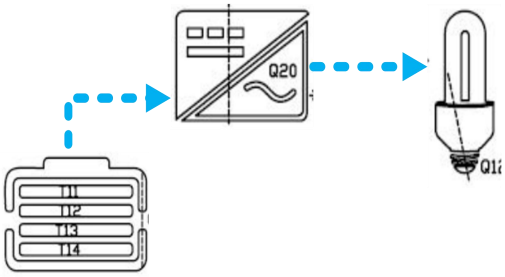
Without PV energy input:

➢ Grid priority mode

This mode prioritizes grid for power supply to the load. Battery inverter power supply will be applied only when the grid is unavailable, and grid charging and power supply will be applied when the grid is available. If there is PV power, PV power will charge the battery first, and the surplus energy and grid will be output to the load in a complementary way, maximizing the use of solar energy, reducing the use of grid, and keeping the battery power. This mode is suitable for areas with an unstable power grid. The priority of power supply realized at the load side is: Grid -> PV power -> battery.

With grid input:

Without grid input:



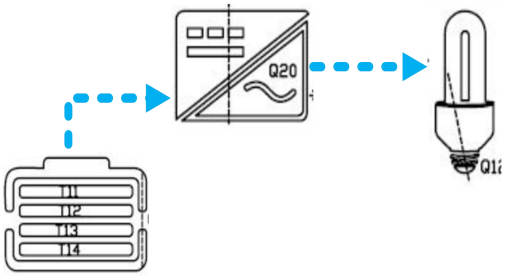
➢ Inverter priority mode:

In this mode, the grid will be applied for power supply only when the battery voltage is lower than the setting point (setting item 05), and the battery discharging mode will be applied when the battery charging voltage is higher than the setting point (setting item 06), so as to repeat the battery charging and discharging cycle. If there is PV power, PV power will maximize the use of solar energy according to PV

energy and battery charging and discharging states. This mode is used in areas with a stable power grid. The priority of power supply at the load side is: PV power -> battery -> grid.

When the battery voltage is lower than the set point (05 setting item), switch to grid supply

The battery voltage is higher than the grid-to-battery voltage, switch to battery inverter

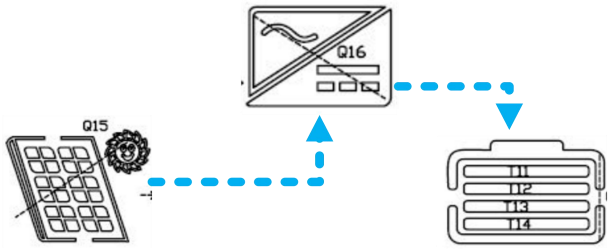


6.2 Charging Modes

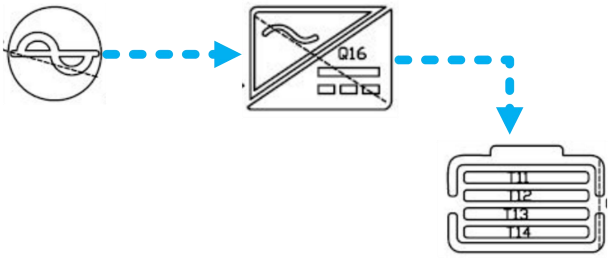
- PV charging priority:

PV power gives priority to charging the battery, and the grid charging is only started when PV power does not meet the working conditions. This mode can make full use of solar energy to charge in the daytime and switches to grid at nighttime to keep the battery power, which is used in areas with a relatively stable power grid and relatively expensive electricity price.

With PV energy input:

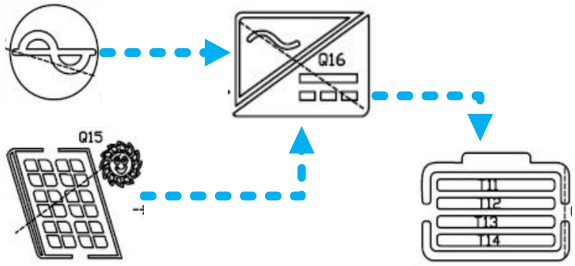


Without PV energy input:



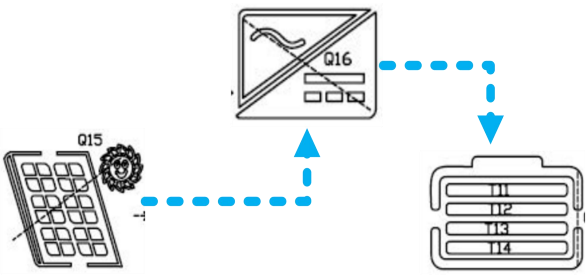
➢ Hybrid charging:

As for hybrid charging of PV energy and grid, PV energy charging is preferred with grid as a supplement when PV energy is insufficient. This mode mainly meets the requirement for maximum charging power with the fastest charging speed. It is suitable for areas with an unstable power grid, providing sufficient backup power supply.



