USER MANUAL

Energy Storage Inverter

R3KL1(D)-G2 ~ R8KL1(D)-G2

R3KL1(D)-AC ~ R8KL1(D)-AC

VER.: V2.10

DECLARATION

SHENZHEN MEGAREVO TECHNOLOGY CO., LTD. (hereinafter referred to as "MEGAREVO") reserves the right to modify the frame dimensions, functionality, technical data, parameters, standards without prior notice.

The contents of this manual have been checked for accordance with its described hardware and software. However, the contents of this manual may be subject to appropriate modification as a result of product upgrade, specification change and update of the manual, we cannot guarantee full accordance all the time. But the data in this manual are reviewed regularly and any necessary corrections are included in subsequent editions. Suggestions for improvement from readers are appreciated.

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PREFACE

Thank you for choosing **energy storage inverter (hereinafter referred to as "inverter")** .

This user manual presents a detailed description of with respect to product features, structural characteristics, functions, installation, parameter settings, troubleshooting, commissioning and daily maintenance, etc. Be sure to carefully read through the safety precautions before use and keep it properly at a place for easy access.

IMPORTANT NOTES

- Please assure the intactness of product enclosure and all safety covers before installation. Operation must conform to the requirements of this manual and local industrial safety regulations and/or electrical codes.
- In the event of damage or loss of user manual, users may ask local distributors, offices or our Technical Service Department for a new one.
- Contents of this manual may be subject to appropriate modification as a result of product upgrade, specification change and update of the manual.
- If any item as stated in this manual is not clear, please contact our Technical Service Department.
- If any anomaly occurs after power up or during the operation, it is essential to stop the machine and identify the fault or seek technical services as soon as possible.

This manual is valid for the following model of Energy Storage Inverters:

- R3KL1-G2
- R3KL1D-G2
- R3KL1-AC
- R3KL1D-AC
- R3K6L1-G2
- R3K6L1D-G2
- R3K6L1-AC
- R3K6L1D-AC
- R4KL1-G2
- R4KL1D-G2
- R4KL1-AC
- R4KL1D-AC
- R4K6L1-G2
- R4K6L1D-G2
- R4K6L1-AC
- R4K6L1D-AC
- R5KL1-G2
- R5KL1D-G2
- R5KL1-AC
- R5KL1D-AC
- R6KL1-G2
- R6KL1D-G2
- R6KL1-AC
- R6KL1D-AC
- R8KL1-G2
- R8KL1D-G2
- R8KL1-AC
- R8KL1D-AC

It will be referred to as "inverter" hereinafter unless otherwise specified.

The inverter must only be installed by professional technicians. The professional technician is required to meet requirements as follows:

- Know electronic, electrical wiring and mechanical expertise, and be familiar with electrical and mechanical schematics.
- Be familiar with local standards and relevant safety regulations of electrical systems.
- Have received professional training related to the electrical equipment installation and commissioning.
- Be able to quickly respond to hazards or emergencies that occur during installation and commissioning.

TECHNICAL SUPPORT

Before installation, wiring, operation, and repair to the inverter, please read carefully and strictly comply with all its Safety Precautions in this manual.

Please ensure all the warning marks on the inverter are clear and distinct. Replace or add the obscure or missed warning marks.

The information from following sources is all effective.

Scan the QR codefor the latest information and services:

WhatsApp

Service time: 24/7

Users may acquire general technical data and information through MEGAREVO official website: ***http://www.megarevo.com***

If you have any question, or anything that it is not clear for you, or have some troubles during installation, wiring, and/or operation, you are suggested to contact MEGAREVO via its recommended contact information in this manual or contact its sales representatives or service engineers.

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History

Version	Release Date	Description
V1.00	Jan. 2023	First edition
V2.00	Oct. 2023	Update
V2.10	Jan. 2024	Update

1 Safety Precautions

1.1 Target Group

This manual is for qualified electricians. The tasks described in this manual only can be performed by qualified electricians.

1.2 Symbols Used

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

DANGER indicates high-risk potential hazards that, if not avoided, may lead to death or serious injury.

WARNING indicates moderate-risk potential hazards that, if not avoided, may lead to death or serious injury.

CAUTION indicates low-risk potential hazards that, if not avoided, may lead to minor or moderate injury.

NOTE provides tips that are valuable for the optimal operation of ours.

1.3 Safety Precautions

- Danger to life due to high voltages in the inverter!
- All work must be carried out by qualified electrician.
- The appliance is not to be used by children or persons with reduced physical sensory or mental capabilities, or lack of experience and
- knowledge, unless they have been given supervision or instruction.
- Children should be supervised to ensure that they do not play with the appliance.

- Danger of burn injuries due to hot enclosure parts!
- During operation, the upper lid of the enclosure and the enclosure body may become hot.
- During operation, only the touch screen needs to be operated.

- Possible health damage from radiation effects!
- Do not stay within 20cm of the inverter for a long time.

- PV modules should have an IEC61730 class A rating.
- PV modules with IEC61730 class A can be used in systems higher than DC 50V or 240W, and these systems are potentially accessible or accessible to the public.

- Ensure input DC voltage ≤Max. DC voltage. Over voltage may cause damage.
- Permanent damage to inverter or other losses, which will not be included in warranty!

- Authorized service personnel must disconnect both AC and DC power from inverter before attempting any maintenance or cleaning or working on any circuits connected to inverter.

- Do not touch anything other than the screen during operation, there is a risk of electric shock

1.3.1 Install surge protection devices (SPDs) for PV

- Please keep the user manual properly. When operating equipment, in addition to following the general precautions in this document, follow the specific safety instructions. We will not be liable for any consequence caused by the violation of the safety operation regulations and design, production, and usage standards.
- Accessories only together with the inverter shipment are recommended here. Other- wise may result in a risk of fire, electric shock, or injury to person.

- Make sure that existing wiring is in good condition and that wire is not undersized. Do not disassemble any parts of inverter which are not mentioned in installation guide. It contains no user-serviceable parts. See Warranty for instructions on obtaining service. Attempting to service the inverter yourself may result in a risk of electric shock or fire and will void your warranty.
- Keep away from flammable, explosive materials to avoid fire disaster.
- The installation place should be away from humid or corrosive substance.
- Authorized service personnel must use insulated tools when installing or working with this equipment.
- Never touch either the positive or negative pole of PV connecting device. Strictly prohibit touching both at the same time.
- The unit contains capacitors that remain charged to a potentially lethal voltage after the MAINS, battery and PV supply has been disconnected.
- Hazardous voltage will present for up to 5 minutes after disconnection from power supply.
- CAUTION-RISK of electric shock from energy stored in capacitor, never operate on the inverter couplers,the MAINS cables, Battery cables, PV cables or the PV generator when power is applied. After switching off the PV, battery, and Mains, always wait for 5minutes to let the intermediate circuit capacitors discharge before unplugging DC, battery in plug and MAINS couplers
- When accessing the internal circuit of inverter, it is very important to wait 5 minutes before operating the power circuit or demounting the electrolyte capacitors inside the device. Do not open the device beforehand since the capacitors require time sufficiently discharge!

1.3.2 Install surge protection devices (SPDs) for PV

- Over-voltage protection with surge arresters should be provided when installing PV power generation system.
- The grid connected inverter does not have SPDs installed on both PV input side and MAINS side.

- Lightning will cause a damage either from a direct strike or from surges due to a nearby strike.
- Induced surges are the most likely cause of lightning damage in majority or installations, especially in rural areas where electricity is usually provided by long overhead lines. Surge may be included on both the PV array conduction and the AC cables leading to the building.
- Specialists in lightning protection should be consulted during the end use application.
- Using appropriate external lightning protection, the effect of a direct lightning strike into a building can be mitigated in a controlled way, and the lightning current can be discharged into the ground.
- Installation of SPDs to protect the inverter against mechanical damage and excessive stress include a surge arrester in case of a building with external lightning protection system (LPS) when separation distance is kept.
- To protect the DC system, surge suppression device (SPD type2) should be fitted at the inverter end of the DC cabling and at the array located between the inverter and the PV generator, if the voltage protection level (VP) of the surge arresters is greater than 1100V,

an additional SPD type 3 required for surge protection for electrical devices.

- To protect the AC system, surge suppression devices (SPD type2) should be fitted at the main incoming point of AC supply (at the consumer's cutout), located between the inverter and the meter/ distribution system.
- All DC cables should be installed to provide as short a run as possible, and positive and negative cables of the string or main DC supply should be bundled together. Avoiding the creation of loops in the system.
- Spark gap devices are not suitable to be used in DC circuits once conducting, they won't stop conducting until the voltage across their terminals is typically more than 30 volts.

1.3.3 Anti-Islanding Effect

The islanding effect is a special phenomenon where a grid-connected PV system still delivers power to the nearby grid when voltage losses occur in the power system. This can be dangerous for maintenance personnel and the public.The inverters offer Active Frequency Drift (AFD) to prevent the islanding effect.

1.3.4 PE Connection and Leakage Current

- The end-use application shall monitor the protective conductor by residual current operated protective device (RCD) with rated fault current Ifn≤240mA which automatically disconnects the device in case of a fault. The device is intended to connect to a PV generator with a capacitance limit of about 700nf.

High leakage current!
Earth connection essential before connecting supply.

- Incorrect grounding can cause physical injury, death or equipment malfunction and increase electromagnetic.

1.3.5 Battery Safety Instructions

Energy storage inverter should be worked with low voltage battery, for the specific parameters such as battery type, nominal voltage and nominal capacity etc., please refer to section 4.

As accumulator batteries may contain potential electric shock and short-circuit current danger, to avoid accidents that might be thus resulted, the following warnings should be observed during battery replacement:

1: Do not wear watches, rings or similar metallic items.

2: Use insulated tools.

3: Put on rubber shoes and gloves.

4: Do not place metallic tools and similar metallic parts on the batteries.

5: Switch off load connected to the batteries before dismantling battery connection terminals.

6: Only personal with proper expertise can carry out the maintenance of accumulator batteries.

1.4 Explanation of Symbol

This section gives an explanation of all the symbols shown on the inverter and on the type label.

Table 1-1 Symbols on the Product

Symbol	Explanation
	CE mark. The inverter complies with requirements of applicable CE guidelines.
	Please note the provisions of the instruction manual.
	Products should not be disposed as household waste.
	Components of the product can be recycled.
	Danger of high voltage and electric shock!
	Danger of hot surface!
	Caution! Failure to observe a warning indicated in this manual may result in injury.

1.5 Maintenance Related Information

The maintenance instructions should include the following content:

- Intervals and instructions for any Preventive maintenance required to maintain safety.(For example, replacing the air filter or regularly retightening the terminals).
- Instructions for accessing the operator's access area (if present), including warning not to enter other areas of the equipment.
- Part number and instructions for obtaining any required operator replaceable parts.
- Safety and cleaning instructions (if recommended).
- If there are multiple power sources supplying PCE, information should be provided in the manual to indicate which or which disconnecting devices need to be operated to completely isolate the equipment.

1.6 Battery Maintenance

The Battery maintenance should include the following content:

- Battery maintenance should be carried out or supervised by knowledgeable personnel.
- When replacing batteries, please replace them with the same type and quantity of batteries or Battery pack.
- Do not throw the battery into the fire. The battery may explode.
- Do not open or damage the battery. The released electrolyte is harmful to the skin and eyes of the human body. It may be toxic.
- There may be a risk of electric shock and high short-circuit current in the battery.

- The following precautions should be observed when using batteries:

  01. Remove watches, rings, or other metal items.

  02. Using tools with insulated handle.

  03. Wear rubber gloves and boots.

  04. Do not place tools or metal parts on the battery.

  05. Disconnect the charging power supply before connecting or disconnecting the battery terminals.

  06. Ensure that the battery is not accidentally grounded. If accidentally grounded, please remove the power supply from the ground and contact any part of the grounded battery, which may cause electric shock.(Suitable for devices without grounded power circuits and remote battery power supplies). It can reduce the possibility of such electric shocks.

1.7 Low Voltage Earthing system

The grounding of the power system is directly related to the personal and property safety of users, as well as the normal operation of electrical and electronic equipment. According to the regulations of International Electrotechnical Commission (IEC), low-voltage distribution system is called TT system, TN system and IT system according to different grounding modes. The TN system is further divided into TN-C, TN-S, and TN-C-S systems.

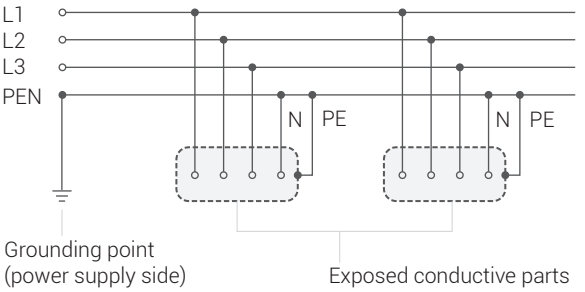
1.7.1 TN system

TN system, known as protective neutral connection. When a fault electrifies the metal casing of electrical equipment, it forms a short circuit between the phase and zero lines, resulting in low circuit resistance and

high current, which can cause the fuse to quickly fuse or the protective device to act to cut off the power supply. In the TN system, there are three types of systems: TN-C, TN-S, and TN-C-S.

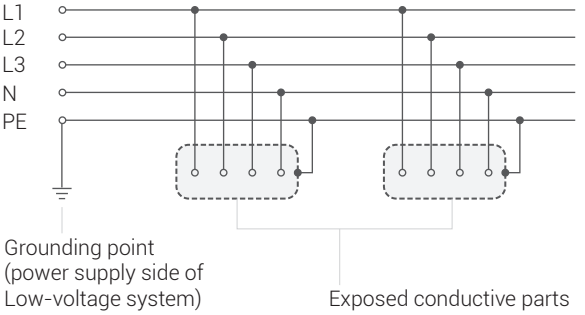
- TN-C system

The N line and PE line are integrated throughout the entire system.



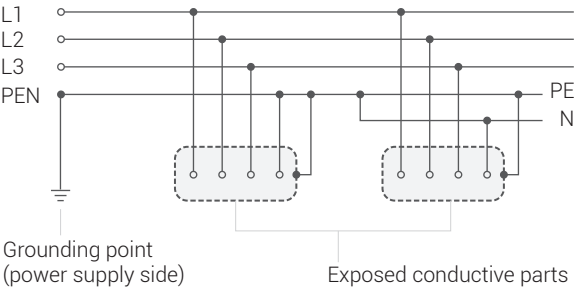
- TN-S system

The N line and PE line are separated throughout the system.



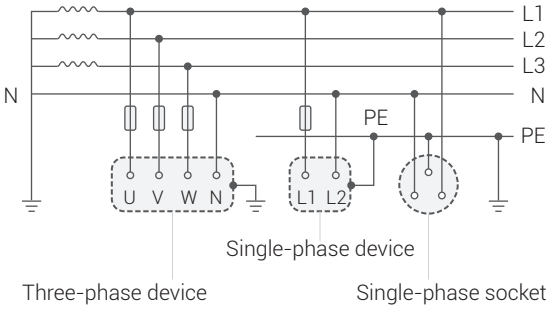
- TN-C-S system

In the whole system, N line and PE line are usually integrated only before the power incoming point of low-voltage electrical device, and they are divided into two lines after the power incoming point.



1.7.2 TT system

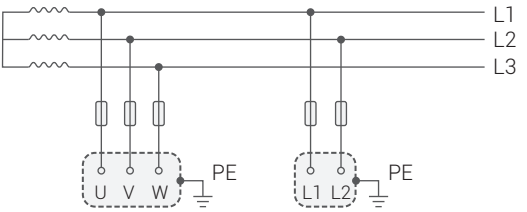
A TT system is one in which the neutral point of the power supply is directly grounded, and the exposed conductive parts of electrical equipment are also directly grounded. The grounding of the power supply's neutral point is commonly referred to as working grounding, while the grounding of the exposed conductive parts of the equipment is known as protective grounding. In the TT system, these two grounds must remain independent of each other. Equipment grounding can be achieved through each device having its own independent grounding device, or multiple devices sharing a common grounding device.



1.7.3 IT system

An IT system is a configuration in which the neutral point of the power supply is not grounded, and the exposed conductive parts of electrical

equipment are directly grounded. Although an IT system can include neutral wires, it's worth noting that the International Electrotechnical Commission (IEC) does not recommend their use. If a neutral line is introduced and a ground fault occurs at any point along the neutral line in the IT system, the system will cease to function as an IT system.

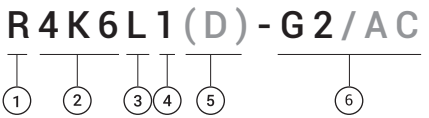


2 Introduction

2.1 Model Description

The model description is as follows (take R4K6L1(D)-G2/R4K6L1(D)-AC as an example):

Figure 2-1 Symbols on the product



R: Revo series energy storage inverters	1
4K6: output power, 4.6kW ; 5K: output power, 5kW	2
L: support low voltage batteries.(Voltage range: 40-58V)	3
1: single-phase output	4
D: with a color screen	5
G2: second generation machine ; AC: AC couple	6

2.2 Basic Features

The energy storage inverter is a high-quality inverter that can convert solar energy to AC energy and store them in the battery.

The inverter can be used to optimize self-consumption, store energy in the battery for future use, or feed it into the public grid, depending on the PV energy and user preferences. During a grid loss, the inverter can provide power for emergency use by using energy from the battery and inverter generated by PV.

Figure 2-2 System diagram: **R3KL1(D)-G2~R8KL1(D)-G2**

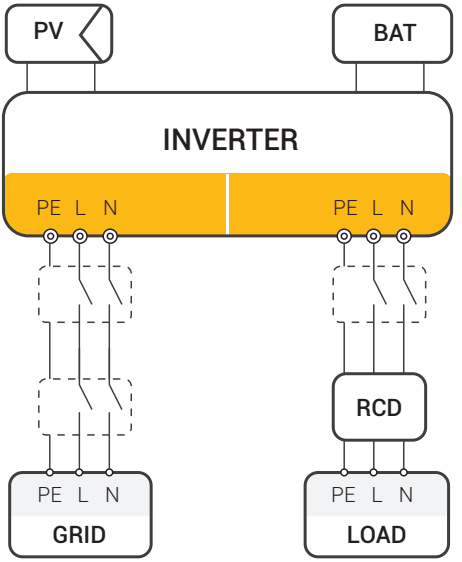
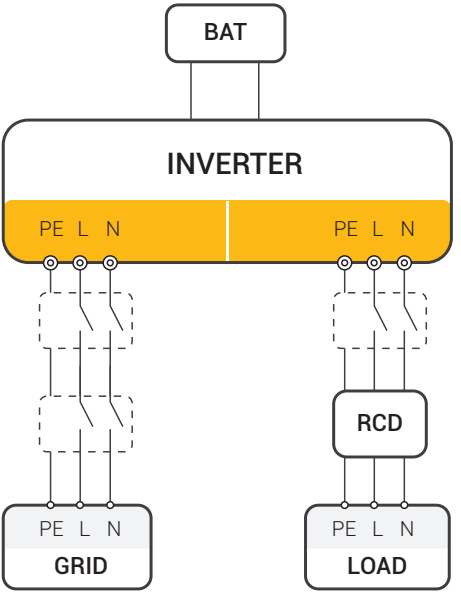


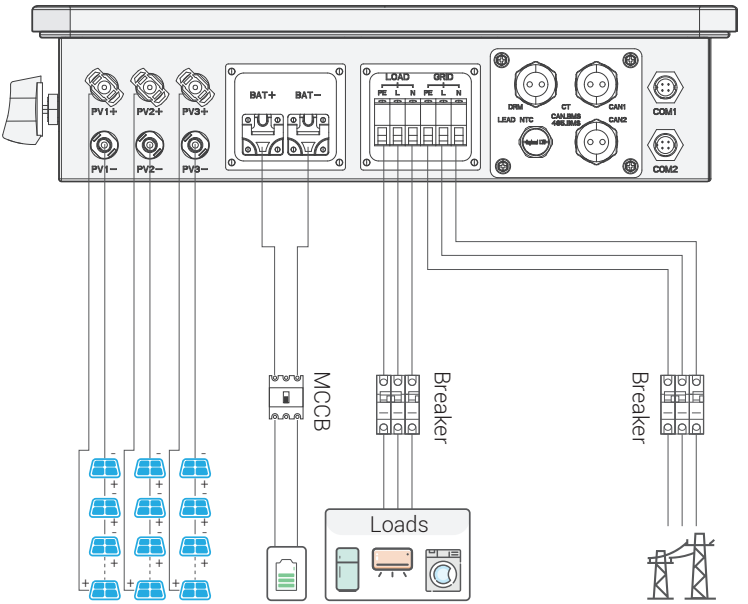
Figure 2-3 System diagram: **R3KL1(D)-AC~R8KL1(D)-AC**



All switches and RCD devices shown in the figure are for reference only, and specific installations should comply with local regulations.

- Please control the home loads and ensure that they are within the "BACK-UP output rating" under BACK-UP mode. Otherwise, the inverter will shut down with an "overload fault" warning.
- Please confirm with the mains grid operator whether there are any special regulations for grid connection.

