Inverter/charger

User Manual

KR3522-1250P20C，KRP3522-1250P20C
KR3542-0650P20C，KRP3542-0650P20C
KR5542-1050P20C，KRP5542-1050P20C

EN

Contents

Important Safety Instructions

Please reserve this manual for future review.

This manual contains all the safety, installation, and operation instructions for the KR/KRP-P20C series inverter/charger ("inverter/charger" referred to as this manual).

1. Explanation of symbols

To enable users to use the product efficiently and ensure personal and property safety, please read the related words carefully when you encounter the following symbols in the manual.

Symbol	Definition
Tip	Indicates any practical advice for reference
	**IMPORTANT:** Indicates a critical tip during the operation, if ignored, may cause the device to run in error.
	**CAUTION:** Indicates potential hazards, if not avoided, may cause the device damage.
	**WARNING:** Indicates the danger of electric shock, if not avoided, would cause casualties.
	**WARNING HOT SURFACE:** Indicates the risk of high temperature, if not avoided, would cause scalds.
	Read the user manual carefully before any operation.

 **WARNING:**	The entire system should be installed by professional and technical personnel.

2. Requirements for professional and technical personnel

- Professionally trained.
- Familiar with related safety specifications for the electrical system.
- Read this manual carefully and master related safety cautions.

3. Professional and technical personnel is allowed to do

- Install the inverter/charger to a specified location.
- Conduct trial operations for the inverter/charger.
- Operate and maintain the inverter/charger.

4. Safety cautions before installation

CAUTION	When receiving the inverter/charger, please check if there is any damage in transportation. If you find any problem, please contact the transportation company or our company in time.
CAUTION	• When installing or moving the inverter/charger, follow the instructions in the manual. • When installing the inverter/charger, end-users must evaluate whether the operation area exists arc danger.
WARNING	Keep the inverter/charger out of the reach of children.

5. Safety cautions for mechanical installation

WARNING	• Before installation, confirm the inverter/charger has no electrical connection. • Ensure enough heat dissipation space for the inverter/charger before installation. • Do not install the inverter/charger in humid, salt spray, corrosion, greasy, flammable, explosive, dust accumulative, or other severe environments.

6. Safety cautions for electrical connection

CAUTION	• Check whether wiring connections are tight to avoid the danger of heat accumulation due to loose connections. • The inverter/charger shell shall be connected to the ground. The cross-section of the connection wire should not be less than 4mm^2 • A fast-acting fuse or breaker, whose rated current is twice the inverter/charger rated input current, should be used between the battery and the inverter/charger. • DO NOT put the inverter/charger close to the flooded lead-acid battery because the sparkle in the terminals may ignite the hydrogen released by the battery.
WARNING	• Do NOT connect the inverter/charger to another power source or Utility. Otherwise, the inverter/charger will be damaged. • The AC output terminal is only for the load connection, turn off the inverter/charger when connecting loads. • It is strictly forbidden to connect a transformer or a load with a surge power (VA) exceeding the overload power at the AC output port. Otherwise, damage will be caused to the inverter/charger. • Both the utility input and AC output are of high voltage, do not touch the wiring connection to avoid electric shock.

7. Safety cautions for inverter/charger operation

 **WARNING HOT SURFACE**	When the inverter/charger works, the shell will generate much heat, and the temperature is very high. Please do not touch it, and keep it far from the equipment susceptible to high temperature.
 **CAUTION**	• When the inverter/charger is working, please do not open the inverter/charger cabinet to operate. • When eliminating the fault that affects the safety performance of the inverter/charger or disconnecting the DC input, turn off the inverter/charger switch and operate it after the LCD is completely OFF.

8. The dangerous operations would cause an electric arc, fire, or explosion.

- Touch the wire end that hasn't been insulation treated and may be electriferous.
- Touch the wiring copper row, terminals, or internal devices that may be electriferous.
- The connection of the power cable is loose.
- Screw or other spare parts inadvertently falls into the inverter/charger.
- Improper operations are carried out by untrained non-professional or technical personnel.

 **WARNING**	Once an accident occurs, it must be handled by professional and technical personnel. Improper operations would cause more serious accidents.