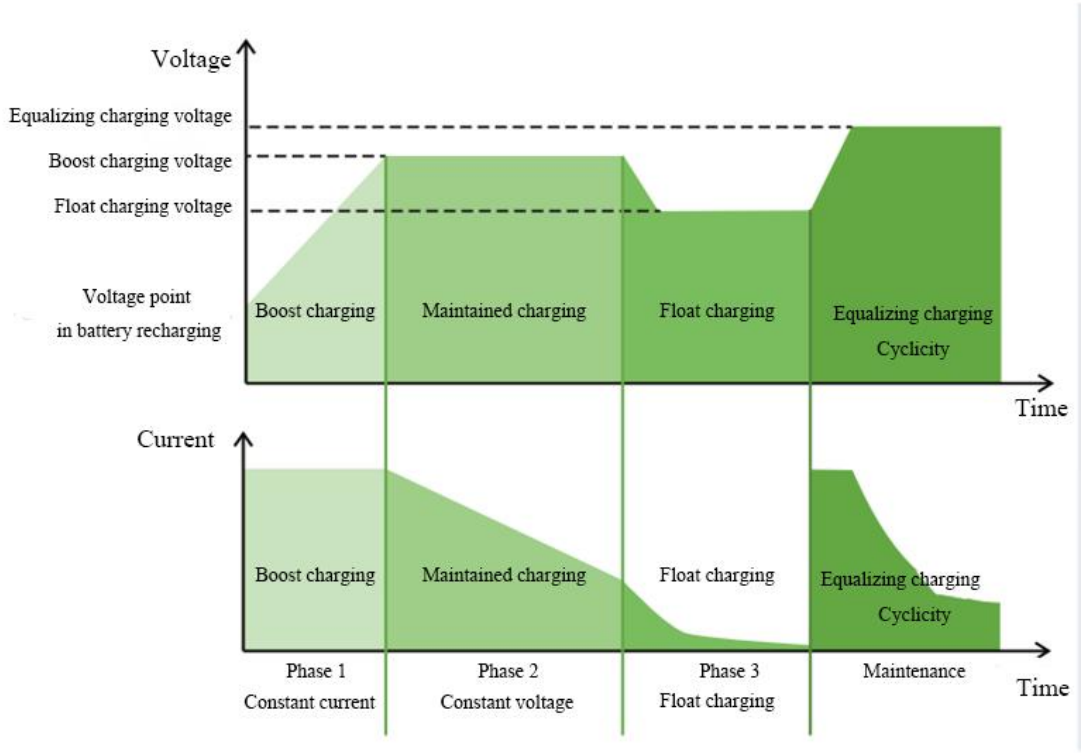
➢ PV charging mode only

Only the PV energy is used to charge the battery without grid. This mode is the most energy-saving one because the battery power comes from PV solar energy, which is usually used in areas with good lighting conditions.



6.3 Battery Charging Parameters

➢ The charging curve of the lead-acid battery is shown in the figure below:

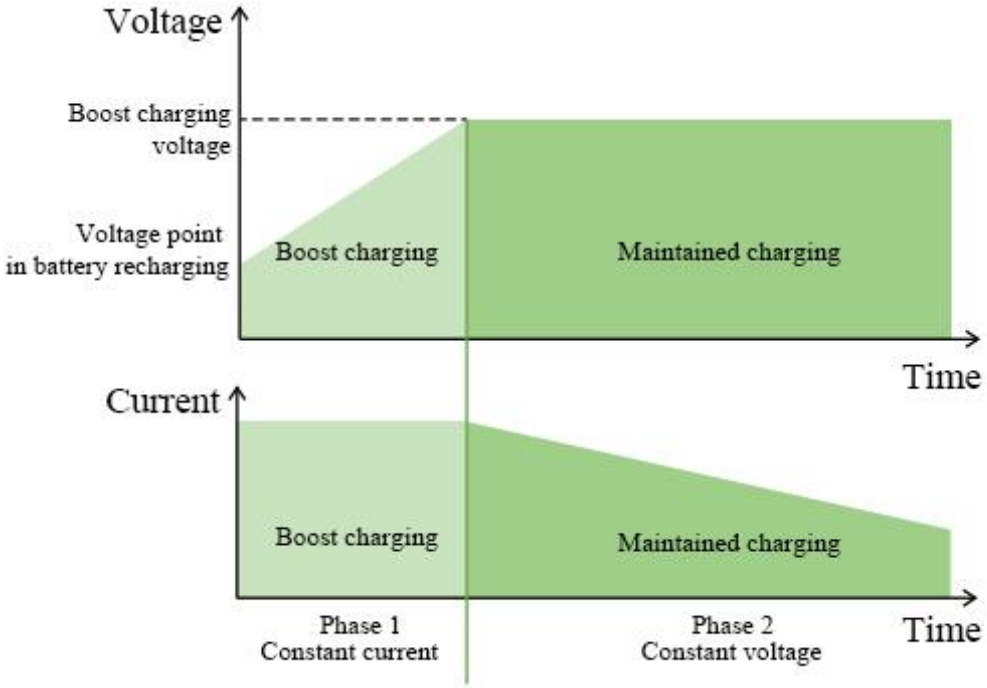


➢ The charging parameters of the lead-acid battery are shown in the table below:

	Gel lead-acid (GEL)	Sealed lead-acid (SLD)	Flooded lead-acid (FLD)	Customized (USER)
Over-voltage disconnect threshold	60V	60V	60V	36~60V (Adjustable)
Recovery voltage in recharging after fully-charged	52V	52V	52V	52V (Adjustable)
Boost charging voltage	56.8V	57.6V	58.4V	36~60V (Adjustable)
Float charging voltage	55.2V	55.2V	55.2V	36~60V (Adjustable)