Figure 2-4 Wiring diagram

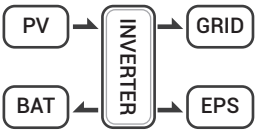


2.3 Work Modes

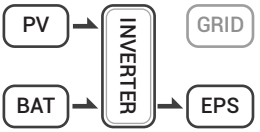
The inverter offers multiple working modes according to different requirements.

Work mode: Self Consumption

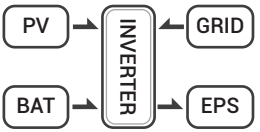
I. When PV, Grid, Battery is available:



Solar energy provides power to the loads as first priority. If the solar energy is sufficient to power all connected loads, then the surplus solar energy will charge the battery. The remaining energy will be fed into the grid.

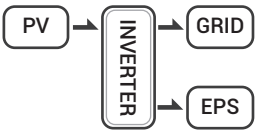


Solar energy provides power to the loads as first priority, if solar energy is not sufficient to power all connected loads, battery energy will supply power to the loads at the same time.

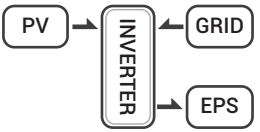


Solar energy provides power to the loads as first priority, if solar energy and battery are not sufficient to power all connected loads, utility energy (Main Grid) will supply power to the loads with solar energy at the same time.

II. When PV, Grid is available(without battery):

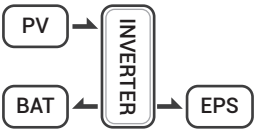


Solar energy provides power to the loads as first priority, if solar energy is sufficient, the excess power will be fed to grid.

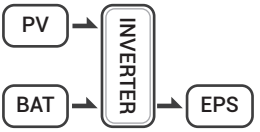


Solar energy provides power to the loads as first priority, if solar energy is not sufficient to power all connected loads, Grid energy will supply power to the loads at the same time.

III. When PV, Battery is available (Grid is disconnected):



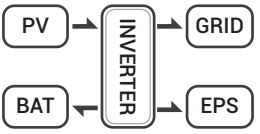
Solar energy provides power to the loads as first priority, if solar energy is sufficient to power all connected loads, solar energy will provides to charge battery.



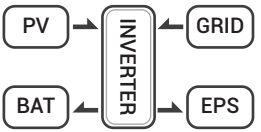
Solar energy provides power to the loads as first priority, if solar energy is not sufficient to power all connected loads, battery energy and solar energy will supply power to the loads at the same time.

Work mode: Peak Shift

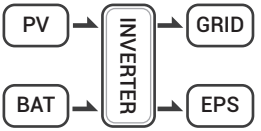
I. When PV, Grid, Battery is available:



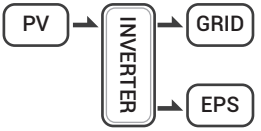
On charge time, solar energy will charge battery as first priority. The excess energy will supply power to the loads. If solar energy is sufficient to supply loads and charge battery, and If there's still some extra energy, then the excess power will feed the power to grid.



On charge time, solar energy will charge battery as first priority, then the excess solar energy will supply power to loads. If solar energy is not sufficient to charge battery and supply loads, grid will supply all the connected loads with solar energy together.

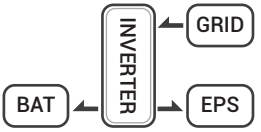


On discharge time, solar energy provides power to the loads as first priority, if solar energy is sufficient to supply loads, and if there's still some extra energy from solar energy, then the excess power and battery will deliver the power to the grid at the same time.

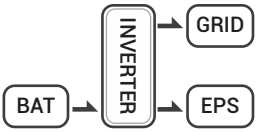


In the period of no charge or discharge, the solar power supply loads at first priority, excess energy to the grid.

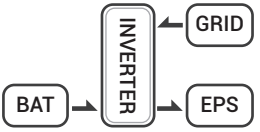
II. When Grid.Battery is available(PV is disconnected):



On charge time, grid will charge battery and supply power to the connected loads at the same time.



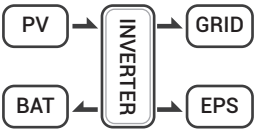
On discharge time, if load power is less than battery power, battery will supply power to loads as first priority, the excess power will be feed to grid.



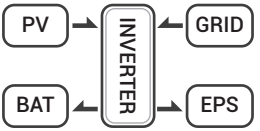
On discharge time, if load power is more than battery power, battery and grid will supply power to the loads at the same time.

Work mode: Battery Priority

I. When PV, Grid, Battery is available:

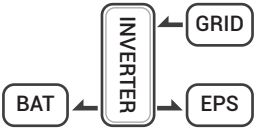


Solar energy will charge battery as first priority, if solar energy is excess, the excess power will supply load. If there's still some extra energy, then the excess power will be fed to grid.



Solar energy will charge battery as first priority, if solar energy is excess the excess power will supply load. If solar energy is not sufficient to charge battery and supply loads, grid will supply power to loads.

II. When Grid, Battery is available(PV is disconnected):



Grid will supply power to load and charge battery at the same time.

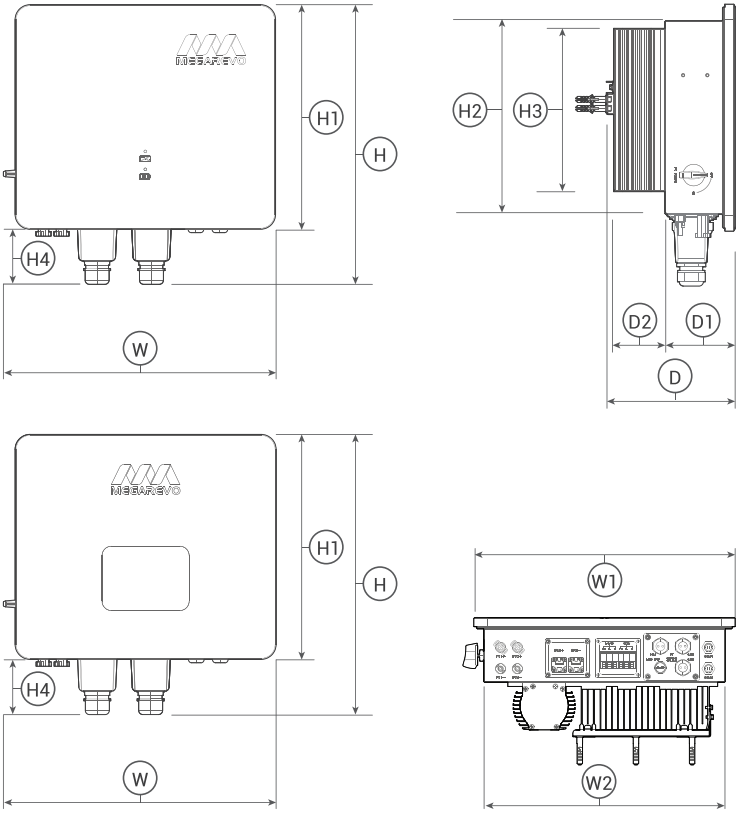
If the anti-reverse function is set to be allowable, the system will not feed power to grid in self-use, peak shift, battery priority modes.

In addition to the above three basic modes, there is also an "Advanced Mode". Please refer to Chapter 5.1.3 for details.

2.4 Dimensions

Figure 2-5 Dimensions

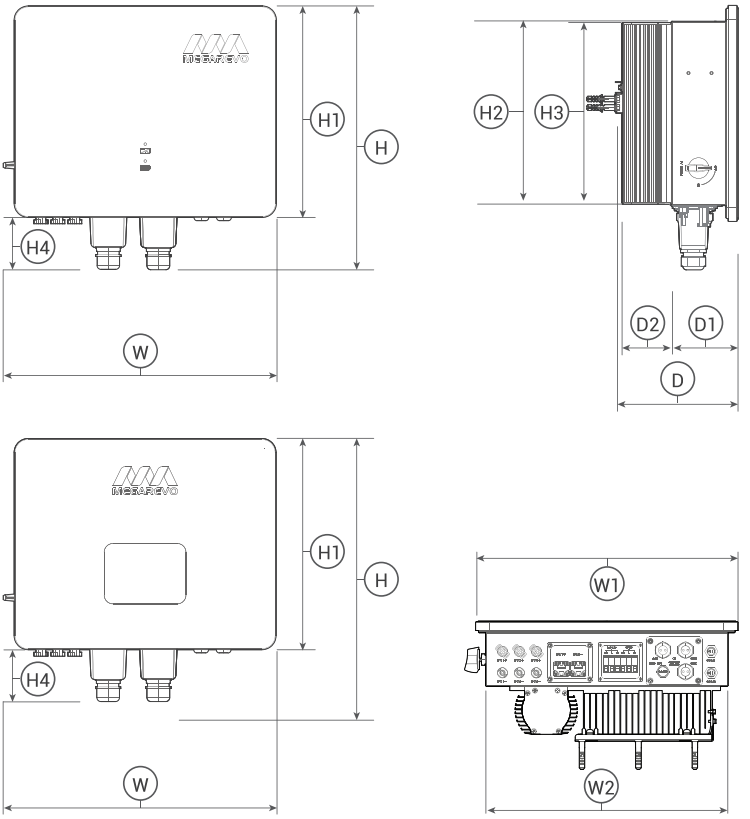
R3KL1(D)-G2/AC~ R6KL1(D)-G2/AC:



Dimensions						
W	H	D	W1	W2	H1	Mounting hole dia.
454.5	467	212	435	400	375	10
H2	H3	H4	D1	D2		
320	270	92	115	85		

Unit, mm

R8KL1(D)-G2/AC:



Dimensions						
W	H	D	W1	W2	H1	Mounting hole dia.
484.5	467	212	465	430	375	10
H2	H3	H4	D1	D2		
320	315	92	115	85		

Unit, mm

2.5 Terminals

Figure 2-6 Terminals

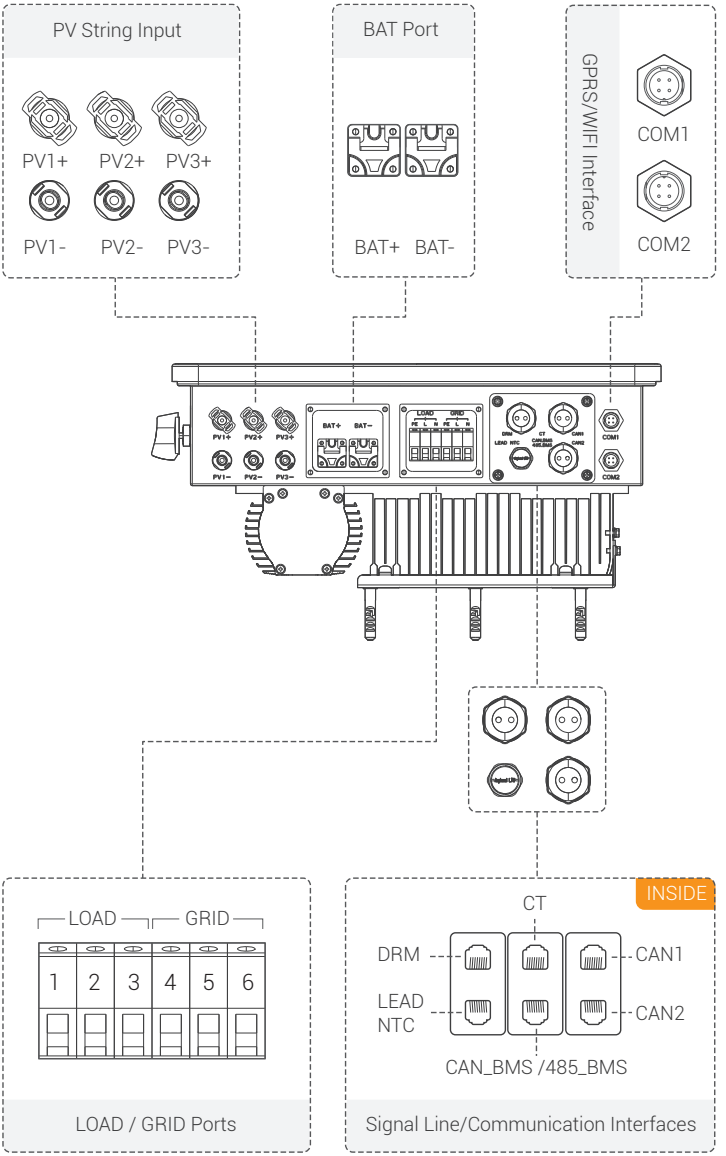


Table 2-1 Terminals

PV1+	PV string 1 positive input
PV1-	PV string 1 negative input
PV2+	PV string 2 positive input
PV2-	PV string 2 negative input
PV3+	PV string 3 positive input
PV3-	PV string 3 negative input
COM1	GPRS port or WIFI / Bluetooth port
COM2	This function is temporarily reserved
BAT+	Battery positive input
BAT-	Battery negative input
DRM	Function temporarily retained
CT	Connect to CT (current transformer)
CAN_BMS/485_BMS	BMS communication with battery
CAN1/CAN2	Communication interfaces for parallel operation
LEAD NTC	Communication interface for receiving lead-acid battery temperature. This function is temporarily reserved.

LOAD	
L	L phase
N	N phase
PE	Ground electrode
GRID	
L	Grid line L phase
N	Grid line N phase
PE	Grid line ground electrode

2.6 Parameters

Table 2-2 Parameters

PV input

Model	R3KL1(D)-G2	R3K6L1(D)-G2	R4KL1(D)-G2	R4K6L1(D)-G2
MAX. DC Input Power(kW)	4.5	5.4	6	6.9
No. of MPPT Tracker/No. of PV strings per MPPT tracker	2/1			
MPPT Range / Nominal (V)	80-500/360			
Full Power MPPT Voltage Range (V)	250-425			
MAX. DC Input Voltage(V)	550			
MAX. Input Current(A/A)	16/16			
OVC categorie	II			
MAX. Short-circuit Current(A)	18.5			

Model	R5KL1(D)-G2	R6KL1(D)-G2	R8KL1(D)-G2
MAX. DC Input Power(kW)	7.5	9	12
No. of MPPT Tracker/No. of PV strings per MPPT tracker	2/1	2/1	2/2+1
MPPT Range / Nominal (V)	80-500/360		
Full Power MPPT Voltage Range (V)	250-425		
MAX. DC Input Voltage(V)	550		
MAX. Input Current(A/A)	16/16		
OVC categorie	II		
MAX. Short-circuit Current(A)	18.5	18.5	18.5/37

Battery input

Model	R3KL1(D)-G2 R3KL1(D)-AC	R3K6L1(D)-G2 R3K6L1(D)-AC	R4KL1(D)-G2 R4KL1(D)-AC	R4K6L1(D)-G2 R4K6L1(D)-AC
Nominal voltage (Vdc)	48			
MAX.Charging/Discharging Current (A/A)	60/60	72/72	80/80	92/92

Model	R3KL1(D)-G2 R3KL1(D)-AC	R3K6L1(D)-G2 R3K6L1(D)-AC	R4KL1(D)-G2 R4KL1(D)-AC	R4K6L1(D)-G2 R4K6L1(D)-AC
MAX. Battery Output Power/ Duration (kW/min)	/			
Battery Voltage Range(V)	40-58			
Battery Type	Lithium or Lead Acid Battery			
Charging Strategy for Li-Ion Battery	Self-adaption to BMS			

Model	R5KL1(D)-G2 R5KL1(D)-AC	R6KL1(D)-G2 R6KL1(D)-AC	R8KL1(D)-G2 R8KL1(D)-AC
Nominal voltage (Vdc)	48		
MAX.Charging/Discharging Current(A/A)	100/100	120/120	160/160
MAX. Battery Output Power/ Duration (kW/min)	/	/	8/20
Battery Voltage Range(V)	40-58		
Battery Type	Lithium or Lead Acid Battery		
Charging Strategy for Li-Ion Battery	Self-adaption to BMS		

AC Output (On-Grid)

Model	R3KL1(D)-G2 R3KL1(D)-AC	R3K6L1(D)-G2 R3K6L1(D)-AC	R4KL1(D)-G2 R4KL1(D)-AC	R4K6L1(D)-G2 R4K6L1(D)-AC
Nominal output power Output to Grid (kVA/kW)	3/3	3.68/3.68	4/4	4.6/4.6
MAX. Apparent Power Output to Grid(kVA)	3.3	3.68	4.4	4.6
Output Voltage Range(Vac)	230/176~270			
Output Frequency(Hz)	50/60			
Max. AC Current Output to Grid(A)	14.3	16	19.1	20
Output Power Factor	1(0.8leading~0.8lagging)			
Output THDI	<3%			
Maximum output overcurrent protection(A)	20.5	24.5A	27.3	31.4
OVC categorie	III			
Inrush Current (A@3um)	42.9	48	57.3	60

Model	R3KL1(D)-G2 R3KL1(D)-AC	R3K6L1(D)-G2 R3K6L1(D)-AC	R4KL1(D)-G2 R4KL1(D)-AC	R4K6L1(D)-G2 R4K6L1(D)-AC
Maximum output fault current(A@3um)	42.9	48	57.3	60

Model	R5KL1(D)-G2 R5KL1(D)-AC	R6KL1(D)-G2 R6KL1(D)-AC	R8KL1(D)-G2 R8KL1(D)-AC
Nominal output power Output to Grid (kVA/kW)	5/5	6/6	8/8
MAX. Apparent Power Output to Grid(kVA)	5	6.6	8.8
Output Voltage Range(Vac)	230		
Output Frequency(Hz)	50/60		
Max. AC Current Output to Grid(A)	21.7	28.7	38.3
Output Power Factor	1(0.8leading~0.8lagging)		
Output THDI	<3%		
Maximum output overcurrent protection(A)	34.1	40.9	45.5
OVC categorie	III		
Inrush Current (A@3um)	65.1	86.1	114.9
Maximum output fault current(A@3um)	65.1	86.1	114.9

AC Output (LOAD)

Model	R3KL1(D)-G2 R3KL1(D)-AC	R3K6L1(D)-G2 R3K6L1(D)-AC	R4KL1(D)-G2 R4KL1(D)-AC	R4K6L1(D)-G2 R4K6L1(D)-AC
Rated Power(kVA/kW)	3/3	3.68/3.68	4/4	4.6/4.6
Rated Current(A)	13	16	17.4	20
Overload Capacity	110%, 60S / 120% , 30s / 150%, 10s			
Nominal Output Voltage(Vac)	230			
Nominal Output Frequency(Hz)	50/60			
Output THDU	< 2%			

Model	R5KL1(D)-G2 R5KL1(D)-AC	R6KL1(D)-G2 R6KL1(D)-AC	R8KL1(D)-G2 R8KL1(D)-AC
Rated Power(kVA/kW)	5/5	6/6	8/8
Rated Current(A)	21.7	26	35

Model	R5KL1(D)-G2 R5KL1(D)-AC	R6KL1(D)-G2 R6KL1(D)-AC	R8KL1(D)-G2 R8KL1(D)-AC
Overload Capacity	110%, 60S / 120% , 30s / 150%, 10s		
Nominal Output Voltage(Vac)	230		
Nominal Output Frequency(Hz)	50/60		
Output THDU	< 2%		

Efficiency

Model	R3KL1(D)-G2 R3KL1(D)-AC	R3K6L1(D)-G2 R3K6L1(D)-AC	R4KL1(D)-G2 R4KL1(D)-AC	R4K6L1(D)-G2 R4K6L1(D)-AC
Battery Charge / Discharge	96%			
DC Max. Efficiency	98.0%			
MPPT Efficiency	99.9%			

Model	R5KL1(D)-G2 R5KL1(D)-AC	R6KL1(D)-G2 R6KL1(D)-AC	R8KL1(D)-G2 R8KL1(D)-AC
Battery Charge / Discharge	96%		
DC Max. Efficiency	98.0%		
MPPT Efficiency	99.9%		

Protection

Model	R3KL1(D)-G2 R3KL1(D)-AC	R3K6L1(D)-G2 R3K6L1(D)-AC	R4KL1(D)-G2 R4KL1(D)-AC	R4K6L1(D)-G2 R4K6L1(D)-AC
Island Protection	√	√	√	√
Insulation Resistor Detection	√	√	√	√
Residual Current Monitoring Unit	√	√	√	√
Output Over Current Protection	√	√	√	√
Back-up Output Short Protection	√	√	√	√
Output Over Voltage Protection	√	√	√	√
Output Under Voltage Protection	√	√	√	√

Model	R5KL1(D)-G2 R5KL1(D)-AC	R6KL1(D)-G2 R6KL1(D)-AC	R8KL1(D)-G2 R8KL1(D)-AC
Island Protection	√	√	√
Insulation Resistor Detection	√	√	√
Residual Current Monitoring Unit	√	√	√
Output Over Current Protection	√	√	√
Back-up Output Short Protection	√	√	√
Output Over Voltage Protection	√	√	√
Output Under Voltage Protection	√	√	√

General

Model	R3KL1(D)-G2 R3KL1(D)-AC	R3K6L1(D)-G2 R3K6L1(D)-AC	R4KL1(D)-G2 R4KL1(D)-AC	R4K6L1(D)-G2 R4K6L1(D)-AC
Grid and off grid switching time (ms)	10			
Operating Temperature Range(℃)	-25 ~ +60			
Relative Humidity	0-95%			
Operating Altitude	No derating below 2000m			
Ingress Protection	IP65			
Weight(kg)	19			
Size (W×H×D, mm)	454.5× 467 × 200			
Cooling	Natural convection			
Noise emission(dB)	<35			
Display	Color screen			
Communication With RS485/ Wifi/GPRS/CAN/DRM	√ / optional / optional / √ / √			
Standby loss(W)	< 15 W			

Model	R3KL1(D)-G2 R3KL1(D)-AC	R3K6L1(D)-G2 R3K6L1(D)-AC	R4KL1(D)-G2 R4KL1(D)-AC	R4K6L1(D)-G2 R4K6L1(D)-AC
Certificates	IEC/EN 62109-1/-2, IEC/EN61000-6-1/-6-3, VDE-AR-N 4105:2018/DIN VDE V 0124-100:2020, NRS 097-2-1:2017, EN50549-1, EN50549-1/Rfg:2016/NC Rfg:2018/PTPiREE:2021, EN50549-1+EN50438, EN50549-1(France), CEI 0-21:2022, C10/11			
Pollution degree	II			
Topology	Non-isolated			

Model	R5KL1(D)-G2 R5KL1(D)-AC	R6KL1(D)-G2 R6KL1(D)-AC	R8KL1(D)-G2 R8KL1(D)-AC
Grid and off grid switching time (ms)	10		
Operating Temperature Range(°C)	-25 ~ +60		
Relative Humidity	0-95%		
Operating Altitude	No derating below 2000m		
Ingress Protection	IP65		
Weight(kg)	19	19	22
Size (W×H×D, mm)	454.5×467×200	454.5×467×200	484.5× 467 × 200
Cooling	Natural convection		
Noise emission(dB)	<35		
Display	Color screen		
Communication With RS485/ Wifi/GPRS/CAN/DRM	√ / optional / optional / √ / √		
Standby loss(W)	< 15 W		

Model	R5KL1(D)-G2 R5KL1(D)-AC	R6KL1(D)-G2 R6KL1(D)-AC	R8KL1(D)-G2 R8KL1(D)-AC
Certificates	IEC/EN 62109-1/-2, IEC/EN61000-6-1/-6-3, VDE-AR-N 4105:2018/DIN VDE V 0124-100:2020, NRS 097-2-1:2017, EN50549-1, EN50549-1/Rfg:2016/NC Rfg:2018/PTPiREE:2021, EN50549-1+EN50438, EN50549-1(France), CEI 0-21:2022, C10/11		
Pollution degree	II		
Topology	Non-isolated		

3 Installation

3.1 Check for Physical Damage

Make sure that the inverter is intact during shipment. If there is any visible damage, such as cracks, please contact your dealer immediately.