9. Safety cautions for stopping the inverter/charger

- First, turn off the AC output and disconnect the utility input breakers. Then, turn off the DC switch.
- After the input and output wires are disconnected for ten minutes, the internal conductive modules can be touched.
- No maintenance parts in the inverter/charger. If maintenance service is required, please get in touch with our after-sales service personnel.

 **WARNING**	Do NOT touch or open the shell after the inverter/charger is powered off within ten minutes.

10. Safety cautions for inverter/charger maintenance

- It is recommended to check the inverter/charger with testing equipment to ensure there is no voltage or current on the terminals and cables.
- When conducting the electrical connection and maintenance, post a temporary warning sign or put up barriers to prevent unrelated personnel from entering the electrical connection or maintenance area.

- Improper maintenance of the inverter/charger may cause personal injury or equipment damage;
- It is recommended to wear an antistatic wrist strap or avoid unnecessary contact with the circuit board.

 **CAUTION**	The safety mark, warning label, and nameplate on the inverter/charger should be visible, not removed or covered.

11. Working temperature

- Working temperature range: -20℃ to +50℃ (when the working temperature exceeds 30℃, the charging power and load power will be reduced appropriately. 100% load output is not supported.)
- Storage temperature range: -25℃ to +60℃ (No sharp temperature changing)
- Relative humidity: < 95% (Non-condensing)
- Altitude:<4000m (If the altitude exceeds 2000 meters, the actual output power is reduced appropriately.)

 **WARNING**	The inverter/charger is strictly prohibited from being used in the following places. And our company shall not be liable for any damage caused by being used in an inappropriate place. • Do not install the inverter/charger in humid, salt spray, corrosion, greasy, flammable, explosive, dust accumulative, or other severe environments. Avoid direct sunlight and rain infiltration when installing it outdoors. • DO NOT install the inverter/charger and flooded lead-acid battery in a sealed space. Otherwise, a fire may cause when the terminals produce sparks, and it ignites the flammable gas released by the battery.

Disclaimers

The warranty does not apply to the following conditions:

- Damage caused by improper use or inappropriate environment (it is forbidden to install the inverter/charger in humid, salt spray, corrosion, greasy, flammable, explosive, dust accumulative, or other severe environments).
- The actual current/voltage/power exceeds the limit value of the inverter/charger.
- Damage caused by working temperature exceeding the rated range.
- Arc, fire, explosion, and other accidents caused by failure to follow the inverter/charger stickers or manual instructions.
- Unauthorized dismantling or attempted repair.
- Damage caused by force majeure.
- Damage occurred during transportation or handling.

1 General Information

1.1 Overview

KR/KRP-P20C series, upgraded Off-Grid inverter/chargers that support utility charging, oil generator charging, solar charging, utility output, inverter output, and energy management. Equipped with main AC output and second AC output. After enabling the low-power mode on the LCD, the inverter/charger can enter the low-power mode according to the battery voltage and output power.

The inverter/charger supports parallel operation for multiple units (12 units in standard application, more than 12 units need to be customized) in single phase and three phase, with 220VAC single phase or 380VAC three phase AC output.

The DSP chip in the product with an advanced control algorithm brings high response speed and conversion efficiency. In addition, this product adopts an industrial design to ensure high reliability and features multiple charging and output modes.

Adopt the Three-stage charging method (Bulk Charging, Constant Charging, and Float Charging) to ensure battery safety.

The 3.5-inches touchable color LCD shows the operational status and full parameters.

The communication interface with the standard Modbus protocol allows end-users to expand their applications and is suitable for different monitoring requirements.

The new optimized MPPT tracking technology can fast-track the PV array's maximum power point in any sunlight conditions and obtain the maximum energy in real time. Two PV input (connect separately or connect in parallel) is supported, which improves the PV utilization.

Adopting the advanced control algorithm, the AC to DC charging process brings the full digital PFC and dual closed-loop voltage-current control. It enables the input power factor close to 1 and improves the control accuracy.