	Gel lead-acid (GEL)	Sealed lead-acid (SLD)	Flooded lead-acid (FLD)	Customized (USER)
Equalizing charging voltage	56.8V	58V	59.2V	36~60V (Adjustable)
Under voltage alarm threshold	44V	44V	44V	36~60V (Adjustable)
Under voltage recovery threshold	Under voltage alarm threshold + 0.8V			
Low-voltage disconnect threshold	42V	42V	42V	36~60V (Adjustable)
Low-voltage recovery	52V	52V	52V	52V (Adjustable)
Discharging limited voltage	40V	40V	40V	36~60V (Adjustable)
Over-discharge (detection) delay time	5s	5s	5s	1~30s (Adjustable)
Equalization duration	-	120 min	120 min	0~600 min (Adjustable)
Equalizing charging interval	-	30 days	30 days	0~250 days (Adjustable)
Boost charging duration	120 min	120 min	120 min	10~600 min (Adjustable)

➢ The charging curve of the lithium battery is shown in the figure below:



➢ The charging parameters of the lithium battery without BMS communication are shown in the table below:

	LiFePO4 (L14)	LiFePO4 (L15)	LiFePO4 (L16)	Ternary lithium (N13)	Ternary lithium (N14)
Over-voltage disconnect threshold	60V	60V	60V	60V	60V
Recovery voltage in recharging after fully-charged	47.6V	50.4V	53.6V	50.4V	54.8V
Boost charging voltage	49.2V	53.2V	56.8V	53.2V	57.6V
Float charging voltage	49.2	53.2V	56.8V	53.2V	57.6V
Under voltage alarm threshold	43.2V	46.4V	49.6V	43.6V	46.8V

	LiFePO4 (L14)	LiFePO4 (L15)	LiFePO4 (L16)	Ternary lithium (N13)	Ternary lithium (N14)
Under voltage recovery threshold	Under voltage alarm threshold + 0.8V				
Low-voltage disconnect threshold	42V	45.6V	48.8V	38.8V	42V
Low-voltage recovery	46V	49.6V	52.8V	46V	49.6V
Discharging limited voltage	40.8V	43.6V	46.4V	36.4V	39.2V
Over-discharge (detection) delay time	30s	30s	30s	30s	30s
Equalization duration	120 min	120 min	120 min	120 min	120 min

7 Operating Instructions for LCD Screen

7.1 Operation and Display Panel

- The operation and display panel include one display screen, four indicators, and four keys, as shown in the figure below.

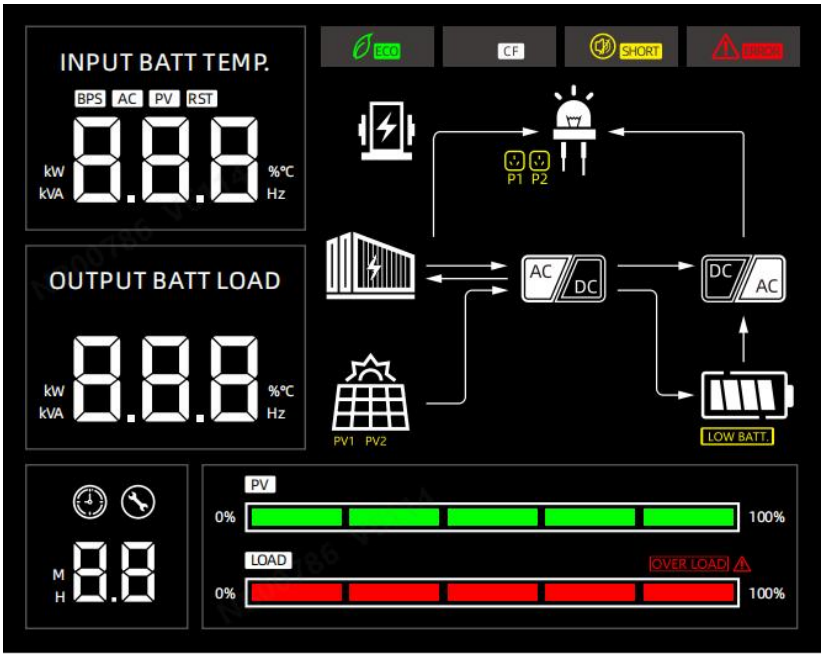
- Description of the horse race lamp

Horse race lamp	Color	Description
DC	green lighting breathing effect	When multiple interfaces are connected, the corresponding color lights will breathe in turn
CHARGE	blue lighting breathing effect	
AC	white lighting breathing effect	
FAULT	red light flash effect	

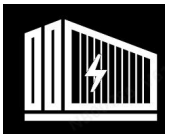
➢ Description of the keys

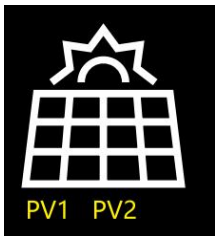
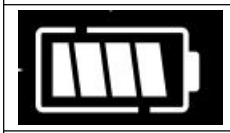
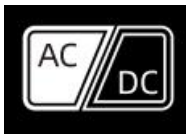
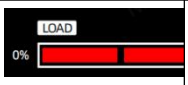
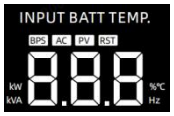
Function key	Description
	When out of the setting function, (on the Display menu or the Settings menu), the key is used for turning pages: click UP to turn the page up and click DOWN to turn the page down. When setting the parameters, the key is used to increase or decrease parameters;
	
	On the Display menu, click to back to the first page. On the Settings menu, click to exit.
	Press and hold it for 2s to enter the Settings menu and click to enter or confirm the options.