3.2 Packing List

Open the package and take out the product, please check the accessories first. The package list is shown below.

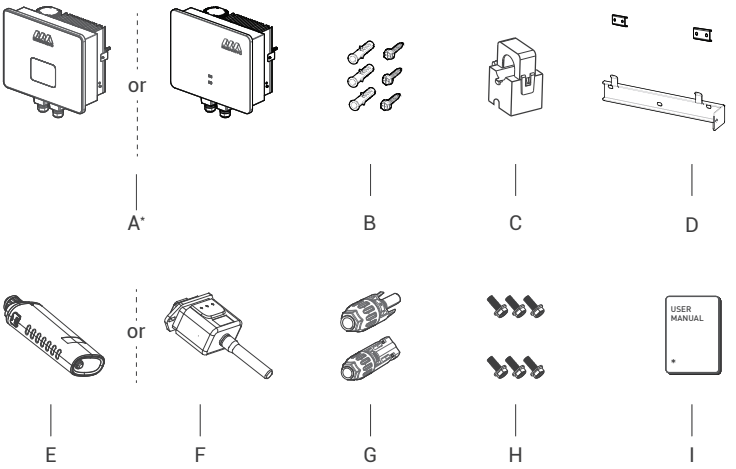


Table 2-4 Parts list

No.	Description	No.	Description
A*	Inverter	E	GPRS module (optional)
B	Expansion pipes & self-tapping screws	F	WIFI module (optional)
C	Current transformer(CT)	G	PV connectors
D	Hanging rack	H	Hexagon head bolts
I	User manual		
*: With touch screen (left) /without touch screen (right)			

3.3 Mounting

3.3.1 Installation Precaution

The inverter is designed for outdoor installation (IP 65). Please ensure that the installation location meets the following conditions:

- Not in direct sunlight.
- Not in areas where highly flammable materials are stored.
- Not in potential explosive areas.
- Not in the cool air directly.
- Not near the television antennas or antenna cables.
- Not higher than altitude of about 2000m above sea level.
- Not in environment of precipitation or humidity (>95%).
- Under good ventilation conditions.
- The ambient temperature is between -25℃ and +60℃ .
- The slope of the wall should be within ± 5°.
- The wall hanging the inverter should meet the following conditions:
    i. Solid brick/concrete, or a mounting surface of comparable strength;
    ii. Inverter must be supported or reinforced if the wall's strength isn't enough (such as wooden wall, the wall covered by a thick decorative layer)

Please **AVOIDE** direct sunlight, rain exposure, snow accumulation during installation and operation.

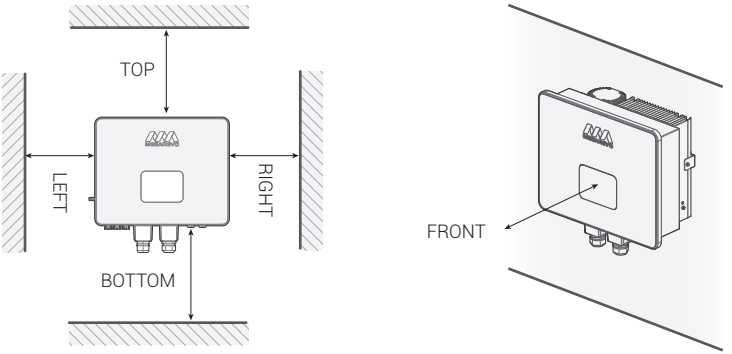
No direct sunlight

No rain exposure

No snow accumulation

3.3.2 Space Requirement

Figure 3-1 Space requirement

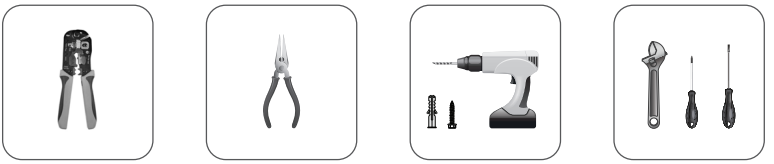


Directions	TOP	BOTTOM	LEFT	RIGHT	FRONT
Min. size (mm)	500	500	300	300	1000

3.3.3 Installation Procedure

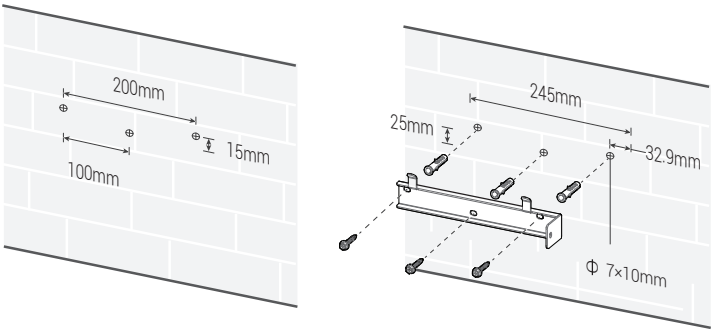
Tools:

Terminal blocks, RJ45 crimping pliers, screwdrivers, hand wrenches and drills, etc.



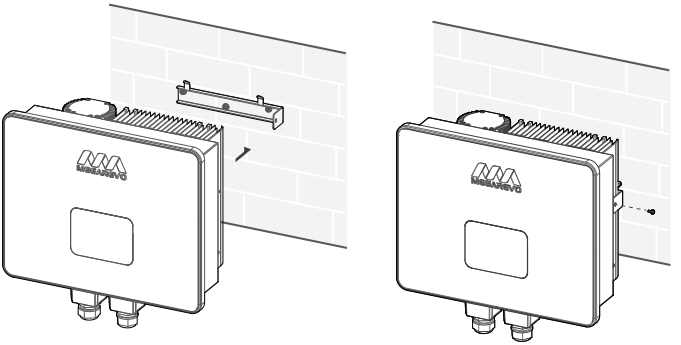
Step 1: Mounting the hanging rack on the wall

1. Place the hanging rack on the wall, mark the location of the 3 holes and then remove it.
2. Drill holes with an drill, making sure they are deep enough (about 50~60 mm) to support the inverter.
3. Then install the expansion pipes into the hole with a proper hammer, and fix the hanging rack with self-tapping screws.

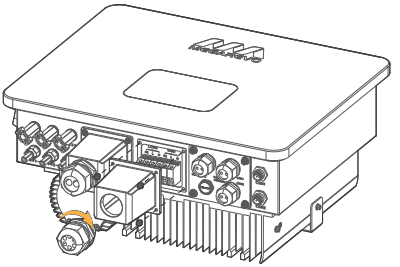


Step 2: Lift the inverter and fix the inverter to the wall by aligning the hole of the inverter with the expansion bolt.

Step 3: Tighten the fixing screws on the right side of the inverter.



Step 4: Use a screwdriver to remove the waterproof box under the lower part of the machine.



Step 5: After installation, to ensure that the machine does not fall off, please double check if the machine is fixed to the rack.

The installation steps for the non-touchscreen model are the same as those for the touchscreen model.

Note: Nothing should be stored on or placed against the inverter.

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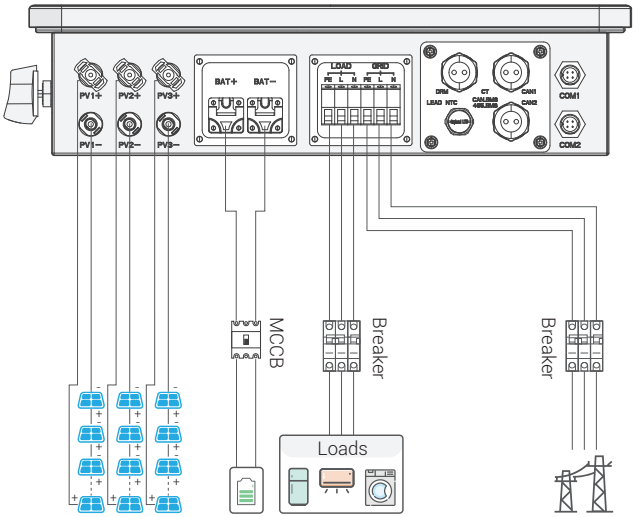
4 Electrical Connection

Electrical wiring diagram without generator

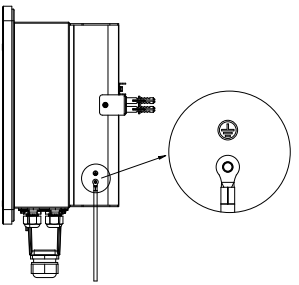


4.1 PE Cable Installation

An external ground connection is provided at the right side of inverter.

Prepare OT terminals: M4. Use proper tooling to crimp the lug to the terminal.Cable Size: 8AWG.

Connect the OT terminal with ground cable to the right side of inverter. The torque is 2Nm.



4.2 PV Input Cable Installation

Energy storage inverters can be connected in series with 2/3-strings PV modules for 3kW, 3.6kW, 4kW, 4.6kW, 5kW, 6kW, 8kW.
Select PV modules with excellent function and reliable quality. The open-circuit voltage of module arrays connected in series should be less than Max. DC input voltage. Operating voltage should be in accordance with MPPT voltage range.

Table 4-1 Max. DC Voltage Limitation

Item	Value
Max. DC Voltage (V)	550
MPPT Voltage Range (V)	80~500/360

- PV module voltage is very high, which already achieve dangerous voltage range, please comply with electric safety rules when connecting.
- **DO NOT** ground the PV positive and negative terminals.

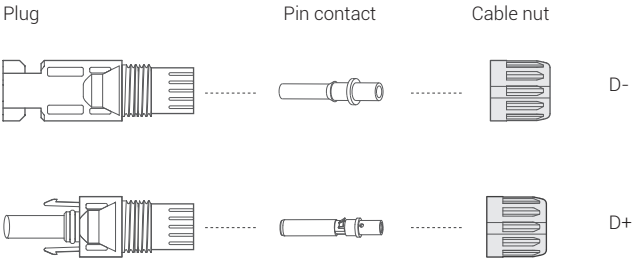
- The following requirements of PV modules need to be applied for each input area.In order to save cable and reduce the DC loss, we suggest to install the inverter near PV modules.

Connection steps:

Step 1 : Inspect PV modules

1. Measure the module array voltage with a voltmeter.
2. Check the PV+ and PV- from the PV string combiner box correctly.
3. Please make sure the impedance between the positive pole and negative pole of PV to ground should be MΩ level.

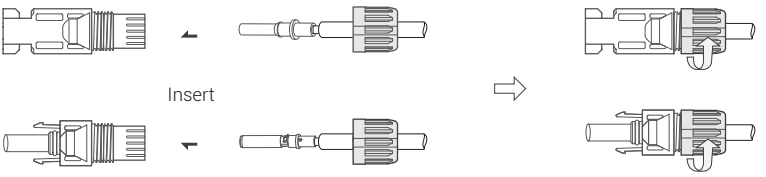
Step 2: Separate DC Connector



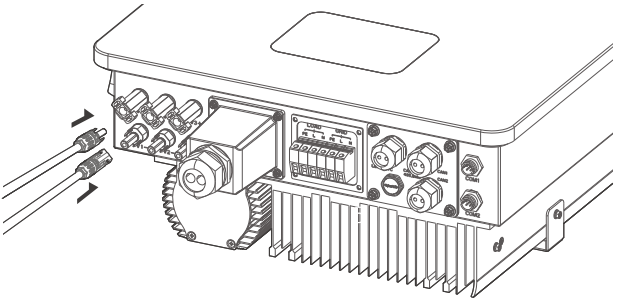
Step 3 : Wiring

1. Connect the 10 AWG wire to the cold crimp terminal.
2. Remove 10mm of insulation from the end of the wire.
3. Insert the stripped end into the pin contact and clamp it with crimping pliers.

Step 4 : Insert the pin contact through the nut and into the male or female plug, when a "click" is felt or heard, the pin contact assembly is properly seated. Then tighten the nut.



Step5 : Plug the PV connector into the corresponding interface on the inverter.



- **Caution!**
- Danger of burn injuries due to hot enclosure parts! If DC inputs are accidently reversely connected or inverter is faulty or not working properly, it is NOT allowed to turn off the DC switch. Otherwise it may cause DC arc and damage the inverter or even lead to a fire disaster. The correct actions are:
- Use a clip-on ammeter to measure the DC string current.

- **Caution!**
- If it is above 0.5A, please wait for the solar irradiance reduces until the current decreases to below 0.5A.
- Only after the current is below 0.5A, you are allowed to turn off the DC switches and disconnect the PV strings.
- In order to completely eliminate the possibility of failure, please disconnect the PV strings after turning off the DC switch to aviod secondary failures due to continuous PV energy on the next day. Please note that any damages due to wrong operations are not covered in the device warranty.

4.3 AC Cable Installation (on grid)

Step1 : Check the grid voltage

- Check the grid voltage and compare it with the allowed voltage range (refer to the technical data).
- Disconnect the board from all phases and ensure that it is not reconnected.

Step2 : Select the appropriate cable and cable lug.

Table 4-2 Recommended cables - GRID

Model	R3KL1(D)-G2/AC	R3K6L1(D)-G2/AC~ R5KL1(D)-G2/AC
Cable (AWG)	12	10

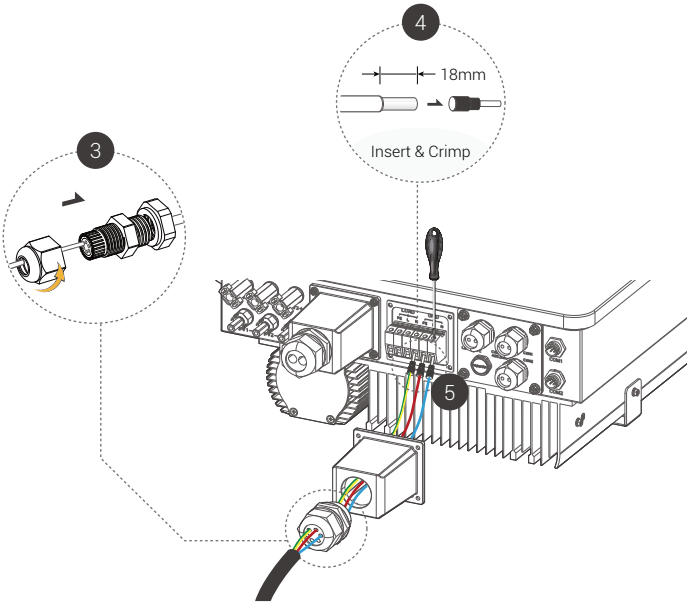
Model	R6KL1(D)-G2/AC~R8KL1(D)-G2/AC
Cable (AWG)	8

Step3 : Disassemble the waterproof connector and waterproof cover, and thread the cable through the waterproof connector.

Step4: Wiring

1. Connect the wire to the cold crimp terminal.
2. Remove 18mm of insulation from the end of the wire.
3. Insert the stripped end into the cable lug and clamp it with crimping pliers.

Step 5 : Insert the terminals into grid ports (loosen or tighten the crimp terminal screws with a one-way screwdriver).



4.4 AC Cable Installation (back-up)

The inverter has both on-grid and off-grid functions. When the grid is on, the inverter delivers output power through the AC port. When the grid is off, it delivers output power through the backup port.

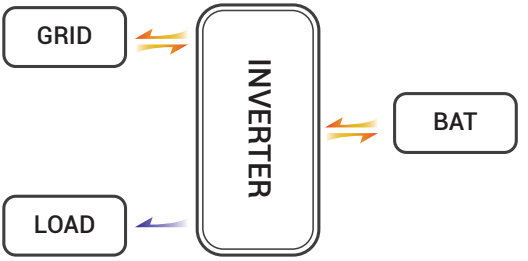
Auto & Manual:

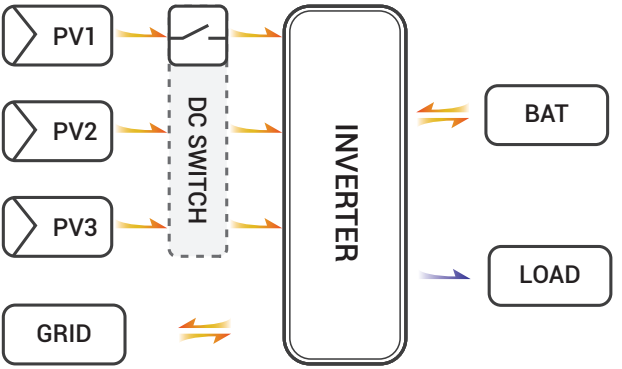
The BACK-UP function can be activated automatically or manually according to the user's preference.

Load port:

When the battery power is insufficient, the load connected to this interface will power down.

- In a standard PV installation for an inverter, it typically involves connecting the inverter to both solar panels and batteries. The Back-Up function is not recommended for use in systems that are not connected to batteries. Failure to follow this instruction will void the standard warranty, and the user will be held liable for any related consequences.
- Energy storage inverters can provide an overload output in Back-Up mode. Refer to the technical parameters of the inverter for details. The inverter is equipped with self-protection against high ambient temperatures.
- For complex applications or special loads, please contact our after-sales support.





If there are any discrepancies between the local policy's wiring mode and the operation guide given above, particularly regarding the wiring of the neutral line, grounding, and RCD, please contact us before conducting any operations.

To ensure safety when using the off-grid function, please add an off-grid AC breaker to the off-grid output cable.

Table 4-3 Recommended breakers

Model	R3KL1(D)-G2/AC	R3K6L1(D)-G2/AC	R4KL1(D)-G2/AC
Micro breaker(A)	19.5	23.5	26
Model	**R4K6L1(D)-G2/AC**	**R5KL1(D)-G2/AC**	**R6KL1(D)-G2/AC**
Micro breaker(A)	30	32.6	39
Model	**R8KL1(D)-G2/AC**		
Micro breaker(A)	43.5		

The absence of an AC breaker on the back-up side may result in inverter damage in case of an electrical short circuit.