The fully smart digital DC to AC inverting process adopts the advanced SPWM technology, outputs a pure sine wave, and converts the DC power to AC power. It is suitable for household appliances, power tools, industrial equipment, audio systems, and other electronics.

End-users can choose energy sources according to actual needs to maximize solar energy utilization and flexibly take the Utility as a supplement in the hybrid system. This inverter/charger provides high-quality, high-stability, and high-reliability electric energy to the end-users by improving the solar system's power supply efficiency. The inverter/charger with power of 3.5KW, 5.5KW perfectly suits residential applications, Schools, Health Facilities, Government Buildings, Masajid & Worship Places, Cottages and the area

where the electricity is unstable.

Features

- Full intelligent digital energy storage equipment.
- Applicable for pure off grid/ backup power / self-generation and self-consumption situation.
- Support battery mode or non-battery mode.
- Non-battery mode: simultaneously charging with solar (Main) and Utility (Assist).
- Advanced SPWM technology and pure sine wave output, support dual AC output.
- Parallel operation in single phase or three phase for 12 units in standard application, up to 16 units in parallel①.
- Higher PV input current to adapt the higher power solar modules.
- PFC technology reduces the demand on the power grid capacity.
- Advanced MPPT technology, with maximum tracking efficiency higher than 99.5%.
- Some models support two PV inputs to improve PV utilization②.
- Supports charging from multiple types of generators③.
- Battery voltage controls the dry contact to turn on/off the external equipment.
- Battery charging or discharging current limit to compatible with different types of batteries.
- Maximum utility charging current settings to flexibly configure utility charging power.
- Double Sleep mode Battery LVD and Low Output Power.
- With the function of historical data recording④, up to 25000 records. Upon reaching full capacity, the storage chip sectors (4096 records per sector) are cyclically overwritten. The interval for recording historical data is configurable.
- Multiple LED indicators show system status in real-time.
- One-button control of AC output.
- The 3.5-inches touchable color LCD for better status monitoring.
- RS485 communication interface with optional WiFi, Bluetooth, TCP, or 4G modules for remote monitoring.
- With a built-in WiFi module, and the inverter/charger can be remotely monitored through the APP.
- Three-stage charging method to ensure battery safety.
- Lithium battery communication port to perform the safe charging and discharging.

- Comprehensive electronic protection.
- Anti-reverse connection protection for the battery input and PV input
- -20℃ to +50℃ operating temperature range to meets more environment requirements.
- IP20 enclosure design with Anti-Dust Kit (Dust removal is required regularly, and the specific requirements are detailed in chapter 7 Maintenance).

①More than 12 units connected in parallel, please contact your business personnel for customization.

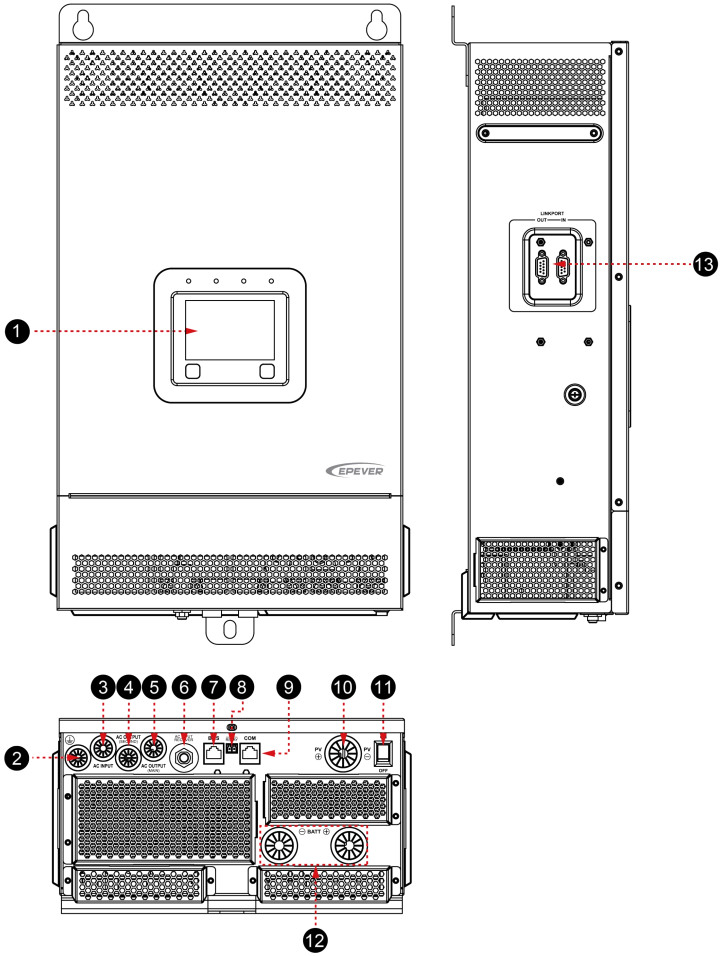
②Only the KR5542-1050P20C and KRP5542-1050P20C support this function, which realizes single MPPT tracking or two parallel MPPTs tracking, and increase the PV maximum input current. When two PV arrays are independently input, set the "PVMode" as "Single." When two PV arrays connected in parallel to one access to the inverter/charger (the PV terminals of the inverter/charger need to be paralleled externally), set the "PVMode" as "Parallel." When there is only one PV array, set the "PVMode" as "Single" (The "Parallel" mode is invalid).