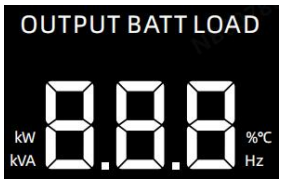
➢ Introduction to Display Panel



➢ Introduction to the icons on the display panel

Icon	Description	Icon	Description
	The AC input port is connected to an AC input		The inverter circuit is working

Icon	Description	Icon	Description
	PV connected to solar panels		AC output is in overload condition
	Device connected to battery		AC output load percentage
	The battery voltage is too low (battery SOC is less than 5%)		Buzzer is not enabled (mute)
	AC/PV charging circuit is working		The device has an alarm event
	AC output terminal has AC voltage output		The device is in a fault state
	The device is in setup mode		Energy saving mode icon
	Parameters are displayed in the lower left corner of the screen, 1. In non-setting mode, it displays the current real-time parameter page number; 2. In setting mode, it displays the current setting page number		
Parameters displayed on the left side of the screen: Equipment input parameters			
	AC Input		PV Input
	The icon is not displayed		Displays battery voltage, total battery charging current, AC charging power, AC input voltage, AC input frequency, PV input voltage, internal heat sink temperature, software

Icon	Description	Icon	Description
			version
Parameters displayed on the right side of the screen: Device output parameters			
		Indicates output voltage, output current, output active power, output apparent power, battery discharge current, software version, alarm code, fault code; in setting mode, displays the setting parameters under the currently set parameter item code;	
Arrow indication			
①	Power grid to load	②	Grid power supply to charging circuit
③	PV power supply to charging circuit	④	The charging circuit charges the battery
⑤	The arrow is not displayed	⑥	The battery supplies power to the inverter circuit
⑦	The inverter circuit supplies power to the load		

➢ Real Time Data Check

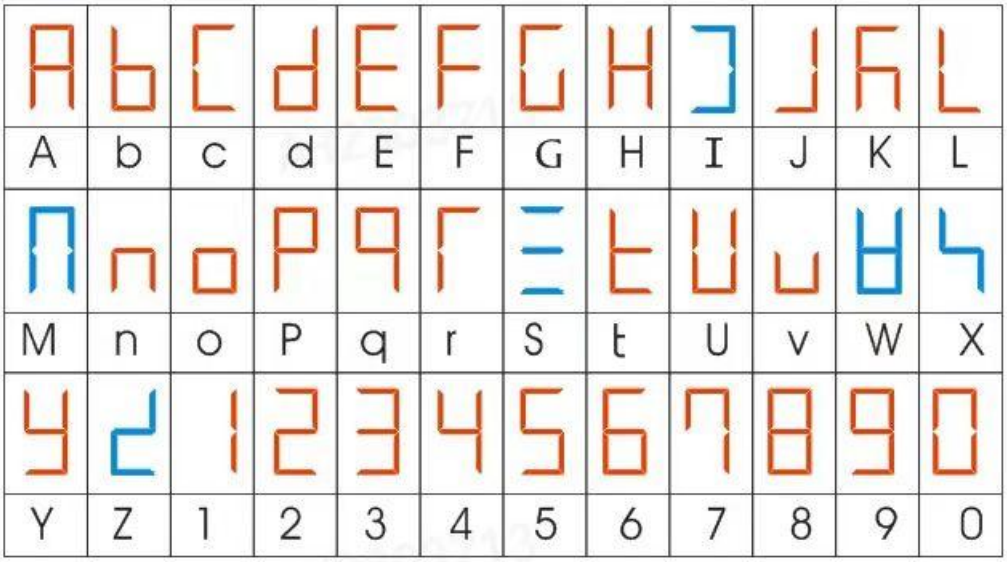
Under normal conditions, the display has 15 pages. If no fault occurs, the parameter screen is in a polling state and automatically turns the page every three seconds, displaying information about input and output voltages, input and output frequencies, battery, PV voltages and currents, loads, software version, and fault alarms. If any fault message appears, the red light will remain on and you will need to go to page 15 to check the fault code.