Step1: Select the appropriate cable and wire connector

Table 4-4 Recommended cables - LOAD

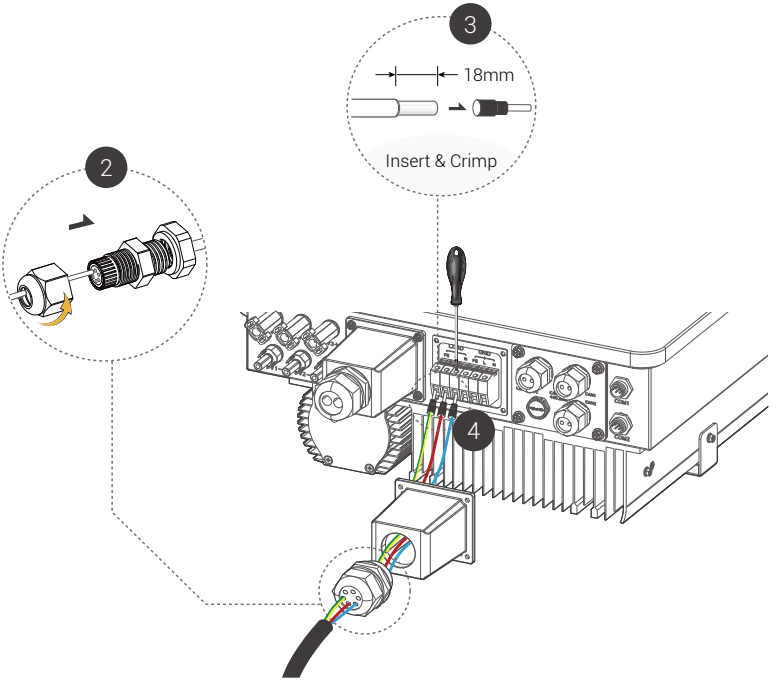
Model	R3KL1(D)-G2/AC	R3K6L1(D)-G2/AC	R4KL1(D)-G2/AC
Cable(AWG)	≥11	≥10	≥10
Model	**R4K6L1(D)-G2/AC**	**R5KL1(D)-G2/AC**	**R6KL1(D)-G2/AC**
Cable(AWG)	≥9	≥9	≥8
Model	**R8KL1(D)-G2/AC**		
Cable(AWG)	≥8		

Step2 : Disassemble the waterproof connector and waterproof cover, and thread the cable through the waterproof connector.

Step3: Wiring

1. Connect the wire to the cold crimp terminal.
2. Remove 18mm of insulation from the end of the wire.
3. Insert the stripped end into the cable lug and clamp it with crimping pliers.

Step 4 : Insert the terminals into load ports (loosen or tighten the crimp terminal screws with a one-way screwdriver).



Requirements for BACK-UP loads

Make sure the BACK-UP load power rating is within BACK-UP output rating, otherwise the inverter will shut down with an"over load" warning.

When an "over load" is appeared, adjust the load power to make sure it is within the BACK-UP output power range, then turn the inverter back on.

For the nonlinear load, please make sure the inrush power should be within the BACK- UP output power range.

4.5 Battery Cable Installation

The charge/discharge system of energy storage inverters is designed for 48V lithium batteries.
Before selecting a battery, please note that the battery communication should be compatible with the energy storage inverter.

Battery breaker

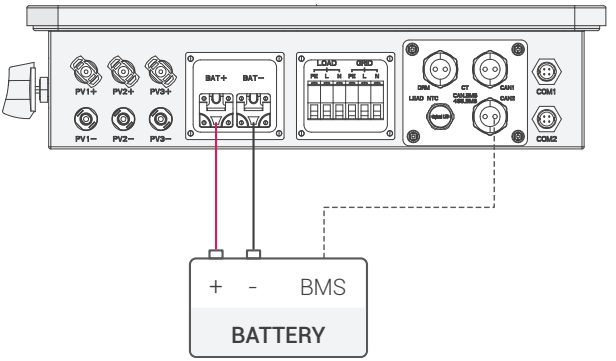
Before connecting to the battery, install a non-polarized DC circuit breaker to ensure that the inverter can be safely disconnected during maintenance.

Table 4-5 Recommended non-polar DC breaker-breaker

Model	R3KL1(D)-G2/AC	R3K6L1(D)-G2/AC	R4KL1(D)-G2/AC
Current (A)	60	72	80
Model	**R4K6L1(D)-G2/AC**	**R5KL1(D)-G2/AC**	**R6KL1(D)-G2/AC**
Current (A)	92	100	120
Model	**R8KL1(D)-G2/AC**		
Current (A)	160		

Battery connection diagram

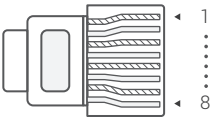
Figure 4-1 Battery connection



BMS PIN Defination

The communication interface between the inverter and the battery is RJ45, and its protocol is RS485 or CAN.

Figure 4-2 BMS PIN definition



PIN	1	2	3	4	5	6	7	8
RS485	×	×	×	×	×	GND	BMS_485A	BMS_485B
CAN	×	×	×	BMS_CANH	BMS_CANL	×	×	×

The battery communication can only work when the battery BMS is compatible with the inverter.

Battery connection steps:

Step1: Select the appropriate cable and O-terminal with an M6 bore.

Table 4-6 Recommended cables - Battery

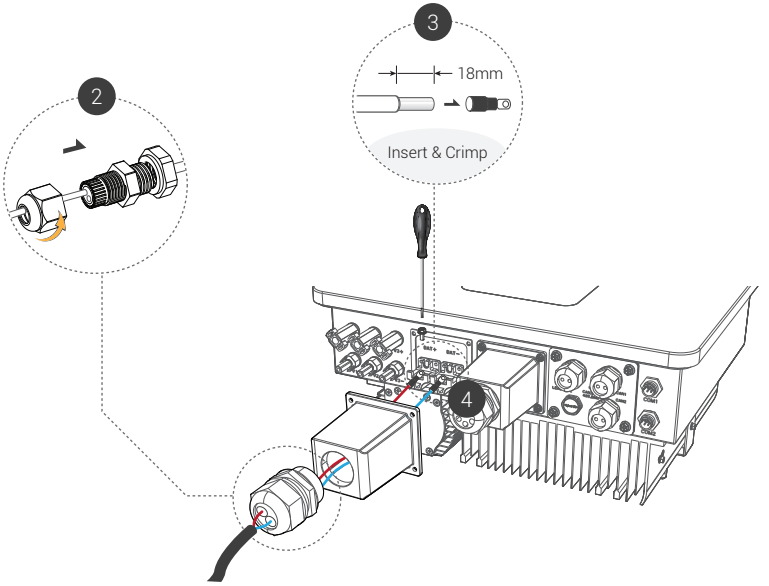
Model	R3KL1(D)-G2/AC	R3K6L1(D)-G2/AC	R4KL1(D)-G2/AC
Cable(AWG)	≥5	≥5	≥4
Model	**R4K6L1(D)-G2/AC**	**R5KL1(D)-G2/AC**	**R6KL1(D)-G2/AC**
Cable(AWG)	≥4	≥3	≥3
Model	**R8KL1(D)-G2/AC**		
Cable(AWG)	≥2		

Step2 : Disassemble the waterproof connector and waterproof cover, and thread the cable through the waterproof connector.

Step3: Wiring

1. Connect the wire to the cold crimp terminal.
2. Remove 18mm of insulation from the end of the wire.
3. Insert the stripped end into the O-terminal with an M4 bore and clamp it with crimping pliers.

Step 4 : Insert the terminals into battery ports (loosen or tighten the crimp terminal screws with a one-way screwdriver).



Note: Positive and negative lines are not allowed to reverse.

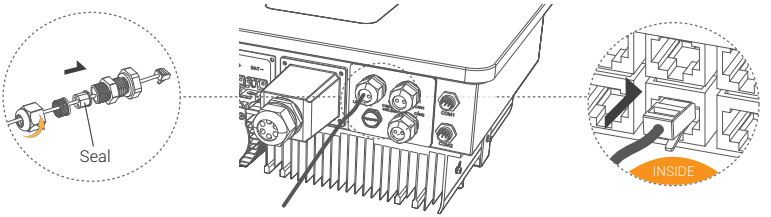
BMS connection steps:

Step 1: Disassembly of waterproof connector and waterproof cover.

Step 2: Prepare a communication cable (without sheath) and pass the cable through the waterproof connector.

Step 3: Insert the RJ45 connector into the BMS port of the inverter.

Step 4: Assemble waterproof connectors and waterproof cover.



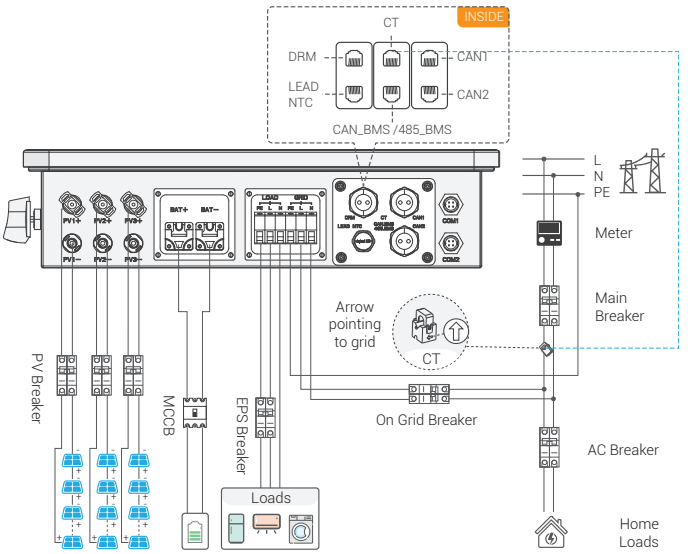
The seal is for waterproofing. Please make sure it is put back in.

4.6 CT Installation instructions

CT stands for "current transformer" and is used to detect grid current.

- If CT is not installed or installed incorrectly, the "Anti-reflux", "Self-use", "Peak-shift" functions will not be realized.
- The direction of the arrow on the CT should point from this inverter to the GRID!
- When connected to a single-phase power grid (Europe, Africa, Asia, Australia), only one CT is provided in the accessories. The RJ45 connector of the CT is connected to "CT-L1", and the CT is connected to the L phase.
- When connected to a split-phase power grid (North America), the accessories provide two CTs.

Figure 4-3 CT connection and phase wiring diagram



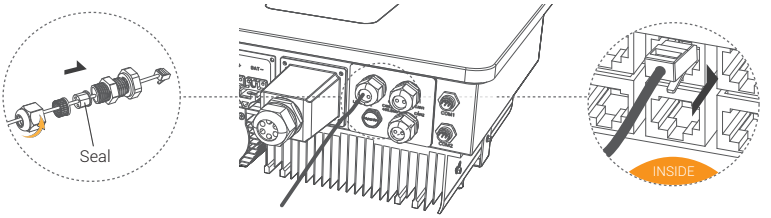
CT connection steps:

Step 1: Disassembly of waterproof connector and waterproof cover.

Step 2: Prepare a communication cable (without sheath) and pass the cable through the waterproof connector.

Step 3: Insert the RJ45 connector into the CT port of the inverter.

Step 4: Assemble waterproof connectors and waterproof cover.



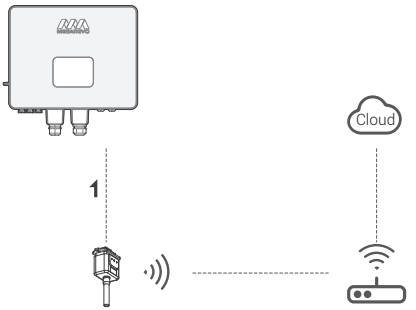
The seal is for waterproofing. Please make sure it is put back in.

4.7 WiFi Connection (optional)

The inverter provides a WIFI port that allows data to be collected from the inverter and transmitted to a monitoring website via WIFI.

Purchase this WIFI adaptor from the supplier if needed.

Figure 4-4 WIFI connection diagram

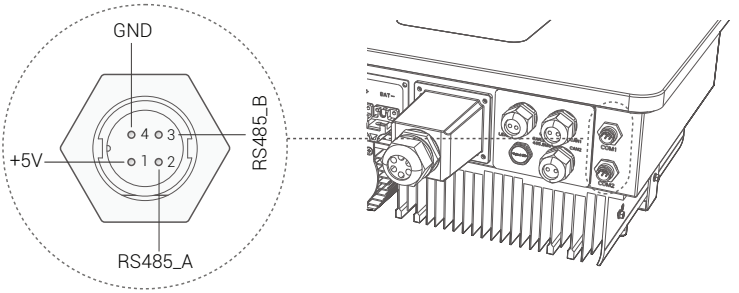


WIFI connection steps:

Step 1: Assemble WIFI adaptor to COM1 port at the bottom of the inverter.

Step 2: Establish the connection between the inverter and the router.

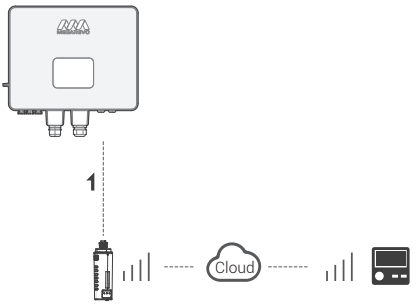
Step 3: Create a user account online. (Please check the " WIFI adaptor user manual" for more details).



4.8 GPRS Connection (optional)

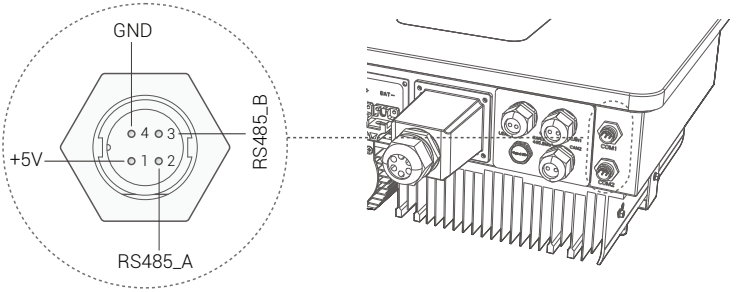
The inverter provides a GPRS (radio frequency) port to control the switching time of a given load via a smart plug (which can be purchased from the supplier if required), thus allowing the load to consume mainly PV energy during operation and minimizing energy costs.

Figure 4-5 GPRS connection diagram



GPRS connection steps:

Please refer to the " Smart Plug user manual" for detailed connection steps.

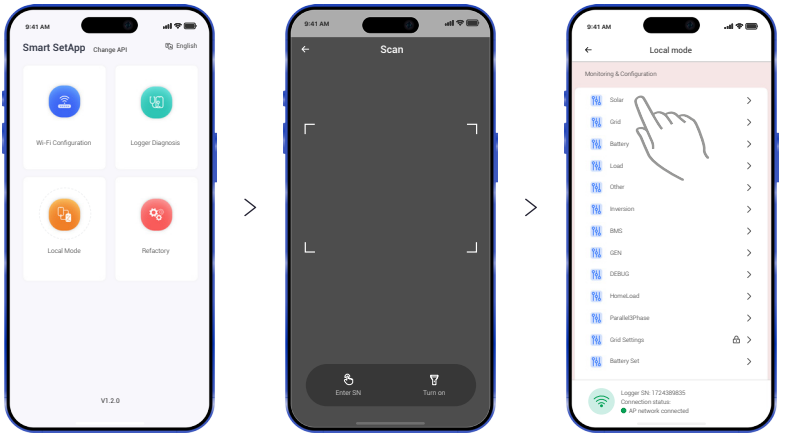


4.9 Bluetooth Connection (optional)

If you need to set a mode or check the device status, you can connect locally via Bluetooth.

The inverter provides a WiFi (including Bluetooth) port that can collect data from the inverter and transmit it to a mobile terminal via Bluetooth.

- **Step 1:** Plug the WiFi into the COM1 port at the bottom of the inverter.
- **Step 2:** Turn on the Bluetooth of the mobile terminal to search for a pairing connection.
- **Step 3:** Open the SmartSET app on the mobile terminal.
- **Step 4:** Click on the local mode, enter the SN code by scanning or manually inputting the SN code.



4.10 Inverter System Guide

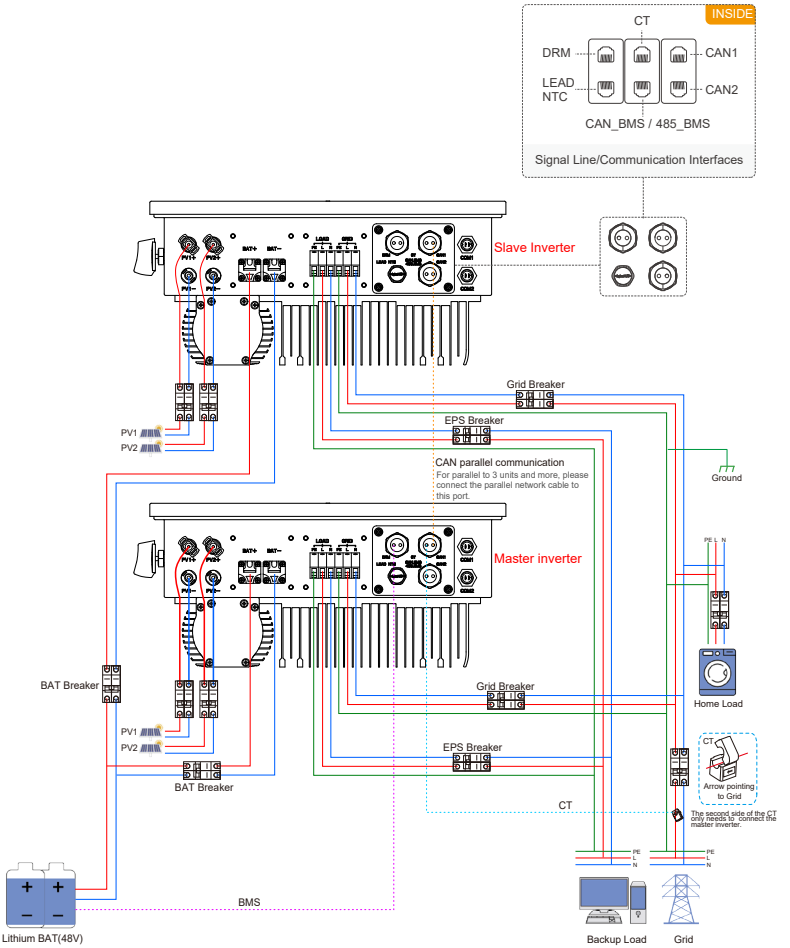
4.10.1 Parallel System Diagram

Multiple inverters can be installed together to deliver more power. When AC loads are present, all units effectively share the load. The system diagram is as follows.

If using Common CT connection Method, Please contact your dealer to purchase a larger capacity CT to ensure sampling accuracy.

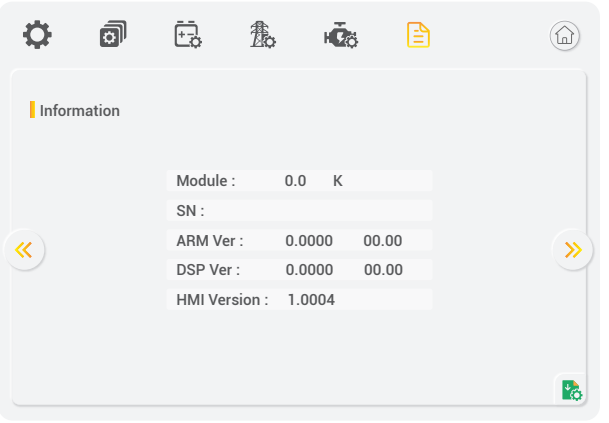
- 1.The BMS port: BMS communication for lithium batteries.
- 2.The CT port: For external grid side CT to detect current size.
- 3.CAN port: parallel port.
- 4.LEAD_NTC: Used for communication of battery temperature.

For parallel communication, CAT 6 cables are needed. The units should be connected hand by hand. When using common batteries, BMS cable needs to be connected to the master unit. THE inverter shares the BMS information by inter -unit parallel communication cable. For details about how to configure the parallel system, see 5.1.3 Setting Options (1).



4.10.2 Parallel precautions for use

1.Make sure all the units in parallel are with the same software version.



2.Connect the loads of the two inverters together first. It should be noted that the grid power line and the load line of the two inverters should be roughly the same length.If user wants to add grid /load ac breaker, please make sure the lines are paralleled/jointed before connected to breaker.

3.Make sure the CT Limiter sensor is installed properly .

4.Please note that the slaver unit will be in the same work mode automatically as the master unit.

5.Only the parallel connection of shared batteries is supported. The BMS communication must be connected to the host.

6.The photovoltaic input source is independent, and the grid is shared.

4.10.3 Inverter Configuration

Start inverter after checking all the following:

- Ensure all the devices are accessible for operation, maintenance and service.
- Check and confirm that the inverter is firmly installed.
- Space for ventilation is sufficient for one inverter or multiple inverters.
- Nothing is left on the top of the inverter or battery module.
- Inverter and accessories are correctly connected.
- Cables are routed in safe place or protected against mechanical damage.
- Warning signs and labels are suitably affixed and durable.
- Switch on the external AC breaker to power on the inverter control board.
- Measure DC voltage of PV strings and battery and ensure the polarity is correct.
- Measure AC voltage and frequency and ensure they are within local standard.

Starting inverter:

- Inverter will start automatically when the PV panel generate enough energy or the battery is charged.
- Check the status of LCD screen, the LCD screen should display the main interface.
- If the LCD screen reports a fault or alarm, please check the below:

-All the connections are right.