③When connecting a non-inverter generator, the charging current maybe cannot reach the rated power. It is recommended to connect an inverter generator. And when using the generator, the “ACmode” needs to be set to the “Oil.” For specific setting, refer to chapter 2.5.1 Parameters list > 5. System (System parameter setting).

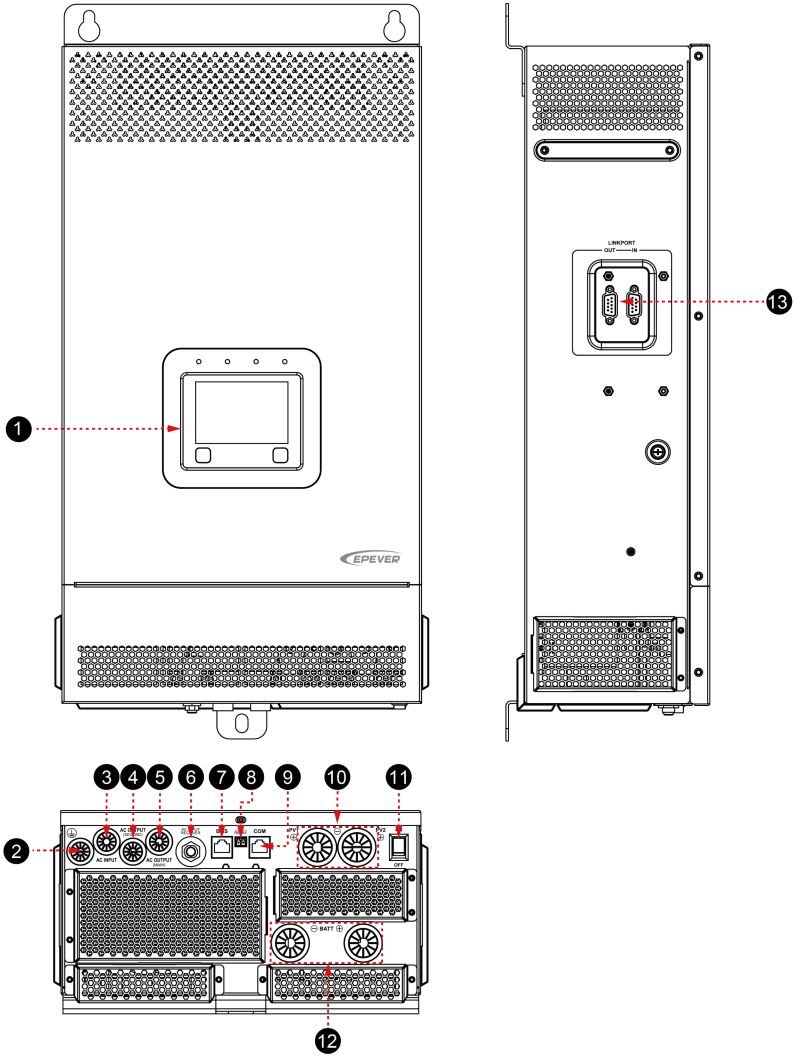
④The contents of each historical record include: Year, Month, Day, Hour, Minutes, Seconds, PV Maximum Voltage(V), PV Power(W), Utility Voltage(V), Utility Current(A), Utility Frequency(Hz), Utility Power(W), Load Voltage(V), Load Current(A), Load Power(W), Inverter Frequency(Hz), Battery Voltage(V), Battery Current(A), Battery SOC(%), Battery Temperature (℃), Boost Module Temperature(℃), INV Module Temperature(℃), Maximum BAT Volt(V), Minimum BAT Volt(V).