Click UP or DOWN to scroll up and down the display interface and stay at the current interface for 10 seconds; click ESC to jump to the first page of real-time parameters; click ENTER to stay at the current display interface for 100 seconds; press and hold ENTER for more than two seconds to enter the setting interface. The real-time parameter interface information is as follows:

Page	Parameter on the left of the screen	Parameter on the right of the screen
1	INPUT BATT V	OUTPUT LOAD V
2		PV OUTPUT KW

Page	Parameter on the left of the screen	Parameter on the right of the screen
3	PV INPUT V	PV Output A
4	INPUT BATT A	OUTPUT BATT A
5	INPUT BATT KW	OUTPUT BATT KW
6	AC INPUT Hz	AC OUTPUT LOAD Hz
7	AC INPUT V	AC OUTPUT LOAD A
8		OUTPUT LOAD KVA
9		INV OUTPUT LOAD KW
10	DSP software version	ARM software version
11	Model and battery voltage level (48V)	Output power level (6KW)
12	Model and PV voltage level (500V)	Model and PV current level (27A)
13	RS485 address	Phase sequence display
14		Alarm code
15		Fault code

7.2 Parameter Settings



- In the default interface, press and hold ENTER for more than two seconds to enter the Settings interface, and click ESC to exit to the real-time parameter display interface.
- Project abbreviations can be found in the image above

Settings	Parameter	Option	Description
【1】	On/Off Settings(POF)	OFF	Standby mode
		ON (Default)	Normal operating mode
【2】	Power supply priority (WFM)	SOL	It indicates the PV power priority mode. When there is no PV input or the battery is

Settings	Parameter	Option	Description
			lower than the value set in parameter [05], the load automatically switches to the grid supply.
		UTI (Default)	It indicates the grid priority mode. It switches to the battery inverter power supply only when there is no grid input.
		SBU	It indicates the inverter power priority mode. It switches to the grid power supply only when the battery voltage is lower than the value set in parameter [05]; it switches to battery discharging and inverter power supply only when the battery is fully charged or higher than the value set in parameter [06].
【3】	Off-grid output frequency (OPF)	50Hz (Default)	Bypass adaptive function: when there is grid, it automatically adapts to the frequency of the first grid-on; When there is no grid, the output frequency can be set on the menu, and the default output of 230V AC inverter is 50 Hz.
		60Hz	
【4】	Input mode (GVR)	APL	A wide grid input voltage range for 230V device: 90~280VAC, applicable to household appliances.
		UPS (Default)	A narrow grid input voltage range for 230V device: 170~265VAC, applicable to computers, etc.
【5】	Battery-to-grid voltage (BTG)	46V (Default)	The default battery-to-grid supply voltage is 46V, with a setting range of 44V~52V and a step of 0.5V. When parameter [02] = SBU, the battery voltage is lower than the set value, and the output is switched from the inverter to the grid supply.This setting item is only applicable to lead-acid batteries. For BMS lithium battery settings, please refer to setting item [43].
【6】	Grid-to-battery voltage (GTB)	54V (Default)	The default grid-to-battery voltage is 54V, with a setting range of 48~58V and a step of 0.5V. When parameter [02] = SBU, the battery voltage is higher than the set value, and the output is switched from the grid to the

Settings	Parameter	Option	Description
			inverter power supply.This setting item is only applicable to lead-acid batteries. For BMS lithium battery settings, please refer to setting item [44].
【7】	Charging priority (CHM)	CSO	PV priority charging: The grid will be applied to charge the battery only when the PV power is unavailable.
		SNU (Default)	Hybrid charging of PV and grid power: PV power charging is preferred with grid power as a supplement when PV energy is insufficient. When the PV energy is sufficient, grid stops charging. Note: Only when the grid bypass output is loaded, PV and grid charging can be applied simultaneously. When the inverter is working, the PV power will be applied to charge the battery.
		OSO	PV charging only, without grid.
【8】	Maximum charging current of the battery (MCC)	20A (Default)	The default maximum charging current of the battery is 60A, with a setting range of 1~120A and a step of 1A.
【9】	Lead-acid battery subtype (BTP)	USE	Customized battery: Users can set all battery parameters.
		SLD	Sealed lead-acid battery: with a constant-voltage charging voltage of 58.4V and a float charging voltage of 57.6V.
		FLD	Flooded lead-acid battery: with a constant-voltage charging voltage of 58.4V and a float charging voltage of 55.2V.
		GEL (Default)	Gel lead-acid battery: with a constant-voltage charging voltage of 56.8V, and a float charging voltage of 55.2V.
		L14/L15/L16	LiFePO4 batteries L16/L15/L14 correspond to series 16, 15 and 14 of LiFePO4 batteries. The default constant-voltage charging voltage of series 16, 15, and 14 is 56.8V, 53.2V, and 49.2V respectively, which can be adjusted.
		N13/N14	Adjustable ternary lithium batteries. The default constant-voltage charging voltage of series N13 is 53.2V, and the default constant-voltage charging voltage of series

Settings	Parameter	Option	Description
			N14 is 57.6V.
		LIT	The setting enables the inverter to be compatible with non-communicating lithium batteries, as the inverter has lithium battery activation function. Under this mode, lithium battery charging and discharging are based on defined parameters. Users need to input charging and discharging parameters corresponding with battery information, otherwise the battery will be damaged.
【10】	Battery charging CV voltage (ICV)	56.8V (Default)	The default CV voltage is 56.8V, with a setting range of 48~59.2V and a step of 0.4V. It is valid when the battery type is customized battery and lithium battery.
【11】	Maximum boost charging duration (ICT)	120min (Default)	The default maximum boost charging duration is 120 min, with a setting range of 5~900 min, and a step of 5 min. It refers to the maximum charging duration when the voltage reaches the voltage set in parameter [11] during constant-voltage charging.
【12】	Float charging voltage (FLV)	55.2V (Default)	The default float charging voltage is 55.2V, with a setting range of 48~58.4V and a step of 0.4V.
【13】	Battery under voltage alarm threshold (BUA)	44V (Default)	The default under voltage alarm threshold of the battery is 44V, with a setting range of 40~50V, and a step of 0.4V. When the load is less than 50% of the rated power, if the battery voltage falls below this threshold, an under-voltage alarm will be triggered. When the load exceeds 50% of the rated power, if the low-voltage alarm point is 2V lower than the set value, and the inverter output will not be shut down.
【14】	LV Voltage (BLV)	42V (Default)	The default LV voltage is 42V, with a setting range of 40~52V and a step of 0.4V. When the load is less than 50% of the rated power, if the battery voltage falls below this threshold, the inverter output will shut down immediately. When the load is higher than the rated power, if the battery voltage is 1V lower than the set value, the inverter output will be shut down immediately.