-All the external disconnect switches are closed.

-The DC switch of the inverter is in the ' ON ' position.

- Enter the setting interface.

Shut down inverter:

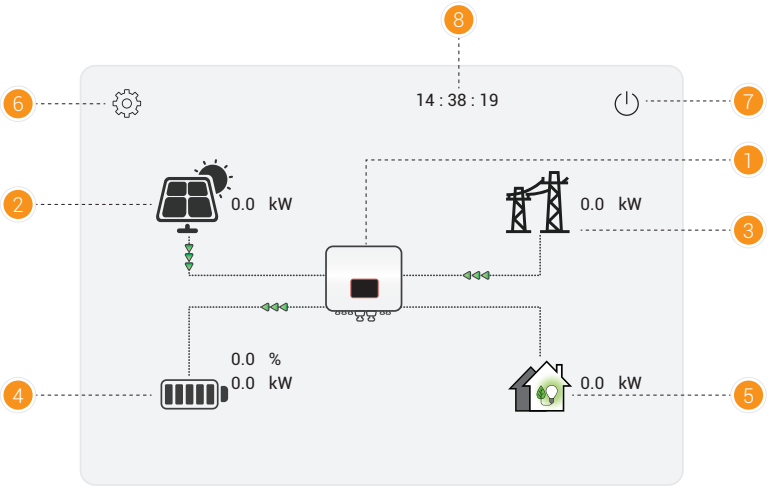
- Disconnect the external AC circuit breaker and secure it against reconnection.
- Rotate the DC switch to the "OFF" position for disconnecting all of the PV string inputs.
- Wait about 10 minutes until the capacitors inside the inverter completely discharge.
- Ensure that the DC cable is current-free via a current clamp.

5 Operation

5.1 LCD Operation

5.1.1 Home page

Figure 5-1 Homepage



1 **Energy storage inverter**

Click to enter the working status interface of the energy storage inverter, refer to section 5.1.2 (1) for more details.

2 **PV**

Display real-time solar power.

Click to enter the solar working status interface. Refer to section 5.1.2 (2) for more details.

3 **Grid**

Display the real-time grid power.

Click to enter the working status interface of grid. Refer to section

5.1.2 (3) for more details.

4 **Battery**

Display the real-time battery power and the percentage of remaining battery capacity.

Click to enter the working status interface of battery, Refer to section 5.1.2 (4) for more details.

5 **Load**

Display the real-time load power.

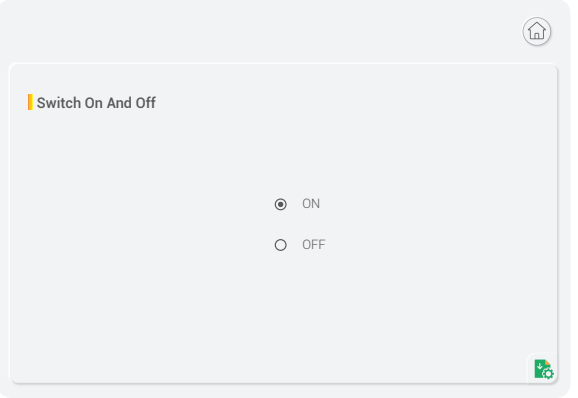
Click to enter the working status interface of load. Refer to section 5.1.2 (5) for more details.

6 **Setting**

Click to enter the setting interface. Refer to section 5.1.3 for more details.

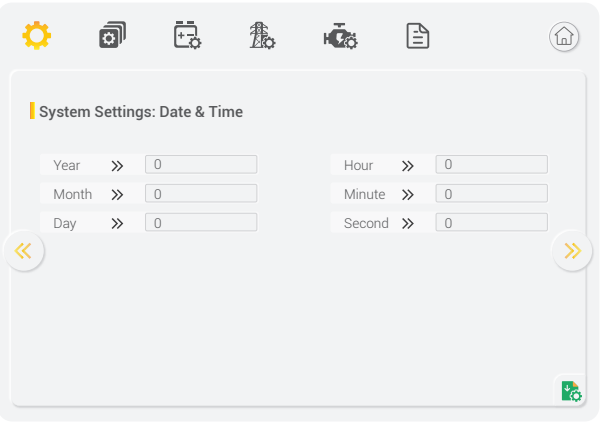
7 **Switch on/off**

Click to enter the switch on/off interface.



8 **Date and time setting**

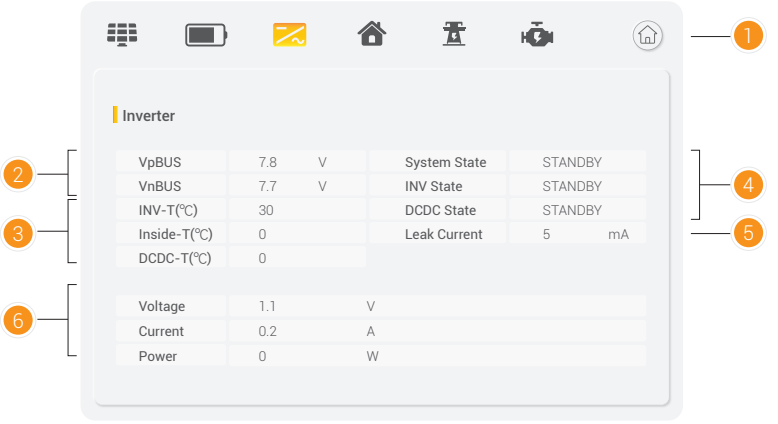
Click to enter the time setting interface. Refer to section 5.1.3 System setting (page 4) for more details.



5.1.2 Working status

(1) Energy storage inverter

Figure 5-2 Data panel of energy storage inverter



1 Users can click on the icon above to switch device status data (PV,Battery,Energy Storage Inverter, Load, Grid,Generator) and return to the Home Page. (not to be repeated later)

2 **VpBUS**: Real-time voltage of bus capacitor of the machine.

VnBUS: Real-time voltage of bus capacitor of the machine.

NOTE: The real-time bus voltage of this model is the sum of positive and negative buses.

3 **INT-T(℃):** Temperature of the inverter.

Inside-T (℃): Internal temperature of the device.

DCDC-T (℃): Internal temperature of DCDC.

Display status information, including System status, Inverter status, DCDC status and Parallel State.

4 **System status:** Displays complete device status information, including: INIT, STANDBY, PV GRID, BAT GRID, BYP,AC BAT CHG, HYBRID POW, etc.

INV state: Displays the inverter status information, including: STANDBY,OFF GRID, GRID, OFF GRID PL, INV TO PFC.

GRID: On-grid status

OFF GRID PL : The PFC rectification process of the inverter from off to on.

INV TO PFC: Switching from grid supply mode to grid-connected mode.

DCDC state: Displays charging and discharging status information,including: STANDBY, CHARGE, DISCHARGE.

Parallel State: Display the parallel status of the inverter,including: DISABLE, MASTER, SLAVE.

5 **Leak current**: Real-time leak current of the device.

6 The **voltage, current**, and **power** of the inverter side are displayed in real time.

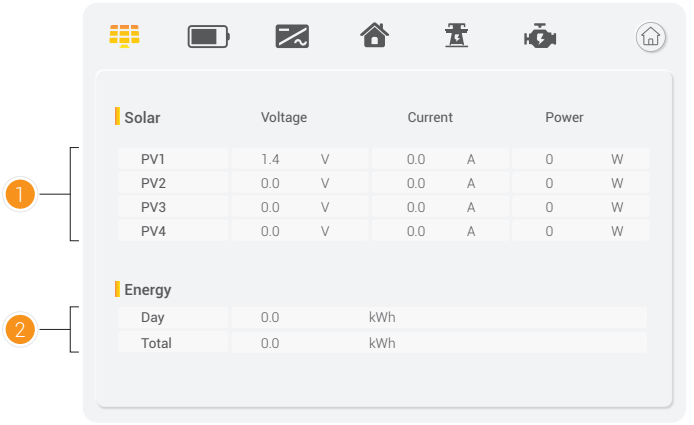
(2) PV

1 Display the operating parameters of the four PV channels (PV1, PV2, PV3, PV4), including real-time voltage, current, and power. (The PV input type can be configured in the settings.)

NOTE: Supports a maximum of 3 PV channels.

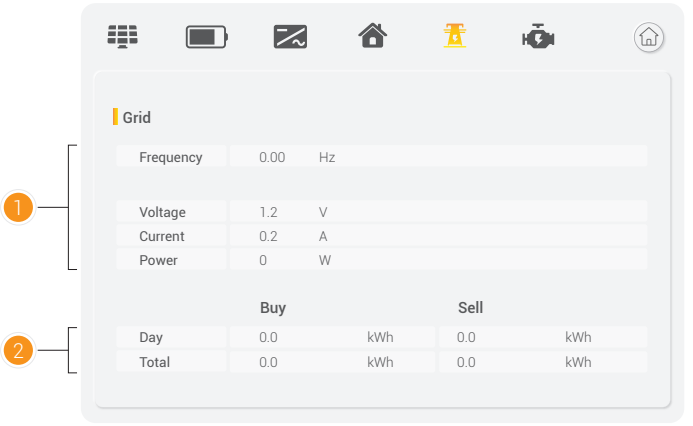
2 Display the cumulative charging capacity of the PV, including daily and total accumulated energy.

Figure 5-3 Data panel of PV



(3) Grid

Figure 5-4 Data panel of grid

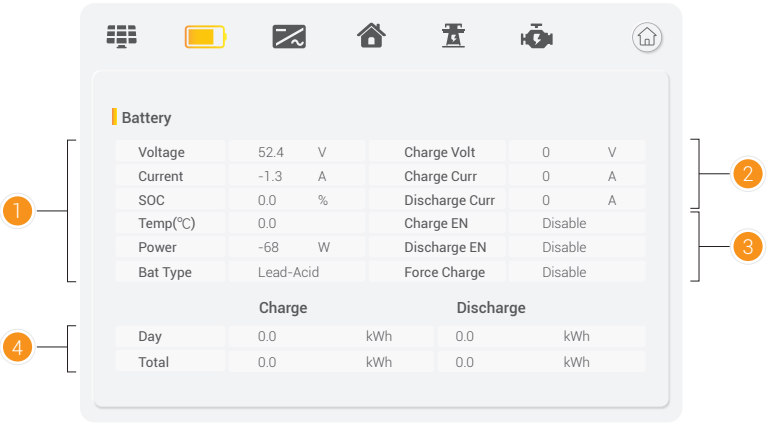


1 Displays the operating parameters of the grid, including frequency, real-time voltage, real-time current and real-time power.

2 Accumulated energy from the grid to the device (buy) and from the device to the grid (sell), including daily energy and total accumulated energy.

(4) Battery

Figure 5-5 Data panel of battery



1 Displays battery operating parameters, including real-time voltage, real-time current, remaining battery capacity, battery temperature, battery power, and battery type.

2 Display the maximum charge voltage, maximum charge current, and maximum discharge current transmitted by the battery BMS.

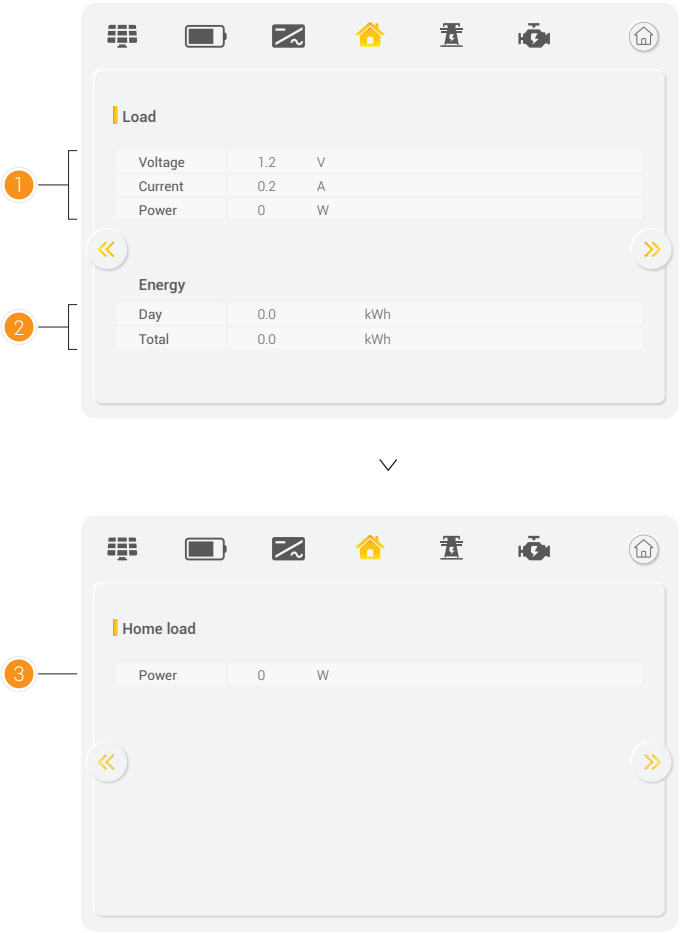
3 Three operating status of the battery (from BMS), including charging, discharging, and forced charging.

Charge EN: Charging enable **Discharge EN**: Discharging enable

4 Accumulated discharge and charge capacity of the battery, including daily and total accumulated energy.

(5) Load

Figure 5-6 Data panel of load



Click » to go to the next page; Click « to go back to the previous page.

When set Home load EN to "ENABLE", if you have a load connected to the mains port, you can see its Home load power.

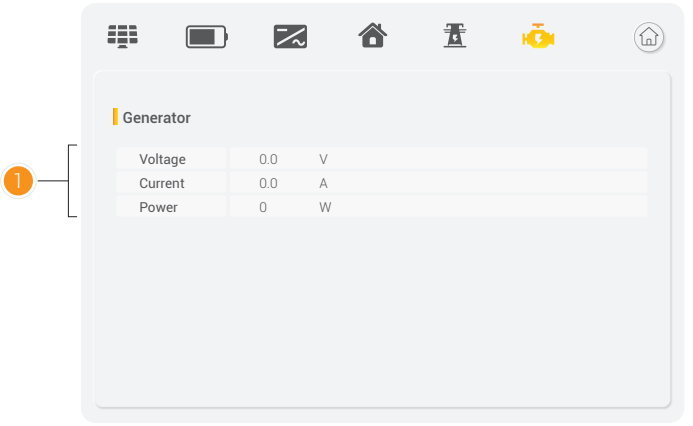
1 Displays the operating parameters of the load, including real-time voltage, current and power.

2 The accumulated power used by the load, including daily and total accumulated energy.

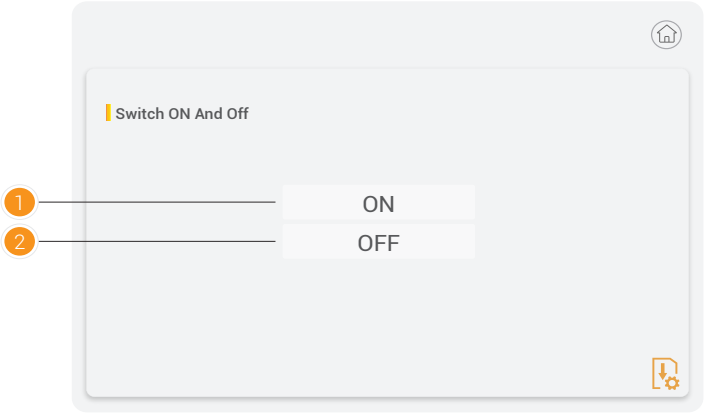
3 Displays the real-time power of the homeload.

(6) Generator (Not applicable to models listed in this manual)

Figure 5-7 Data panel of generator (Not applicable to models listed in this manual)



1 Displays the operating parameters of the generator, including real-time voltage, current, and power.



1. Power on,The energy storage inverter works.
2. Power of The energy storage inverter stops working.

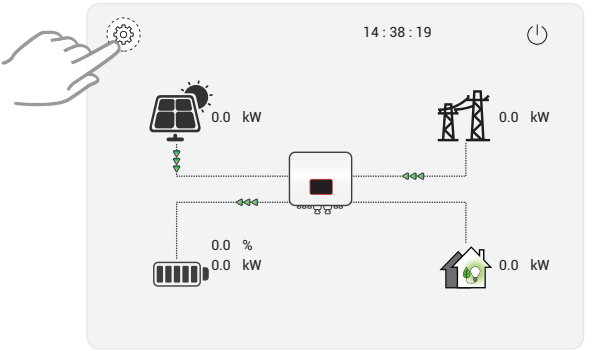
5.1.3 Setting

(1) How to enter setting page?

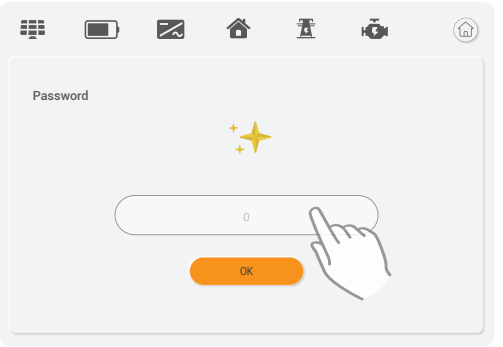
Click  to access the settings page.

The default password to enter the settings page is **11111**. Click **OK** to proceed to the settings page.

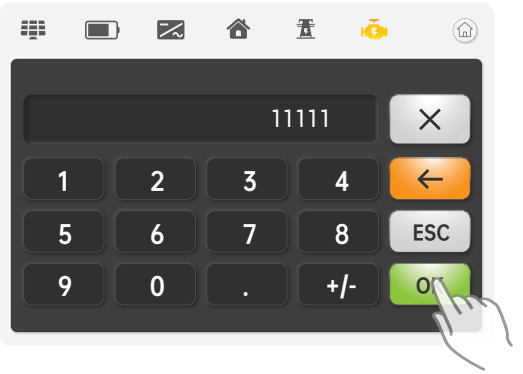
Step 1



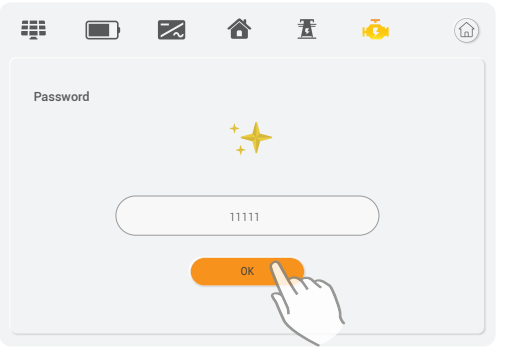
Step2



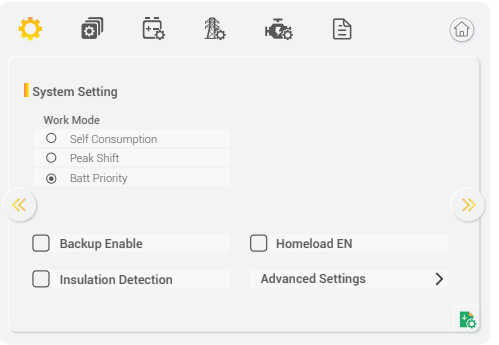
Step 3



Step 4



At this point, as shown below, the settings page is activated.

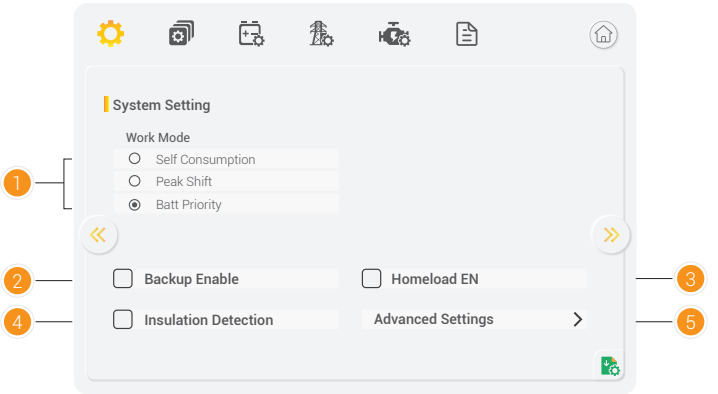


- Click on the top icon to switch between different sets of setting parameters.
- After the modification is completed, **you need to click in the bottom right corner to confirm (! important ; This description will not be repeated in subsequent sections.).**

System setting
Parallel setting
Battery setting
Grid setting
Generator setting
Machine information
Home page

5.1.3.1 Setting Option

- System setting (page 1)



1 Users have three working modes to choose from, Self Consumption, Peak Shift, and Battery Priority.

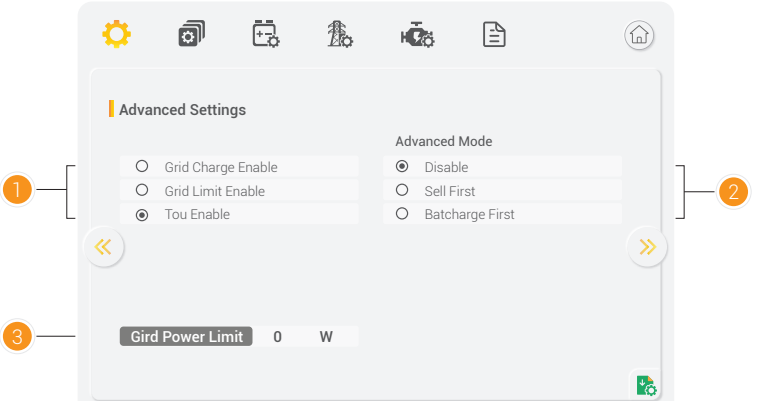
2 **Backup Enable**: When the Grid and PV are powered off, Enable the battery to supply power to the load, default option is enable.