1.2 Appearance

- **KR3522-1250P20C/KRP3522-1250P20C/KR3542-0650P20C/KRP3542-0650P20C**

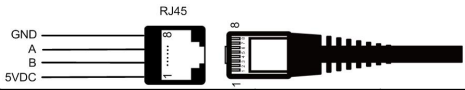


- **KR5542-1050P20C/KRP5542-1050P20C**



No.	Instruction	No.	Instruction
❶	Color LCD (see chapter 2)	❽	Dry contact interface(2)
❷	Grounding terminal	❾	RS485 port (RJ45, with isolation design)(3) 5VDC/200mA
❸	AC input port	❿	PV terminals
❹	AC output second load interface	⓫	Power switch
❺	AC output main load interface	⓬	Battery terminals
❻	Utility over-current protector	⓭	Parallel connection interface(4)
❼	BMS port (RJ45, with isolation design)(1)		

(1) This inverter/charger integrates a BMS-Link module. Connect the lithium battery to the BMS communication port directly, and set the BMS protocol number, the BMS protocols of different lithium battery manufacturers can be converted into our company's standard ones, which can realize the communication between the inverter/charger and the BMS of other manufacturers. Pin definition for the BMS port (RJ45):



Pin	Definition	Pin	Definition
1	+5VDC	5	RS485-A
2	+5VDC	6	RS485-A
3	RS485-B	7	GND
4	RS485-B	8	GND

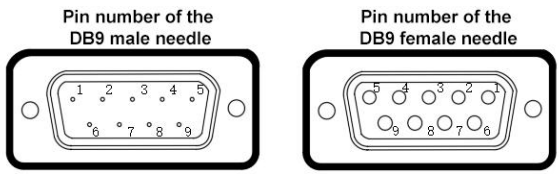
Tip	Please go to EPEVER official website to check or download the currently supported BMS manufacturers and the BMS parameters.

(2) Dry contact specification: 1A@125VAC.

Function: The dry contact interface is connected with the generator switch to turn on/off the generator.

(3) Connecting with the RS485 port, an optional WiFi, Bluetooth, TCP, or 4G module can remote control the inverter/charger. Pin definition for the RS485 port is the same as the BMS port, see description in above section (1).

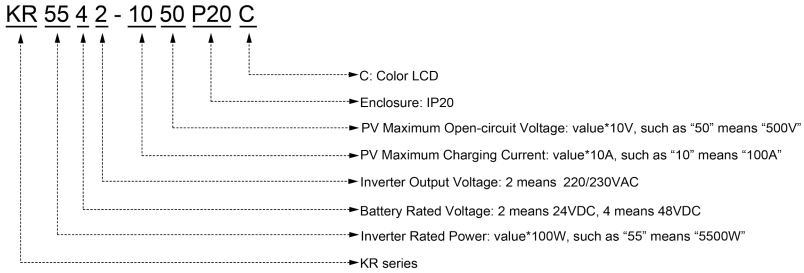
(4) Pin definition for the parallel connection interface:



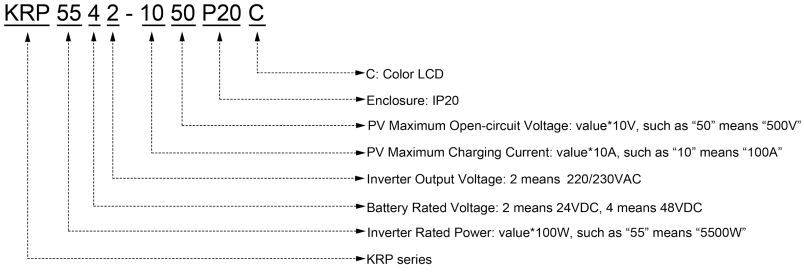
Pin	Definition	Pin	Definition
1	HFS-BUS	4	CAN-L
2	PFS-BUS	5	CAN-H
3	PS-GND	6/7/8/9	Reserved

1.3 Naming rules

- **Naming rules for KR-P20C series**

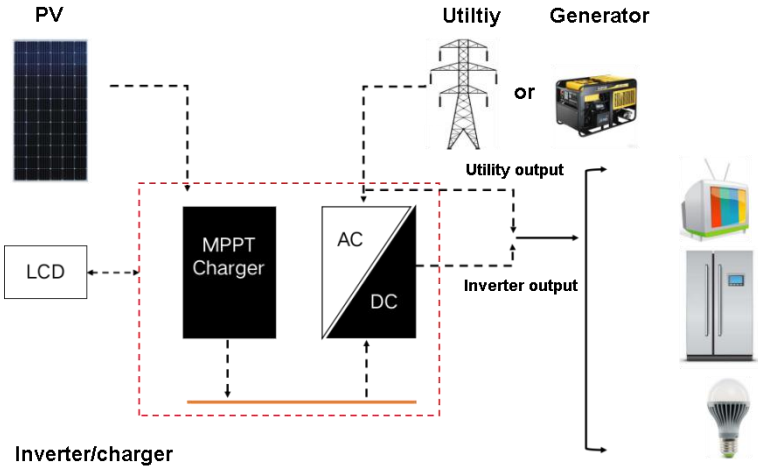


- **Naming rules for KRP-P20C series**

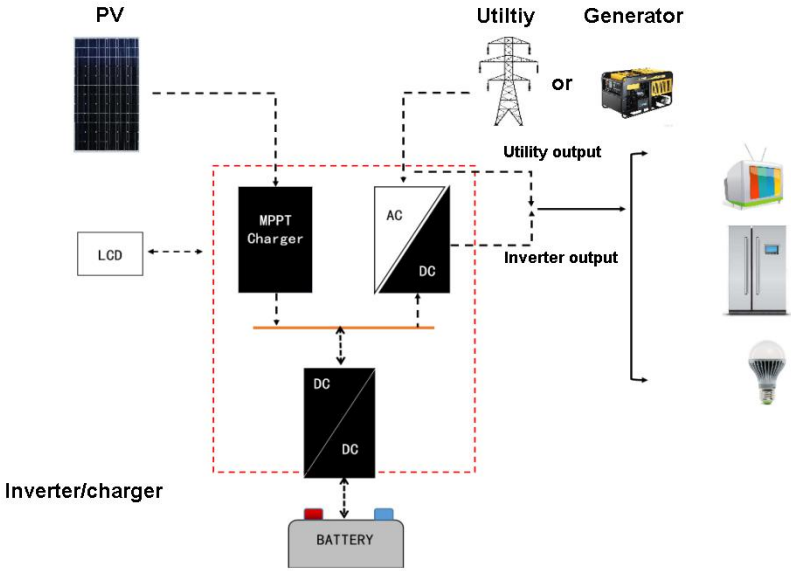


1.4 Connection diagram

- **No battery mode**



- **Battery mode**



WARNING	AC loads shall be determined according to the output power of the inverter/charger. The load exceeding the maximum output power may damage the inverter/charger.
CAUTION	• For different battery types, confirm the relevant parameters before power on. • There are various types of oil generators with complex output conditions. It is recommended to use the inverter oil generator. If non-inverter oil generators are used, they must be tested in practice before use.

2 Interface

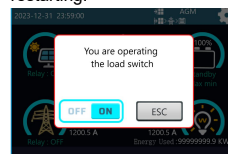
Note: The display screen can be viewed clearly when the angle between the end-user's horizontal sight and the display screen is within 90°. If the angle exceeds 90°, the information on the display screen cannot be viewed clearly.