Settings	Parameter	Option	Description
			It is valid when the battery type is customized battery and lithium battery.
【15】	Equalizing charging mode enabled (EQE)	DIS (Default)	Equalizing charging is prohibited.
		ENA	If equalizing charging is enabled, it is only valid under flooded lead-acid batteries, sealed lead-acid batteries, and customized batteries.
【16】	Equalizing Charging Voltage (EQV)	58.4V Default)	The default equalizing charging voltage is 58.4V, with a setting range of 48~58.4V and a step of 0.4V. It is only valid under flooded lead-acid batteries, sealed lead-acid batteries, and customized batteries.
【17】	Equalizing charging duration (EQT)	120 min (Default)	The default equalizing charging duration is 120 min, with a setting range of 5~900 min and a step of 5 min It is only valid under flooded lead-acid batteries and sealed lead-acid batteries.
【18】	Equalizing charging delay duration (EQD)	120 min (Default)	The default equalizing charging delay duration is 120 min, with a setting range of 5~900 min and a step of 5 min. It is valid under flooded lead-acid batteries, sealed lead-acid batteries, and customized batteries.
【19】	Equalizing charging interval (EQC)	30 days (Default)	The default equalizing charging interval is 30 days, with a setting range of 0~30 days and a step of 1 day. It is only valid under flooded lead-acid batteries, sealed lead-acid batteries, and customized batteries.
【20】	Start equalizing charging immediately (EQI)	DIS (Default)	Stop equalizing charging immediately.
		ENA	Turn on equalizing charging immediately.
【21】	Energy-saving mode enabled (ESM)	DIS (Default)	Energy-saving mode is prohibited
		ENA	After the mode is enabled, if the inverter output load is empty or less than 50W, turn off the output after the inverter output is delayed for a period. When the load is greater than 50W, the inverter starts automatically.
【22】	Overload Auto Restart (OLR)	DIS	When overload auto restart is prohibited, if overload occurs, turn off the output, and the device will never restart.
		ENA (Default)	When overload auto restart is enabled, if overload occurs, turn off the output, and the

Settings	Parameter	Option	Description
			first restoration takes 30 seconds, the second restoration takes 30 seconds, and the third restoration takes 1 hour..
【23】	Over-temperature restart enabled (OTR)	DIS	When over-temperature auto restart is prohibited, if over-temperature occurs, turn off the output machine and the inverter output will not restart.
		ENA (Default)	When over-temperature auto restart is enabled, if over-temperature occurs, turn off the output, and the AC inverter output will be restarted after the temperature drops.
【24】	Buzzer switch (BAL)	DIS	The buzzer alarm is prohibited with a muse mode.
		ENA (Default)	The buzzer alarm is enabled.
【25】	Mode switching reminder enabled (MTR)	DIS	When the state of the main input source changes, an alarm reminder of the device is prohibited.
		ENA (Default)	When the state of the main input source changes, an alarm reminder of the device is enabled.
【26】	Overload-to-bypass enabled (ITB)	DIS	It is prohibited to automatically switch to the grid supply when the inverter is overloaded.
		ENA (Default)	It automatically switches to the grid supply when the inverter is overloaded.
【27】	Limit current of AC charging (ACM)	60A (Default)	The default limited current is 60A for AC battery charging, with a setting range of 1~100A and a step of 1A.
【28】	Split-phase output enabled (OSP)	DIS (Default)	This function is prohibited.
		ENA	Output with power frequency transformer is enabled.
【29】	Device communication address (PDI)	0 (Default)	The parallel mode of the device shall be set with a range of 0~9.
【30】	Parallel mode (only available under the standby mode) (PMD)	SIG (Default)	Settings for the standalone use of the device.
		PAL	Settings for the single-phase parallel use of the device.
		3P1/3P2/3P3	Settings for the three-phase parallel use. All machine screens connected to P1 should be set to “3P1”; All machine screens connected to P2 should be set to “3P2”; All machine screens connected to P3 should