3 **Homeload EN**: Enable home load statistics.

4 **Insulation Detection**: Insulation detect (The default option is enabled). When the insulation detection function is enabled in the grid connected state, the insulation detection is performed once a day when the photovoltaic energy comes in, and the inverter switches to the By-pass band load. If the inverter is off-grid, the output will be disconnected during insulation detect and the load will stop working.

5 **Advanced Settings** :Users can click to **Advanced Settings >** enter the advanced settings interface.

- Advanced Settings/ Page One:



1 Users have three advanced settings to choose from, namely Grid Charge Enable,Grid Limit Enable and TOU Enable.

Grid Charge Enable: In advanced mode, the grid will charge the battery only if this option is checked.

Grid Limit Enable: The Grid Power Limit function takes effect only

when you check it.

TOU Enable: Users need to check TOU Enable to enter the work mode of Time-of-use Enable.

2 **Advanced Mode**: There are three options here: Disable Mode,Sell First Mode and BatCharge First Mode. The advanced mode takes effect only in automatic self Consumption mode.

Disable: When the user selects "Disable", the two working modes, are invalid.Only if the other two options are selected, the two working modes (Sell Fiest,BatCharge First) take effect and work.

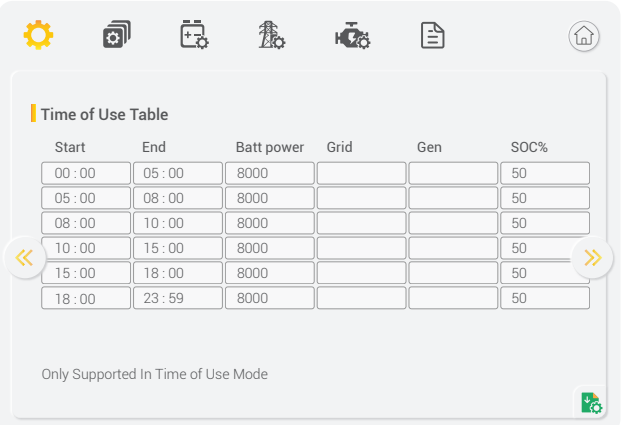
Sell First: In this mode, PV will be given priority to AC output, where the load priority is higher than the grid, and excess energy will be provided to the battery.

BatCharge Firs: In this mode, the PV will provide energy to the battery first, and the excess energy will be provided to the AC output, whose load is prioritized over the grid.

3 **Grid Power Limit:** When insufficient PV energy has been provided to the load, the priority is to provide energy from the grid, and the remaining energy is provided from the battery.

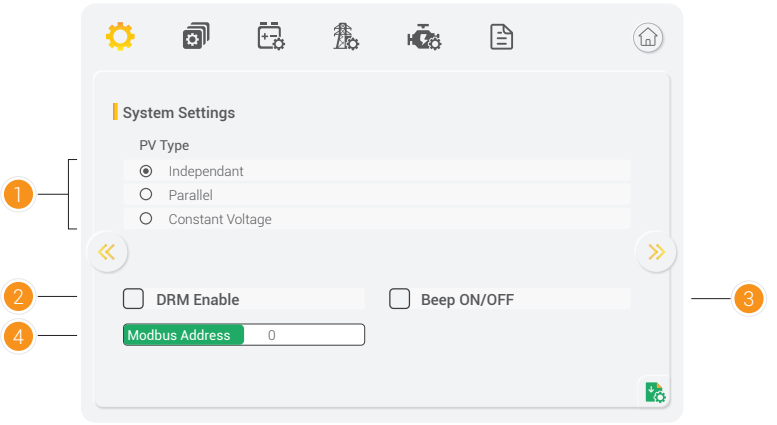
Click » to go to the next page (2nd page of the advanced settings).

- Advanced Settings/Page Two:



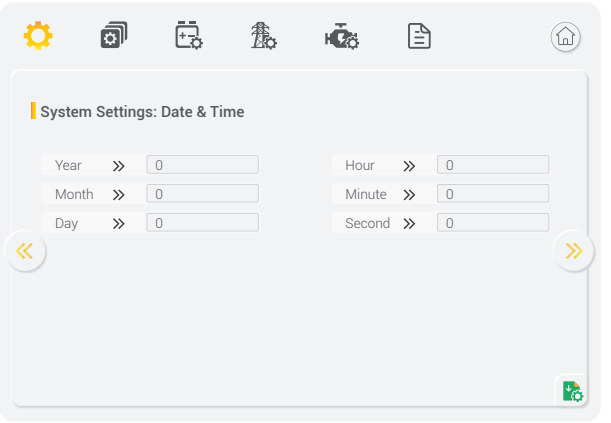
- **Time-of-use Enable :** There are 6 slots which can be programmed. If grid charge is enabled, the grid is used to power the load and charge the battery to target SOC at specific bat power attribute value. If selling electricity to the grid enable, the battery will discharge to target SOC at specific battery power attribute value.
- **Grid:** Grid is ticked, indicating that in the effective interval of the current interface time period, if the set SOC is greater than the actual SOC of the battery, the power grid will charge the battery (if not ticked, the power grid will not charge the battery); if the set SOC is less than the actual SOC of the battery, the battery can be discharged.
- **GEN:** GEN is ticked to indicate charging with GEN.
- **Batt power:** The power that the grid charges and discharges to the battery.

- System setting (page 2)



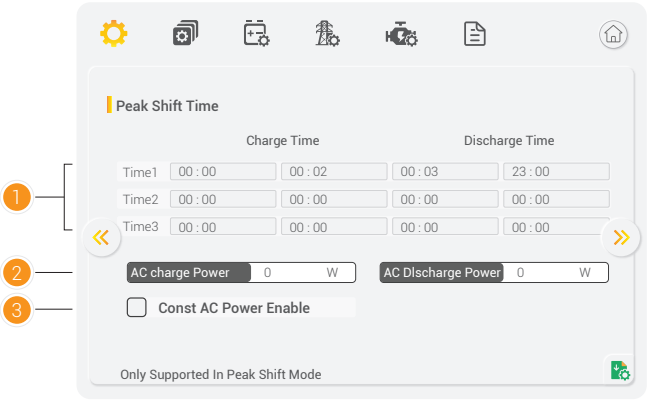
1. Users can set PV types, including Independent,Parallel and Constant Voltage.
   Independent: The factory setting defaults to **Independent**, when PV is input in parallel but set to standalone mode, PV generation will be unbalanced.
   Parallel: Commonly used for testing in parallel mode, two or three PVs are connected in parallel.
   Constant Voltage: Constant voltage model.
2. **DRM Enable**: Enable or disable demand response modes.
3. **Beep ON/OFF**: Users can enable or disable the beep function, which takes effect when the inverter alarms.
4. **Modbus Address:** The default modbus address is 1. Users can change the Modbus address as required.

- System setting (page 3)



- Date and Time settings
  Users can manually modify the year, month, day, hour, minute and second.
  The year input range should be between 2000 and 2099.

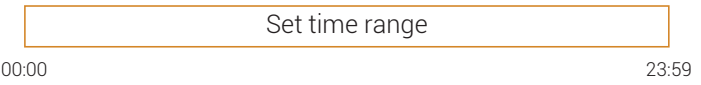
- System setting (page 4)



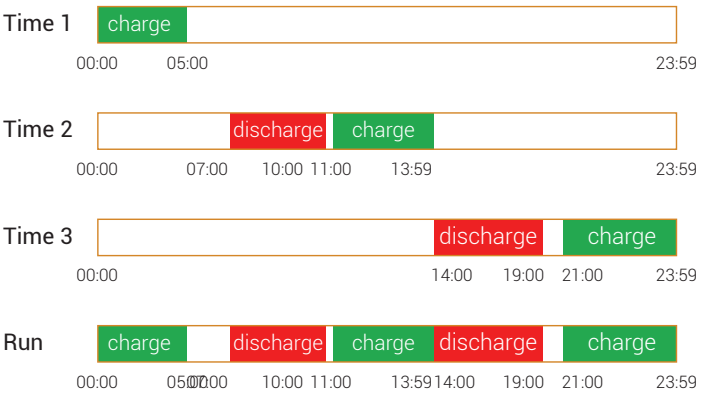
- Setting of charging and discharging time for Peak Shift.
- When the working mode is Peak Shift, users need to enter this interface to set the charging and discharging time.And Users need to manually input the start charge/discharge time and the end charge/discharge time.

1 WORK TIME:

a) The maximum allowable setting time is 24 hour (one day), It is allowed to set six different charging and discharging states within 24 hour(time1 twice,time2 twice,time3 twice), The inverter runs repeatedly every day according to the set time.



b) The inverter executes according to the settings of time1, time2 and time3 in the order of time. The following figure is an example. Different time periods do not overlap.



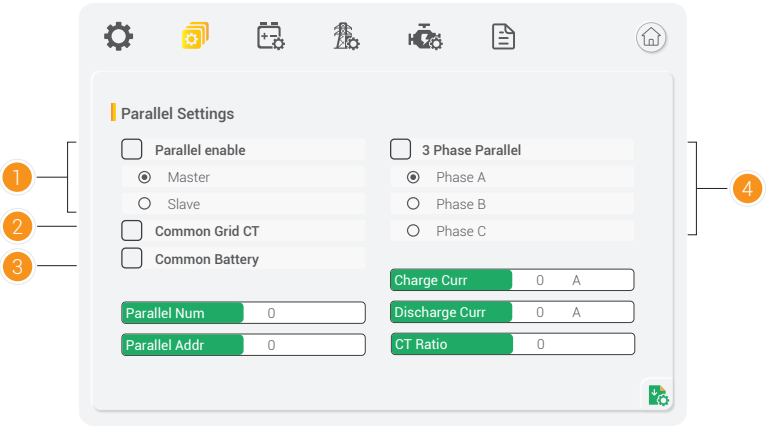
c) If you want to set a continuous charging time from the first night to the next morning. For example, you want charge battery form first day 21:00pm to next day 5:00am, divide this time period into two time periods (21:00~23:59, 00:00~05:00), and select two charging time periods from Time1, Time2 and Time3 and set them.

2 **AC charge Power:** This feature only works in Peak shift mode,during the charging period, when the PV is not enough to provide energy to the battery, It will draw energy from the grid based on power Settings.

AC Discharge Power: This feature only works in Peak shift mode,during the discharge period,supply energy to the grid at the set power, the actual power depends on the setting and the grid discharge power which is less.

3 **Const ACPower Enable:** The AC charge Power and AC Discharge Power functions take effect only when this option is selected.

- Parallel setting



1 **Parallel enable:** Start or disable the parallel function.

Master/Slave: This interface is used for parallel, and the inverter is selected as the master or slave.

2 **Common Grid CT:** Enable or disable CT sharing.

3 **Common Battery:** Enable or disable Battery sharing.

4 **3 Phase Paralle:** Enable or disable group 3 phase enable.

PHASE A/B/C: This interface is used to select the output phase of the device when three phases are used. (Reserved function).

Parallel num: This operation is used to select the number of parallel machines.

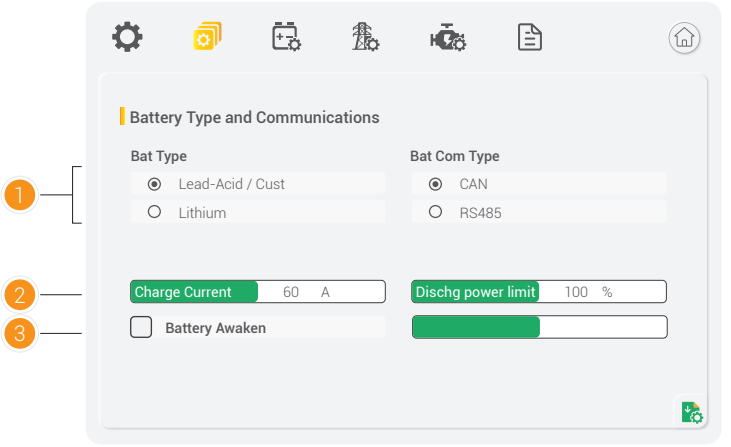
Parallel addr: This interface is used to select the parallel address, the host address is set to 1 by default, there is a slave, and the slave is set to 2; If there are two slaves, the slaves are set to 2 and 3 respectively; the address settings of each inverter cannot be the same.

CT Ratio: Set the detection ratio of CT.Set the CT ratio to 1000:1 by default.

Charge Curr: Set the charging current of parallel machine.

Discharge Cur: Set the discharge current of parallel machine.

- Battery setting (page 1)



1. Setting battery type and battery communication method

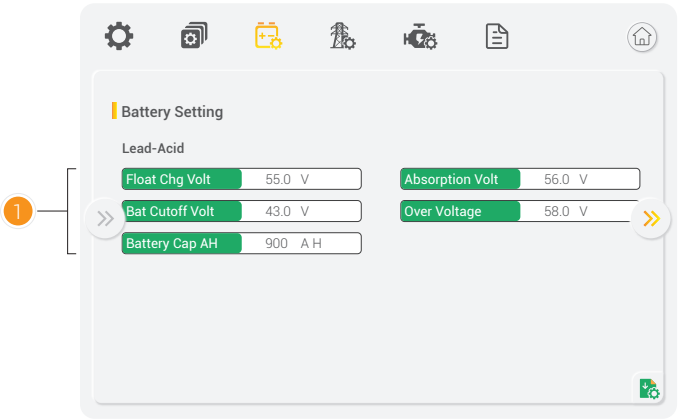
   User can select battery type as lead-acid/li-ion battery and battery communication mode as CAN/485. The default option is CAN.

2. Users can manually input the value of charging current and discharge power limit.

3. **Battery wake-up**: When the battery is low and the battery relay has been disconnected, the inverter will send instructions to the battery

forcibly sucking relay by BMS, and the inverter will charge.
The default option is disabled. (Partial battery support)
If you want to use this feature, please consult the battery brand supported by the dealer. Use it only when the battery is too low. After the battery wakes up successfully, please turn off the function, otherwise it will affect the normal operation of the machine.

- Battery setting (page 2)



1 Settings required when using lead-acid batteries.

Float Chg Volt: Charge the battery with constant voltage and small current (This interface is used to set the lead acid battery charging voltage. (The input value ranges from 40 to 59.5)Set the floating charge voltage to be less than the constant charge voltage).

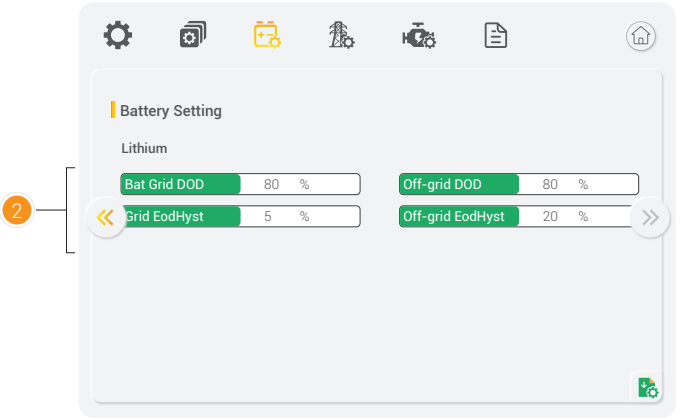
Bat Cutoff Volt: Discharge protection voltage (This interface is

used to set the lead acid battery discharging voltage. (The input value ranges from 40 to 51) Discharge cut-off voltage, as recommended by the battery manufacturer).

Battery Cap AH: Battery capacity (This interface is used to set the lead acid Battery capacity. It is related to the input power. (The input value ranges from 50 to 1000) The battery capacity setting will affect the maximum charging current, for example, set 100Ah, the maximum charging current is 100A*0.2=20A).

Absorption Volt: Charge the battery with constant current.

Over Voltage: Charging protection voltage (This interface is used to set the lead acid battery Charge protection voltage. (The input value ranges from 50 to 59.5) Charge protection voltage, as recommended by the battery manufacturer).

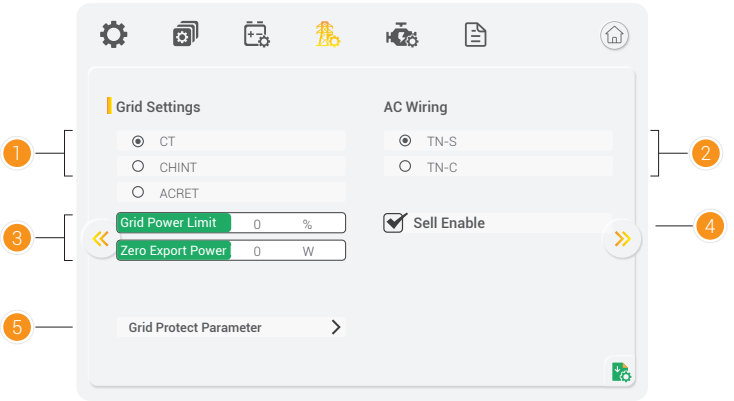


2 Settings required when using lithium.

Bat Grid DOD/Grid Eod Hyst: When the battery discharge is higher than the set parameter, the inverter generates a battery low voltage alarm.

Off-grid DOD/Off-grid Eod Hyst: When a low-voltage alarm is generated, the alarm is cleared if the battery charge is higher than the specified amount.

- Grid setting (page 1)



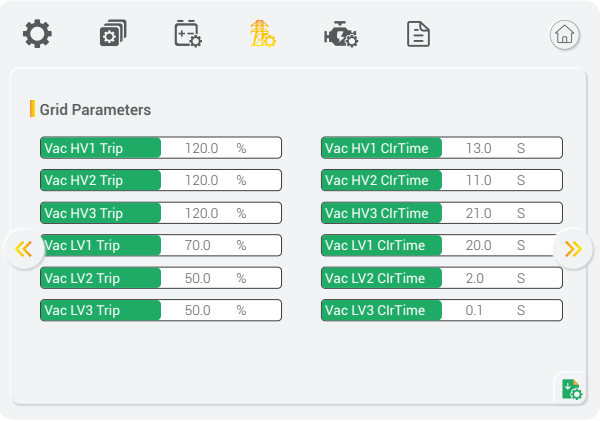
1. Users can choose to use CT or electricity meter to detect the grid current, currently supported by the grid manufacturers CHINT and ACREL.
2. **Users can set the AC wiring system to TN-S or TN-C**
3. **Grid Power Limit**:Users can click to enter the numerical input interface. This function is used to limit the inverter conversion power of the inverter. The default parameter is 100%.
   ZeroExpower:If the sampling error occurs when there is no power in the grid, the user can set the corresponding value to correct it.

4 **Sell Enable:** Whether the inverter is allowed to sell electricity to the grid. The option is checked, which means that the inverter can generate electricity to the grid.

5 **Grid Protect parameter:** Users can click to **Grid Protect Parameter >** enter the advanced settings interface.

- Grid parameters (page 1)

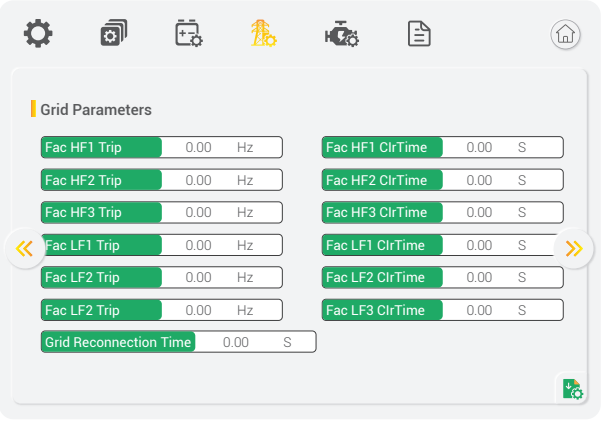
On this page, users can set overvoltage protection, overvoltage protection time, undervoltage protection, and undervoltage protection time.When grid standards are set, these values are automatically updated according to local safety regulations.



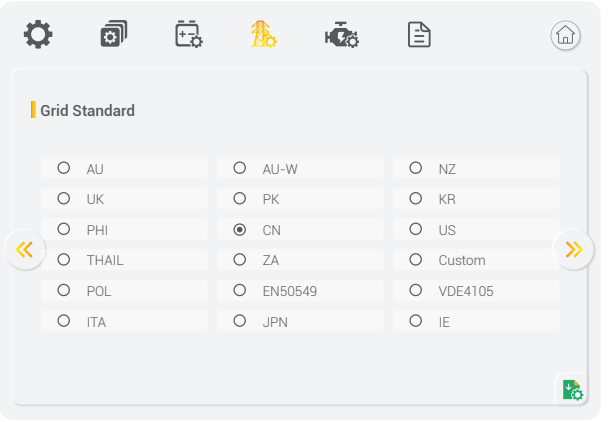
- Grid parameters (page 2)

On this page, users can set overfrequency protection, overfrequency protection time, underfrequency protection, underfrequency protection

time, and grid reconnection time.When grid standards are set, these values are automatically updated according to local safety regulations.