2.1 Indicator

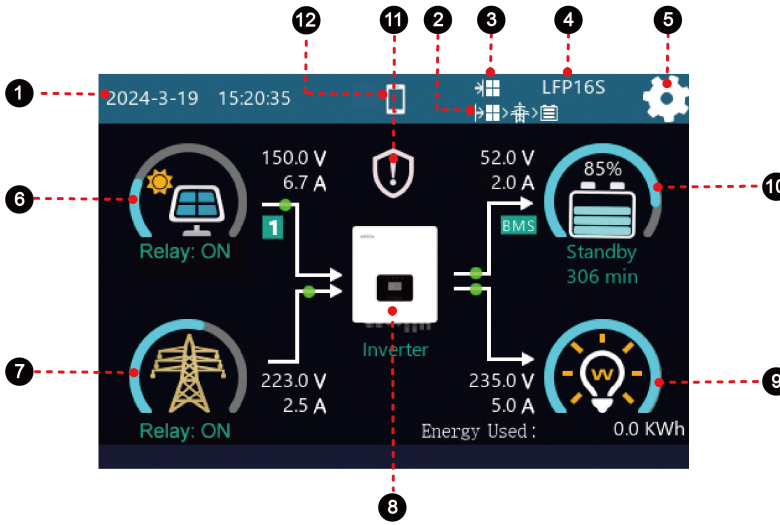
Indicator	Status	Instruction
PV	OFF	No PV input
	Green ON	PV normal
	Red ON	PV charging fault (PV1/PV2 over voltage)
LOAD	OFF	No inverter output
	Green ON	Inverter, charging, and bypass are normal
	Red ON	Inverter fault (inverter over current/over voltage/under voltage, output short-circuit, and over load)
GRID	OFF	No utility input
	Green ON	Utility normal
	Green flashing (0.5Hz)	Oil generator charging
	Red ON	Utility charging fault (Utility over voltage/ over current/under voltage/frequency abnormal)

RUN	Green flashing (0.5Hz)	Normal communication
	Red ON	Communication fault

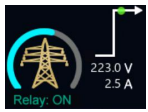
2.2 Buttons

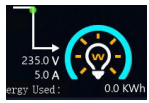
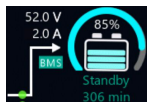
Buttons	Operation	Instruction
	Click	Exit the current interface and return to home screen.
	Click	Turn ON/OFF the load switch. Short press this button to pop up the following prompt message. Click ON/OFF to turn on/off the load switch. If set to "OFF", it will automatically return to "ON" after restarting. 

2.3 Home screen



No.	Instruction	
❶		Display the system time. Please set the system time correctly before use.
❷		Displays the battery discharge mode. For specific parameter settings, see 2.5.1 Parameter list > 5. System (System parameter setting).  PV > BP > BT  PV > BT > BP  BP > PV > BT
❸		Displays the battery charge mode. For specific parameter settings, see 2.5.1 Parameter list > 5. System (System parameter setting).  Solar  Solar > Grid  Solar + Grid  Grid > Solar
❹		Displays the current battery type. For specific parameter settings, see 2.5.1 Parameter list > 5. System (System parameter setting).
❺		Parameter setting icon, click to enter the password input screen, and you can customize the system parameters after entering the password correctly, see 2.5 Parameter settings for specific operations.
❻		• Display PV input voltage, PV input current. • The direction of the arrow shows the energy flow state of the PV input (the number icon 1 or 2 on the line represents the current status of corresponding PV module 1 or 2). • The arc  represents the percentage of the current PV generation power to the rated PV power generation. • Display whether the PV module is working:  indicates that the PV module is working normally,  indicates that the PV module is not working). • Display whether the MPPT of the current PV is working: "Relay: ON" means it is working normally, "Relay: OFF" means it is not working.