Settings	Parameter	Option	Description
			be set to “3P3”; Suppose that when the output voltage in the setting [36] is 230V AC (the model supporting parallel connection): In this case, the voltage phases between (P1-P2, P1-P3, P2-P3) are different by 120 degrees, and the voltage between the live wire L1 of P1 phase and the live wire L2 of P2 phase is 230*1.732=398V AC. Likewise, the wire voltage between L1-L3 and L2-L3 is 398V AC; The voltage between L1-N, L2-N and L3-N is 230V AC.
【31】	Type of parallel equipment(PDT)	MAS (Default)	Select the current device as the host. If the parallel mode setting is 3P1, this item will be automatically selected as the host type
		SAL	Select the current device as the slave
【32】	BMS communication mode (BMS)	DIS (Default)	Do not select BMS communication.
		CAN	Select CAN as BMS communication.
		485	Select RS485 as BMS communication.
【33】	Battery communication protocol (BDS)	PYL (Default)	When setting [32] =CAN or 485, it is needed to select the corresponding lithium battery manufacturer/brand for communication. PYL=PYLONTECH
【34】	Low-voltage recovery threshold (LVR)	52V (Default)	The default recovery threshold for low-voltage disconnection battery voltage is 52V, with a setting range of 50~58V and a step of 0.5V. When the inverter output is disconnected due to the battery’s low voltage, the battery inverter AC output can be recovered when the battery voltage is higher than this set value.
【35】	Battery recharging recovery threshold (BRC)	52V (Default)	The default battery recharging recovery threshold is 52V, with a setting range of 50~56V and a step of 0.5V. After the battery is fully charged, the inverter charging stops, and the battery charging can be recovered when the battery voltage is lower than this voltage value.
【36】	Off-grid output voltage (GOV)	230V (Default)	The default off-grid output voltage is 230V, with an optional setting of 200/208/220/230/240V.
【37】	Generator auto	DIS (Default)	This function is prohibited.

Settings	Parameter	Option	Description
	input enabled (GAE)	ENA	After this function is enabled, when the grid fails and the battery voltage reaches the low-voltage disconnection threshold, the dry contact starts the generator to supply power to loads and charge batteries. When the grid recovers, the power supply will be switched from the generator to the grid.
【38】	Dual-load enabled (DLE)	DIS	This function is prohibited.
		ENA (Default)	AC Output1 connects to a critical load, and AC Output2 connects to a non-critical load (usually a high-power load). When the battery voltage is lower than the value set in [39], AC Output2 will be disconnected.
【39】	Non-critical load disconnection battery voltage (LDV)	46V (Default)	The default non-critical load disconnection battery voltage is 46V, with a setting range of 42~54V and a step of 0.5V.
【40】	High-voltage disconnect threshold (HDV)	60V (Default)	The default battery input high-voltage disconnect threshold is 60V, with a setting range of 30~60V and a step of 0.5V. The inverter output will be shut down if the voltage is too high.
【41】	Battery low-voltage shutdown voltage (delayed shutdown) (BDL)	40V (Default)	The default battery low-voltage shutdown voltage is 40V, with a setting range of 40~48V and a step of 0.4V. When the battery voltage is lower than the threshold and the parameter 42 is triggered, the inverter output will be shut down. It is valid when the battery type is customized batteries and lithium batteries.
【42】	Battery over-discharge (detection) delay time (BOD)	5s (Default)	The default battery over-discharge (detection) delay time is 5s, with a setting range of 5~50s and a step of 5s. When the battery voltage is lower than the parameter [41] and the delay time set in the parameter is triggered, the inverter output will be shut down. It is valid when the battery type is customized batteries and lithium batteries.
【43】	On-grid discharge cutoff SOC (GSD)	50 (Default)	The default On-grid discharge cutoff SOC is 50, with a setting range of 10~ 90 and a step of 10.

Settings	Parameter	Option	Description
			Lithium batteries end discharge to recover SOC under hybrid loads of the grid and the battery.Only valid for BMS communication lithium batteries.
【44】	On-grid end-of-discharge recovery SOC (GRD)	90 (Default)	The default On-grid end-of-discharge recovery SOC is 90, with a setting range of 20~100 and a step of 10. Lithium batteries end discharge to recover SOC under hybrid loads of the grid and the battery.Only valid for BMS communication lithium batteries.
【45】	Off-grid discharge cutoff SOC (OSD)	20 (Default)	The default off-grid discharge cutoff SOC is 20, with a setting range of 5~ 90 and a step of 5. End-of-discharge SOC of lithium batteries under disconnected grid-tied relay and loaded battery.Only valid for BMS communication lithium batteries.
【46】	Off-grid end-of-discharge recovery SOC (ORD)	30 (Default)	The default off-grid end-of-discharge recovery SOC is 30, with a setting range of 10~ 100 and a step of 10. End-of-discharge SOC of lithium batteries under disconnected grid-tied relay and loaded battery.Only valid for BMS communication lithium batteries.
【47】	Bluetooth enabled (BTE)	DIS	This function is prohibited.
		ENA (Default)	Turn on Bluetooth.
【48】	Anti reverse mains power setting(GPC)	40(Default)	Set the input power from the Grid under grid connected conditions, The larger the setting value, the better the anti reverse effect. Range 0-200W, step 5.
【49】	Grid Feedinged enablement(GFE)	DIS(Default)	This function is prohibited.
		ENA	When the input power priority is in the mains priority mode, the inverter is enabled to feed power to the grid, and excess photovoltaic energy can be fed into the grid after inversion.This item requires password (618) verification to allow setting.
【50】	Charging cut-off SOC	100(Default)	When the lithium battery reaches the set SOC value during charging, it stops charging and is only effective for BMS communication lithium battery.