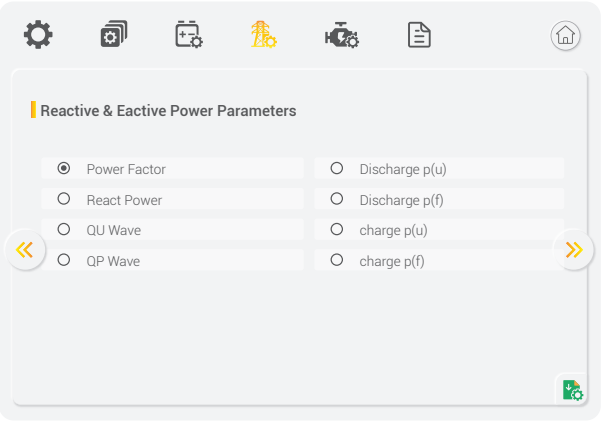
- Grid setting (page 2)



It is used to select the grid standard. You can set and switch the grid standard according to your needs.

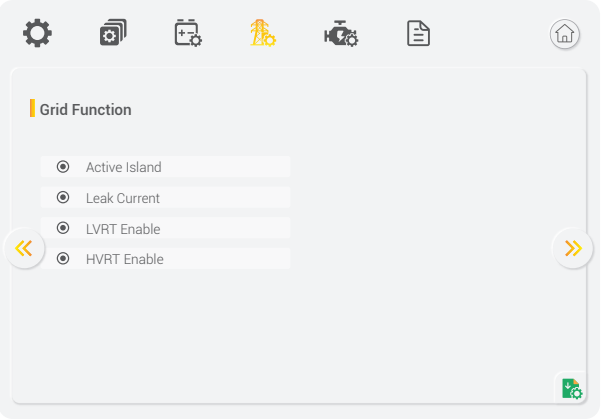
AU: Australia
AU-W: Western Australia
NZ: New Zealand
UK: United Kingdom
PK: Pakistan
KR: Korea
PHI: Philippines
CN: China
TSAIL: Thailand
AT: Austria
US: America
ZA: South Africa
Custom: User defined
POL: Poland
EN50549
VDE4105
ITA: Italy
JPN: Japan
IE

- Grid setting (page 3)



- **REACT Power Parameter:** REACT Power Parameter, including: Power Factor, React Power, QU Wave, QP Wave.(For specific country if required by the local grid.)
- **Power Factor:**The input value should range between L0.80 and L0.99 or C0.8 and C1.00.
- **React Power:** Reactive power control
  The input value should range between -60% and +60%, which varies with the standard.
- **QU Wave:** Voltage-reactive curve.
- **QP Wave:** Active power-reactive power curve.
  (These two functions are not available on the screen, please contact the distributor if you need to use them.)
- **Disharge P(u):** Disharge voltage response.
  When the grid voltage is abnormal, the active power is limited, and the function is enabled when required by the national grid standard.
- **Disharge P(f):** Disharge frequency response.
  When the power grid frequency is abnormal, the active power will be limited, and the function will be enabled if required by the national power grid standard.
- **Charge P(u):** Charge voltage response.
  When the grid voltage is abnormal, the charging power will be limited, and the function will be enabled if required by the national grid standards.
- **Charge P(f):** Charge frequency response.
  When the power grid frequency is abnormal, the charging power will be limited, and the function will be enabled if required by the national power grid standard.

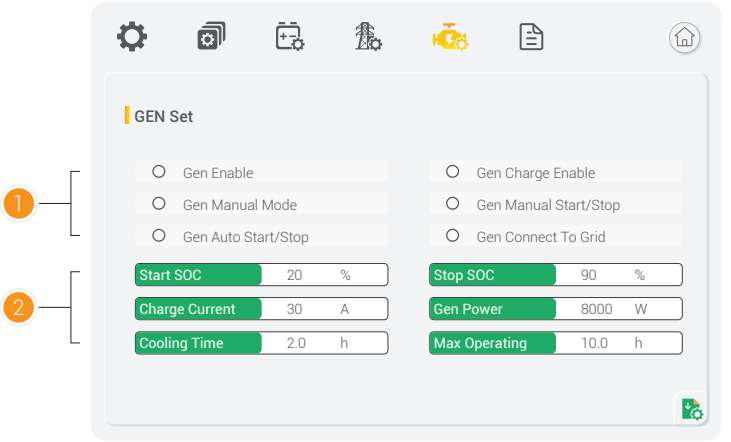
- Grid setting (page 4)



- **Anti-Island:** Anti-Islanding(The default option is enable).
  When the grid goes down, inverter will detect the loss of power and disconnect from the grid within milliseconds. It prevents your solar panels from feeding electricity into a downed power line.
- **Leak current:** Leak current detect (The default option is enabled).
- **LVRT Enable:** When the inverter is connected to the grid, the grid voltage suddenly drops, and the inverter can still be connected to the grid for a short time. To use this function, turn off Backup Enable.
- **HVRT Enable:** When the inverter is connected to the grid, the grid voltage suddenly rises, and the inverter can still be connected to the grid for a short time. To use this feature, turn off Backup Enable.

- Generator setting

Not applicable to models listed in this manual.



1 Diesel generator enable settings:

Gen Enable: Enable control of the Generator function.

Gen Chare Enable: Generator Charge Enable control.

Gen Manual Mode: If the user wants the Generator to be controlled manually, enable it (Manual control enable and automatic control enable are mutually exclusive when set).

Gen Manual Start/Stop: The on/off command in manual control mode.

Gen Auto Start/Stop: If the user wants the Generator to be automatically controlled to start and stop through the dry contact, please enable it.

Gen Connect to Grid: Connect the diesel Generator to the grid input port.

2 Diesel generator parameter setting:

Start SOC: When the SOC of battery is lower than the setpoint, the Generator dry contact is enabled and Generator Manual operation is disabled, the connected Generator will be started.

Stop SOC: When the SOC of battery is higher than the set point, the Generator dry contact is enabled and Generator Manual operation is disabled, the connected Generator will be stopped (START SOC < STOP SOC).

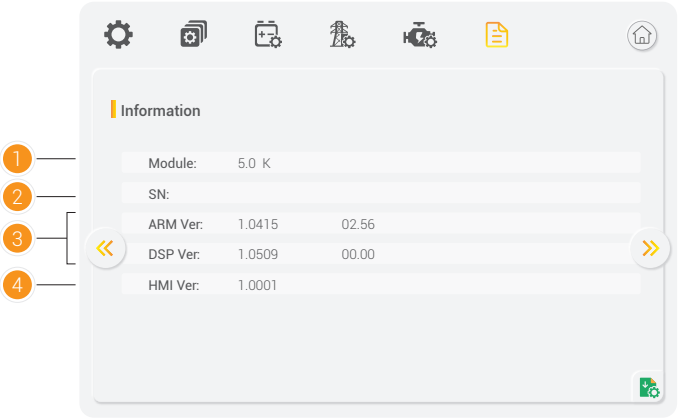
Charge Current: It indicates the maximum current that the inverter charges the battery from Generator.

Gen Power: Rated power of Generator.

Cooling Time: It indicates the waiting time of the Generator to restart after it has reached the running time. The unit is 0.1 hour.

Max Operating: It indicates the longest time Generator can run in one day, when time is up, the Generator will be turned off. The value 240 means 24hours in which state the Generator will not be shut down all the time. The unit is 0.1 hour.

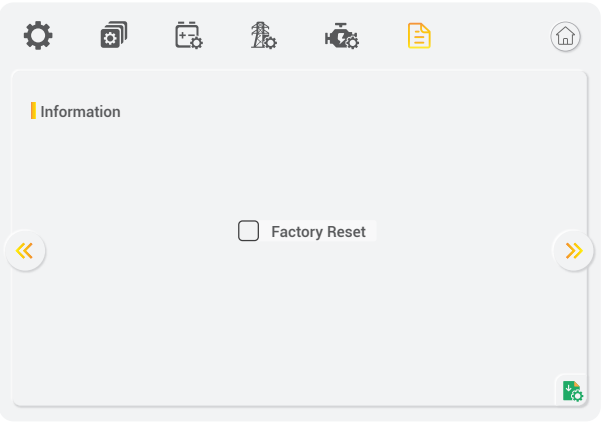
- Machine Information (page 1)



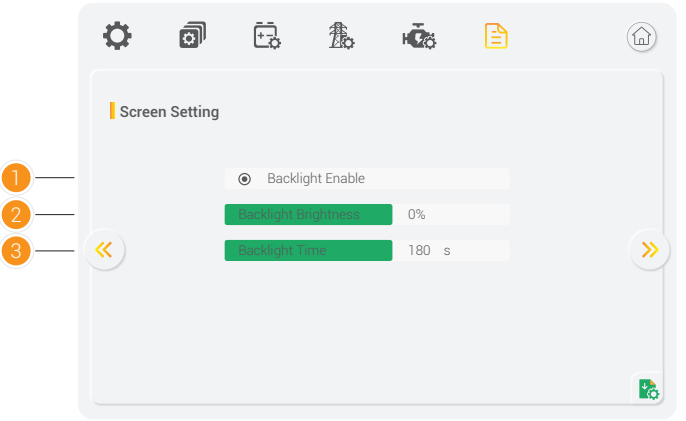
1. Displays the inverter model
2. Displays the inverter SN
3. Displays software version
4. Displays HMI version

- Machine Information (page 2)

  This interface is used to reset the inverter.

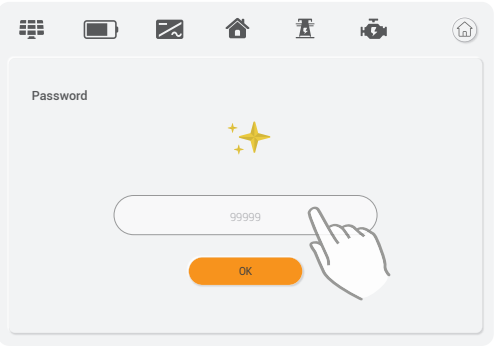


- Machine Information (page 3)

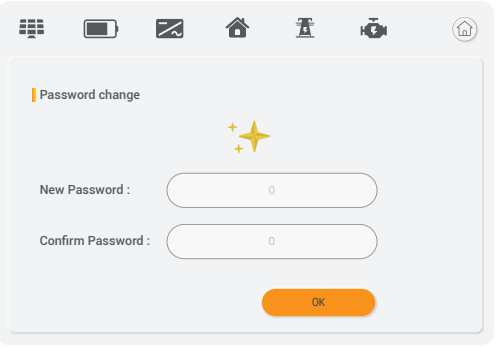


1. LCD backlight is enabled. It is enabled by default.
2. Backlight brightness adjustment. The default value is 0, and the value ranges from 0 to 100%.
3. Backlight time setting. The default value is 180s.and the value ranges from 5 to 250s.

- Administrator account



Users can set "99999 to enter the administrator account ,change the initial password.



Click on Machine Information Page four, Change the default password. This page is displayed only when you enter the administrator account.

5.1.4 LED indicators

Only for models without screen.

INV Status

	Always on	Normal	Green
	Blinks 3s	INV Standby	
	Always on	Fault*1	Red
	Blinks 3s	Alarm*1	Blinks
	Blinks 1s	Alarm*2	

DCDC Status

	Always on	Normal	Green
	Blinks 3s	DCDC Standby	Red
	Always on	Fault*2	
	Blinks 3s	Alarm*3	Blinks
	Off	Fault*3	Off

Status	Error/Alarm Codes
Fault*1	A33~A36, A39, A40, A43,A45,A46
Fault*2	A38, A39, A42, A44
Fault*3	A03
Alarm*1	A01, A07~A10, A14, A19~A22
Alarm*2	A11, A15, A16
Alarm*3	A01, A04~A06, A24~A28

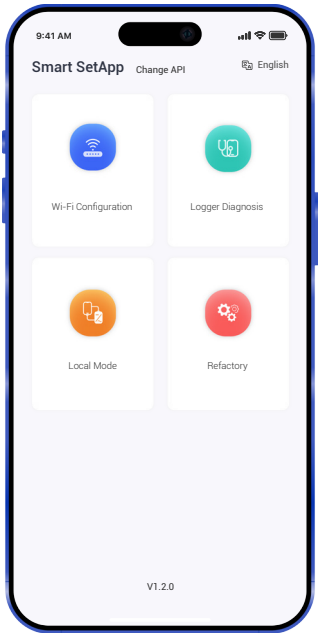
Refer **Chapter 6** for more informations about the error/alarm codes.

Battery disconnection or (and) low battery voltage will cause the battery light to turn red.

5.2 APP Operation

5.2.1 Home page

The home page includes Wi-Fi configuration , Logger Diagnostics, Local Mode, ReFactory, Language toggle (click it on the top right corner to switch languages), and Change API.

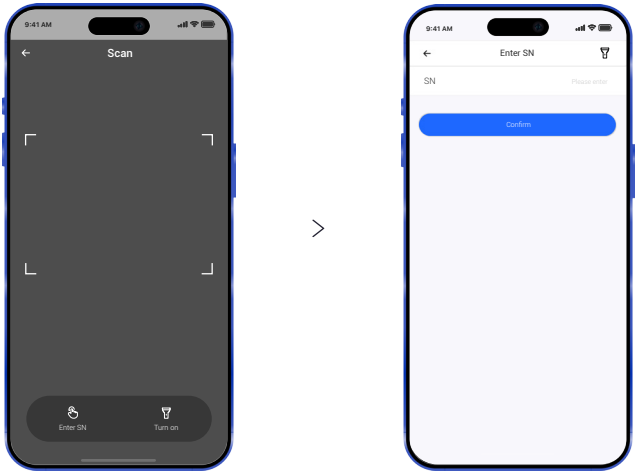


When using the Smart SetApp, the goal is to be able to view the relevant status of the device in real time and control it wirelessly.
The APP provides the user with two types of connectivity, IoT remote mode (configured by the user according to the SOLARMAN Smart APP's user manual) and local mode.

5.2.2 Local Mode

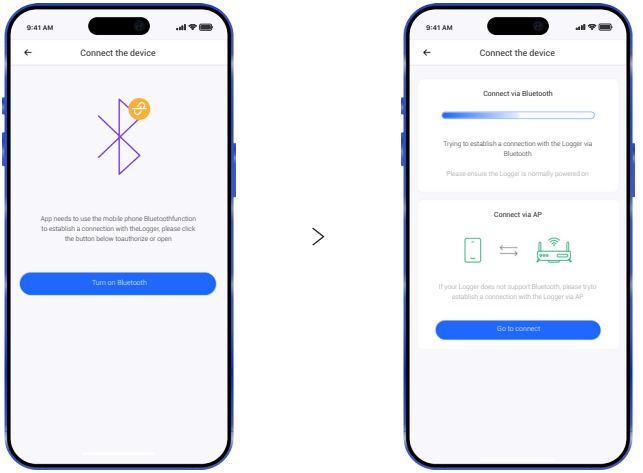
- Add a logger
  Click on **Local Mode**, it will immediately jump to the scanning

interface. Scan to enter logger SN (You can find logger SN in the external packaging or on the logger body) or click **Enter SN** to manually enter the SN.

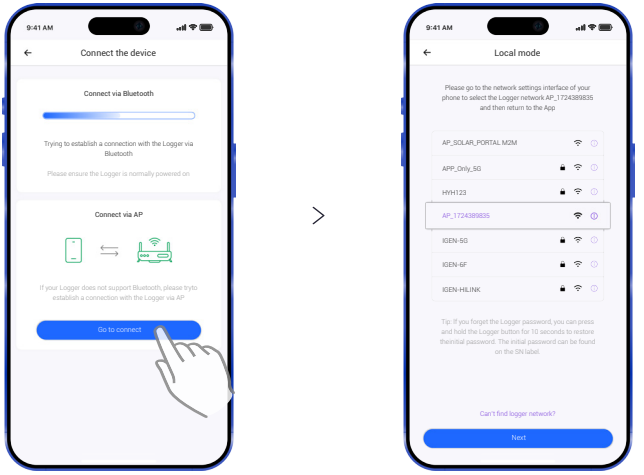


- Bluetooth ON

  Local mode supports Bluetooth connection. You can turn on Bluetooth in advance or add a logger first, then turn on Bluetooth according to the page prompt. If the connection fails, users need to reconnect.



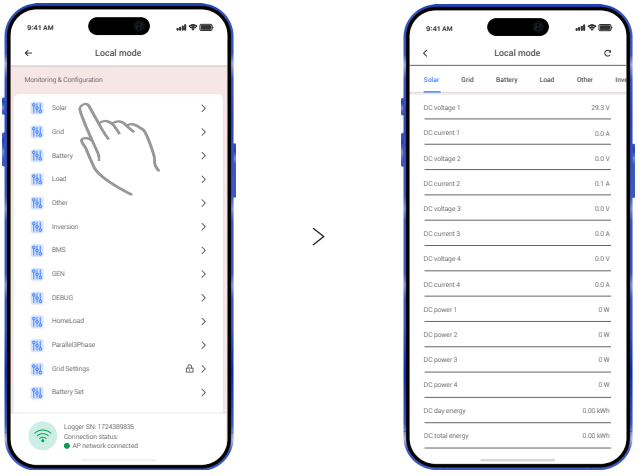
or:



- Enter the local mode interface

  Once the connection is complete, you can view the operating status of the device and the parameters set.

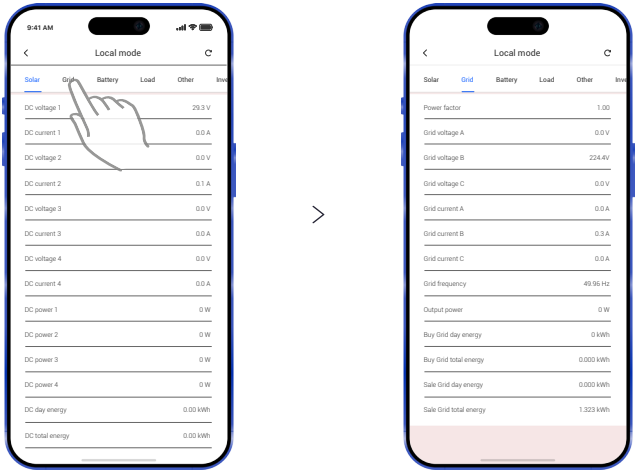
  Click on the grouping to go to the detailed parameter page.



Click on the top groups to switch.

The Monitoring & Configuration page contains the following

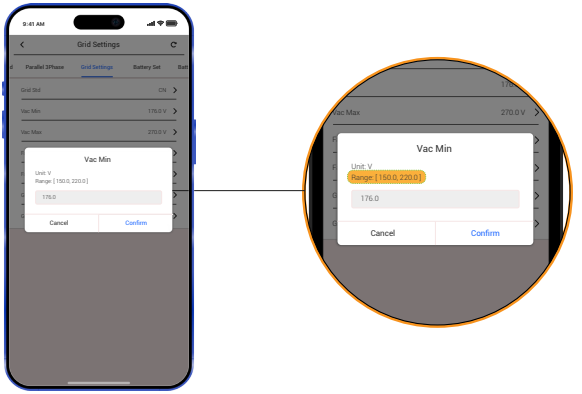
subgroups: Solar, Grid, Battery, Load, Other(Display software version,



SN code, fault information, working mode, device temperature, inverter temperature, etc.), Inversion, BMS, GEN, DEBUG, HomeLoad, Parallel 3Phase.

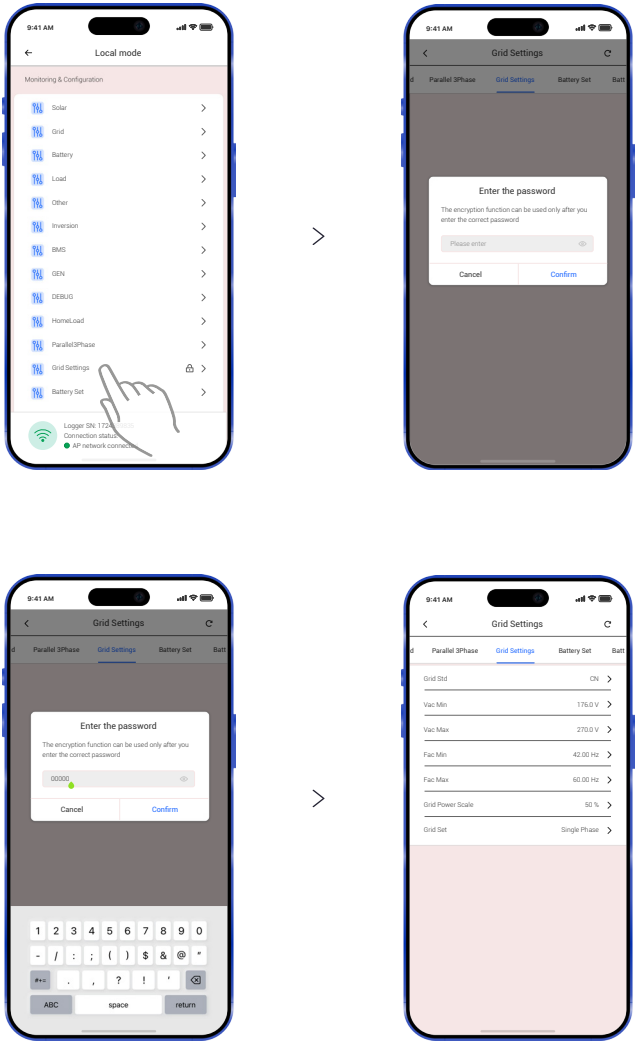
5.2.3 Set Parameters

You can set the operating parameters of the device according to their needs. The parameters set by the user need to be within the specified range.