Settings	Parameter	Option	Description
【51】	Restore factory settings	YES	After setting this option, you need to enter a password (618) for verification. Once verified, the system settings parameters will be restored to their factory default values. After the restoration is complete, the system will restart.
【52】	Non-critical load disconnection battery SOC(LDS)	50%(Default)	Turn off AC OUTPUT 2 when battery SOC is lower than the set value.Setting range is 10-100, step value is 5.
【53】	Non-criticalload periodsettings(SLP)	DIS	Disable
		ENA	When ENA is selected, AC output 2 turns on only during the set time period. When ENA is selected, the time setting page is automatically jumped to, the left side is the on time setting and the right side is the off time setting.

- s with lithium battery BMS (customized);
- CAN communicates with lithium battery BMS (customized).

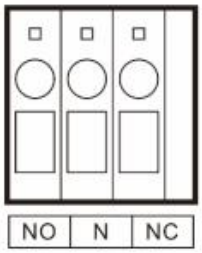
Network port pins are defined as follows:

1	485-B	5	CANL
2	485-A	6	NC
3	GND	7	GND
4	CANH	8	BAT_NTC

7.3Dry Contact Function

This dry contact can control the ON/OFF of the diesel generator to charge the

battery. ① Normally, the NC-N point is closed and the NO-N point is open; ② When the battery voltage reaches the low-voltage disconnection threshold, the relay coil is energized, and the NO-N point is closed while the NC-N point is open. At this point, the NO-N point can drive resistive loads: 125VAC/1A, 230VAC/1A, and 30VDC/1A. The dry contact interfaces are shown in the figure below.



7.4 Wi-Fi Wireless Communication Function

The internal Wi-Fi of the energy storage inverter can be connected to the local router. After the data is uploaded to the server, the user can view the operating parameters and device status anytime and anywhere via the mobile APP while completing some general settings of the inverter with the APP.

8 Protection

8.1 Error Code

Buzzer working logic:

- Alarm: The alarm indicator flashes, and the buzzer beeps once every 1s and lasts for 30s before it stops.
- Fault: The fault indicator code is on, and the buzzer stops after a 10-second beep.

Error type	Error code	Error description
Fault	103	Inverter DC offset is too high
	105	Bypass AC output is overloaded
	200	Off-grid output voltage is too low
	201	Off-grid output voltage is too high
	202	Off-grid output has a short circuit
	203	Off-grid output is overloaded
	204	Abnormal off-grid output DC component offset
	301	Battery open circuit
	305	Battery overvoltage
	306	Battery overcurrent
	307	Battery communication fault
	308	BMS fault
	400	PV overvoltage
	403	PV short circuit
	404	PV reverse connection
	500	Abnormal BUS voltage
	501	Abnormal BUS voltage sampling
	502	Abnormal communication in the device
	505	Abnormal connection of the temperature sensor
	506	Device over-temperature
	507	Abnormal relay
	509	Anti-counter-current output timeout
	510	Mismatched software version
	511	Fan fault
	513	Parallel abnormality
Alarm	103	Grid unavailable
	104	Overrange voltage of grid
	105	Overrange frequency of grid

Error type	Error code	Error description
	106	No output voltage from the generator
	107	Overrange output voltage of the generator
	108	Overrange output frequency of the generator
	302	Low battery
	304	Abnormal BMS information
	305	Low battery voltage alarm
	502	Abnormal memory reading and writing

8.2 Troubleshooting (partial)

Fault Code	**Fault Description**	**Troubleshooting**
202	Off-grid output short circuit	Check whether the load end wiring is short-circuited. Restart the inverter after clearing the short circuit.
203	Off-grid output overload	Restart the inverter after reducing the electric equipment.
301	Battery open circuit	Check whether the battery circuit breaker is switched on and battery cables are connected.
305	Battery overvoltage	Check whether the battery voltage exceeds the protection value and discharge the battery until it is lower the overvoltage recovery value.
306	Battery overcurrent	Restart the inverter after reducing the electric equipment.
308	BMS fault	Check BMS fault information.
400	PV overvoltage	Use a multimeter to check whether the solar energy input voltage exceeds the maximum PV input voltage of the device.
404	PV reverse connection	Check whether the solar energy input wiring is reversed.
506	Device over-temperature	Check whether the heat dissipation hole of the device is blocked by foreign bodies. The device will return to normal operation after cooling down.
511	Fan fault	Check whether the fan is blocked by foreign bodies.
	No display on the screen	Check whether the device switch is ON and whether the battery and PV circuit breaker are switched on; Press any key on the screen to wake up the screen.

9 System Maintenance

- In order to maintain the best performance of the inverter, it is recommended to check the following items three times a year:

① Make sure that the airflow around the inverter is not blocked and remove any dirt or debris from the air intake to ensure the intake air volume.

② Check the wires for electrical leakage caused by poor insulation due to weathering or damage by other objects.

VEICHI

Suzhou Veichi Electric Co., Ltd

No.1000 Songjia Road, Guoxiang street, Wuzhong Economic and Technological Development Zone, Suzhou

Tel：+86-512-6617 1988　　Fax：+86-512-6617 3610
Facebook: https://www.facebook.com/veichigroup
Whatsapp: +86- 138 2881 8903
Https://www.veichi.com/

Official Website

*Version: 1.0，2025