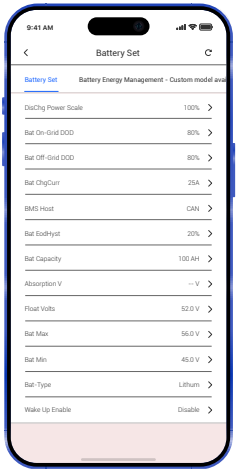


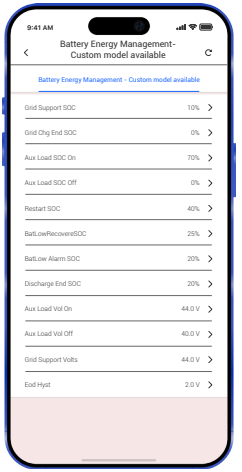
- Grid Settings and Grid Protect Set

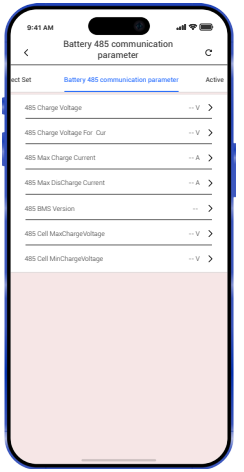
  A password is required to access the grid settings. The default password is "00000".



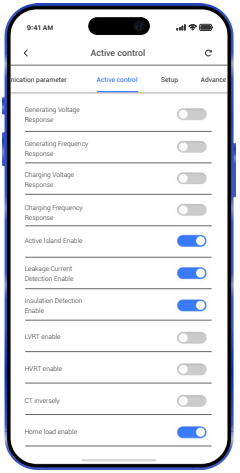
- Battery Set , Battery Management-Custom model available and Battery 485 communication parameter





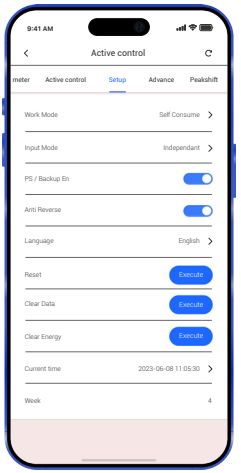


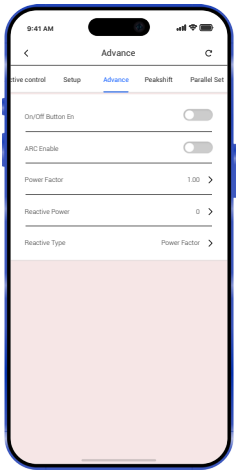
- Active Control



- Setup & Advance

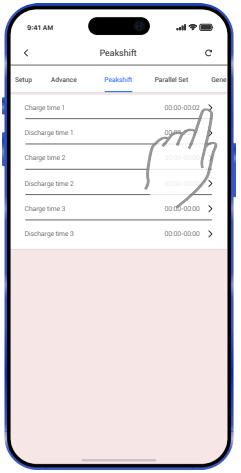
  Set work mode and PV input type, language, date/time, etc.

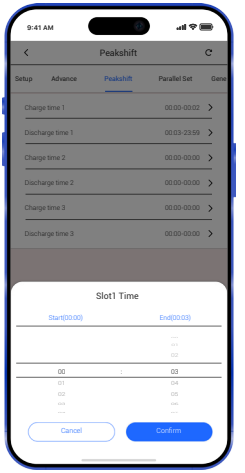




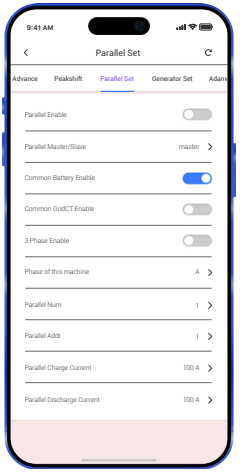
- Peak shift

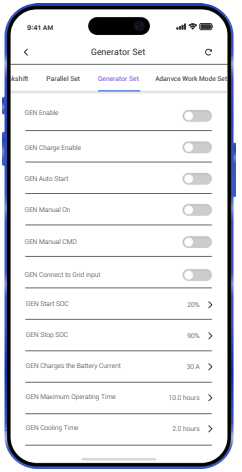
  Set peak-shift charging and discharging time. When the operating mode is peak-shift, you need to enter this screen to set the charging and discharging time and manually enter the start charging/ discharging time and the end charging/discharging time.

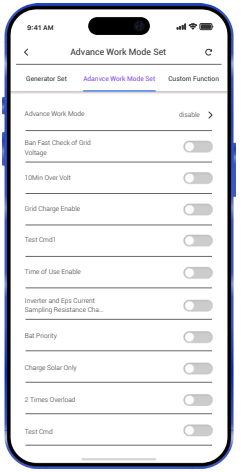


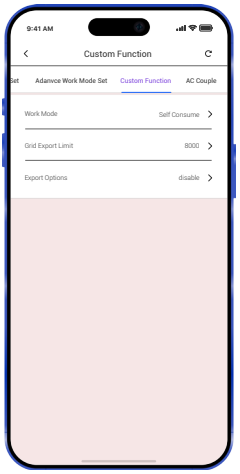


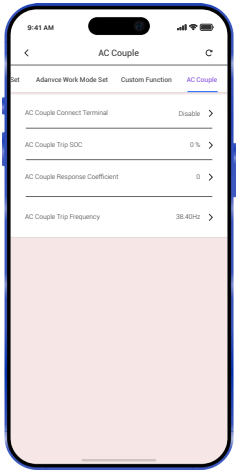
- Parallel Set, Generator Set (Not applicable to models listed in this manual), Advance Work Mode Set, Custom Function and AC Couple.





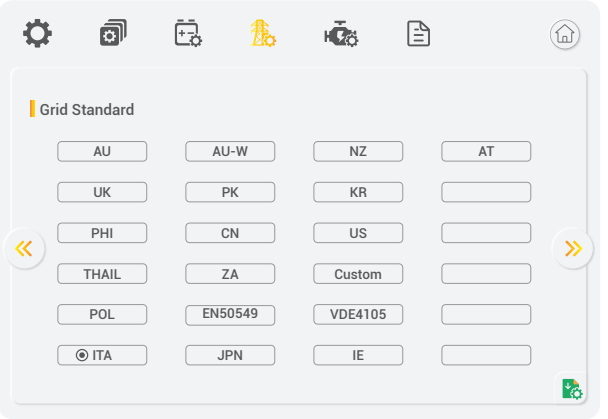




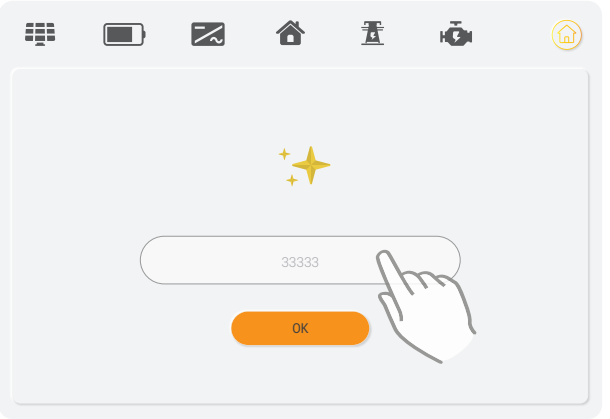


5.3 Italy self-testing (Auto test Fast)

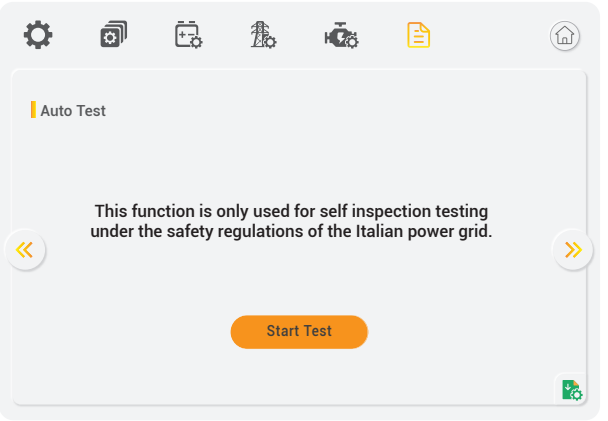
As shown in the picture below, the power grid standard is ITA. Ensure that the power grid is connected and the inverter is error-free, otherwise do not test.



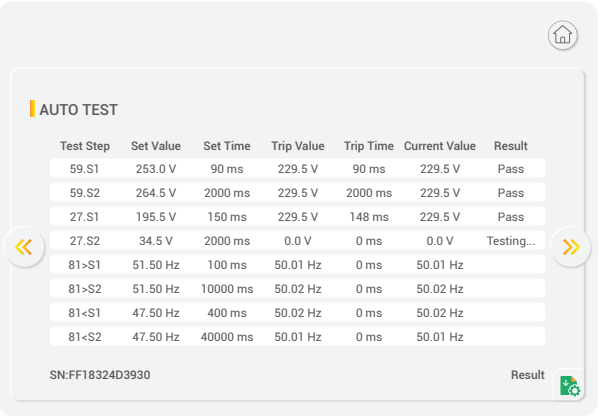
Click the setting icon in the upper left corner of the LCD screen to enter the password input interface, enter the password "33333", and click ok, as shown in the picture below :



Enter the Italy self-test interface and click Start test, as shown in the picture below :



Wait until the test is complete, as shown in the picture below :

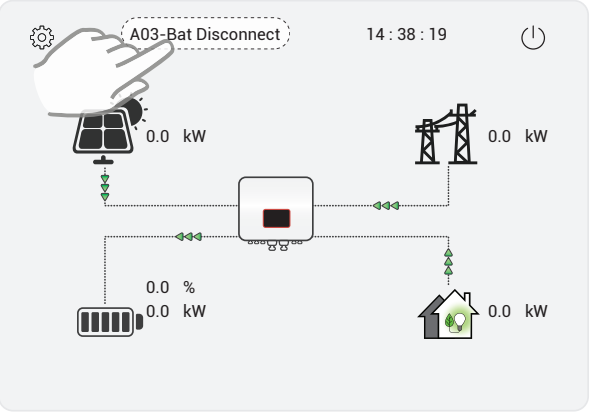


Object	Description
27.S1	Under voltage protectio
27.S2	Under voltage protectio
59.S1	Over voltage protecti
59.S2	Over voltage protecti

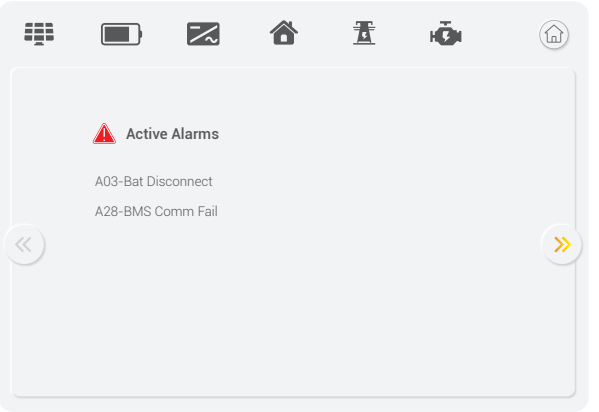
Object	Description
81<S1	Under frequency protectio
81<S2	Under frequency protectio
81>S1	Over frequency protection
81>S2	Over frequency protection

6 Fault Diagnosis and Solutions

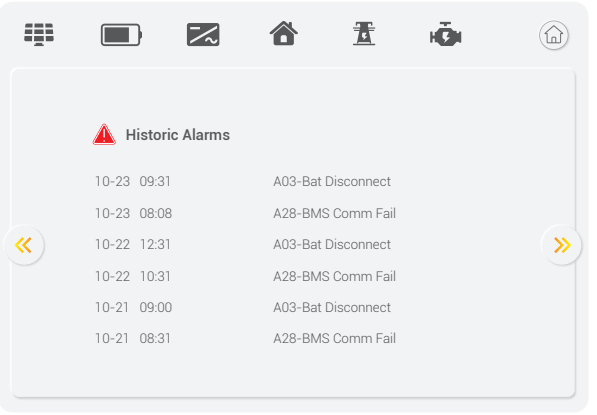
When an alarm occurs, the alarm code and description are shown on the home page of the display.



Click on the alarm to go to the page for alarms, which will first display the Active Alarms page:



Then click » to go to the next page to display the Historic Alarms page:



The following table lists some basic problems that may occur in practice and the corresponding basic solutions. When you encounter the following problems, please refer to the following solutions.

If the problem is still not solved, please contact your local distributor.

Codes:	A01
Content:	Discharge Over Current

Explanation:

Battery discharge over current. When the battery is loaded, the load is too large.

Solutions:

- Nothing need to do, Wait one minute for the inverter to restart.
- Check whether the load is in compliance with the specification.
- Disconnect all power and shut down all inverters; disconnect the load and restart the inverter with power.

Codes:	A02
Content:	Over Load

Explanation:

The load power is greater than other power(PV,BAT).

Solutions:

- Check whether the load is in compliance with the maximum power of the inverter.
- Disconnect all power and turn off all inverters; disconnect the load, power up and restart the inverter, and if the fault has been cleared, check the load again for a short circuit.
- If the error/warning remains, please contact customer service.

Codes:	A03
Content:	Bat Disconnect

Explanation:

Battery Disconnect. (Battery voltage not identified)

Solutions:

- Check whether the battery is connected.
- Check if battery wiring port is open circuited.
- If the error/warning remains, please contact customer service.

Codes:	A04
Content:	Bat Under Vol

Explanation:

Battery voltage is too low, and battery is not allowed to discharge.

Solutions:

- Checking system settings, re-power and restart.
- Check if the grid power down. If so, waitting for the grid power up, the inverter will automatically charge.
- If the error/warning remains, please contact customer service.

Codes:	A05	Solutions:
Content:	Bat Low Volt	Low battery setting capacity(SOC<100%-DOD)
Explanation: The battery voltage is low.		

Codes:	A06	Solutions:
Content:	Bat Over Volt	• Checking system settings, re-power and restart. • If the error/warning remains, please contact customer service.
Explanation: The battery voltage is over than the Inverter maximum voltage.		

Codes:	A07 / A08	Solutions:
Content:	Gird low volt / over volt	• Check if the grid is abnormal. • Restart the inverter and wait until it functions normally. • If the error/warning remains, please contact customer service.
Explanation: Grid voltage is abnormal.		

Codes:	A09 / A10	Solutions:
Content:	Gird low Freq / over Freq	• Check if the grid is abnormal. • Restart the inverter and wait until it functions normally. • If the error/warning remains, please contact customer service.
Explanation: Grid Frequency is abnormal.		

Codes:	A11
Content:	Gfci over

Explanation:

Inverter GFCI exceeds standard.

Solutions:

- Check PV string for direct or indirect grounding phenomenon.
- Check peripherals of inverter for current leakage.
- If the error/warning remains, please contact customer service.

Codes:	A14
Content:	Bus under volt

Explanation:

BUS voltage is lower than normal.

Solutions:

- Check the input mode setting is correct.
- Restart the inverter and wait until it functions normally.
- If the error/warning remains, please contact customer service.

Codes:	A15
Content:	Bus over volt

Explanation:

BUS voltage is exceeds maximum value.

Solutions:

- Check the input mode setting is correct.
- Restart the inverter and wait until it functions normally.

Codes:	A16
Content:	INV over current

Explanation:

The inverter current exceeds the normal value.

Solutions:

Restart the inverter and wait until it functions normally.

Codes:	A17
Content:	Charge over current

Explanation:

The battery charging current exceeds the maximum current of the inverter.

Solutions:

Restart the inverter and wait until it functions normally.

Codes:	A19 / A20
Content:	INV under volt / over volt

Explanation:

INV voltage is abnormal.

Solutions:

- Check if the INV voltage is abnormal.
- Restart the inverter and wait until it functions normally.
- If the error/warning remains, please contact customer service.

Codes:	A21
Content:	INV freq abnor

Explanation:

INV frequency is abnormal.

Solutions:

- Check if the INV frequency is abnormal.
- Restart the inverter and wait until it functions normally.
- If the error/warning remains, please contact customer service.

Codes:	A22
Content:	IGBT temp high

Explanation:

The inverter temperature is higher than the allowed value.

Solutions:

Disconnect all power from the inverter, wait one hour, and then turn on the power to the inverter.

Codes:	A23	Solutions:
Content:	BMS sys erro	
Explanation: BMS internal communication failure or BMS system error.		Please contact customer service.

Codes:	A24	Solutions:
Content:	Bat over temp	
Explanation: Battery temperature is higher than the allowed value.		Disconnect the battery and reconnect it after an hour.

Codes:	A25	Solutions:
Content:	Bat Under Temp	
Explanation: Battery temperature is lower than the allowed value.		Check the ambient temperature near the battery to comfirm it meets the specifications.

Codes:	A26	Solutions:
Content:	Bat Cell Unball	
Explanation: BMS alarms battery cell unbalance.		The alarm from BMS is cleared.

Codes:	A27	Solutions:
Content:	Bat Reverse	
Explanation: Battery input positive and negative reversed.		Disconnect battery and adjust positive and negative wiring.

Codes:	A28	Solutions:
Content:	BMS Comm fail	
Explanation:		• Check the cable, RJ45 header, line sequence. • Checking the Battery switch.
Communication between lithium battery and inverter is abnormal.		

Codes:	A29	Solutions:
Content:	Bat fail	• Check whether the battery is abnormal. • Check whether the battery BMS alarm is normal.
Explanation:		
The battery failed.		

Codes:	A30	Solutions:
Content:	Grid Over Load	
Explanation:		Reserved.
Reserved.		

Codes:	A31	Solutions:
Content:	Grid Phase error	
Explanation:		Check power grid wiring
The power grid phase sequence is incorrectly connected.		

Codes:	A33 / A34	Solutions:
Content:	Bus soft fail / Inv soft fail	• Restart the inverter and wait until it functions normally. • If the error/warning remains, please contact customer service.
Explanation:		
The inverter may be damaged.		

Codes:	A35 / A36
Content:	Bus short / Inv short

Explanation:

The inverter may be damaged.

Solutions:

- Restart the inverter and wait until it functions normally.
- If the error/warning remains, please contact customer service.

Codes:	A37
Content:	Fan fault

Explanation:

Fan fail.

Solutions:

- Check whether the inverter temperature is abnormal.
- Check whether the fan runs properly.(If you can see it)

Codes:	A38
Content:	PV iso low

Explanation:

PV Low insulation impedance.

Solutions:

- Check if the PE line is connected to the inverter and is connected to the ground.
- If the error/warning remains, please contact customer service.

Codes:	A39
Content:	Bus Relay Fault

Explanation:

The inverter may be damaged.

Solutions:

- Restart the inverter and wait until it functions normally.
- If the error/warning remains, please contact customer service.

Codes:	A40
Content:	Grid Relay Fault

Explanation:

The inverter may be damaged.

Solutions:

- Restart the inverter and wait until it functions normally.
- If the error/warning remains, please contact customer service.

Codes:	A41
Content:	EPS Relay fault

Explanation:

The inverter may be damaged.

Solutions:

- Restart the inverter and wait until it functions normally.
- If the error/warning remains, please contact customer service.

Codes:	A42
Content:	Gfci fault

Explanation:

The inverter may be damaged.

Solutions:

- Restart the inverter and wait until it functions normally.
- If the error/warning remains, please contact customer service.

Codes:	A43
Content:	CT Fault

Explanation:

In standby mode, CT senses the current is greater than 5A.

Solutions:

Unrecoverable failure, need to power down the system to troubleshoot the cause of the failure

Codes:	A44
Content:	Reserved

Explanation: Reserved

Solutions:

Reserved

Codes:	A45	Solutions:
Content:	Reserved	
Explanation:Reserved		Reserved

Codes:	A46	Solutions:
Content:	System fault	• Restart the inverter and wait until it functions normally. • If the error/warning remains, please contact customer service.
Explanation: The inverter may be damaged.		

If an error occurs that is not listed in the table, please contact customer service.

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E-VERSION MANUAL

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MEGAREVO

SHENZHEN MEGAREVO TECHNOLOGY CO., LTD.

Building 2,Winlead,Shutianpu Community, Matian Street, Guangming District,
Shenzhen City, Guangdong Province, P.R. China

T: +86 0755 2138 0136 **M**: sales@megarevo.com.cn **WEBSITE**: www.megarevo.com