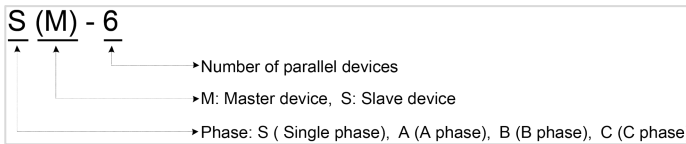
		Click the PV icon to enter the PV real-time data screen, see 2.4.1 PV real-time data for details.
❼		● Display utility input voltage and utility input current. ● The direction of the arrow shows the energy flow state of the utility input. ● The arc  represents the percentage of (current utility consumption power/ On-Grid power) to rated AC output power. ● Display whether the utility is working normally:  indicates that the utility is working normally,  indicates that the utility is not working. ● Display the utility relay status: "Relay: ON" means the utility relay is connected, "Relay: OFF" means the utility relay is disconnected. Click the utility icon to enter the utility real-time data. For specific operations, see 2.4.2 Utility real-time data.
❽		● Display the inverter/charger working status: "Inverter" indicates the inverter working status, "Grid" indicates the utility charging/ utility bypass and grid working status). ● Display the parallel status icon (it will be displayed when there are more than 2 inverter/chargers with successful parallel communication, and will not be displayed on a single inverter/charger). ★ Click the inverter/charger icon to enter the inverter/charger information screen. For specific operations, see 2.4.3 Inverter/charger real-time data.

❾		• Display the output voltage and output current of the load. • The arrow direction indicates the energy flow state of the load. • The arc  represents the percentage of the current load power to the rated load power. • Display the load status:  indicates that the load is on,  indicates that the load is off. • "Energy Used" indicates the total power consumption of the load (that is, the cumulative power consumption of the load since the inverter/charger was first turned on. If the data is cleared, it will be counted again) Click the load icon to enter the load real-time screen. For specific operations, see 2.4.4 Load real-time data.
❿		• Display the battery voltage and current in charging and discharging state. • The arrow direction indicates the energy flow direction of the battery. • Display the working status of the battery:  indicates that the battery is charging and discharging normally,  indicates that working in battery-free mode. • BMS indicates that the BMS communication is normal, BMS indicates that BMS fault occurs. If the BMS communication is abnormal or the BMS is not connected, this icon is not displayed, and the "BMS communication abnormal" fault is displayed. • Display battery SOC percentage value. • The arc  represents the battery SOC percentage. • Display charging status: "Standby, Equalizing, Floating, and Boosting". • Display time: If it is charging or the remaining available discharging time is greater than 999 minutes, **MAX** is displayed. If the remaining available discharging time is less than or equal to 999 minutes, the specific number of minutes is displayed. Click the battery icon to enter the battery real-time screen. For specific operations, see 2.4.5 Battery real-time data.
⓫		Indicates that the current system is fault-free.

		Indicates that a fault has occurred in the current system. Click this icon to view real-time fault. For specific operations, see 2.4.6 Real-time error code.
⑫		Indicate turning on the 5V power supply of the inverter/charger's COM port, which can be connected to an external Bluetooth or WiFi module.

Note: When PV or utility is charging, the battery will be balanced by default at 06:00 on the 28th of each month (the date can be modified).

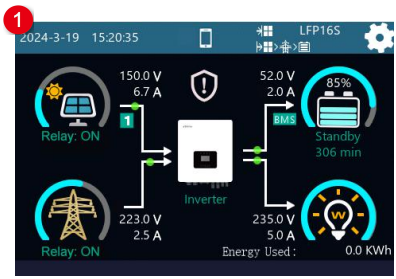
★ Parallel status icon name rule:

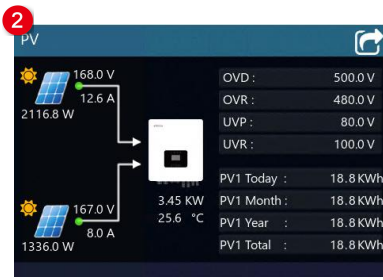


Note: The master and slave units are randomly defined.

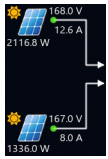
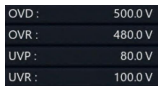
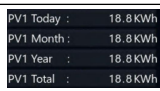
2.4 Real-time data

2.4.1 PV real-time data

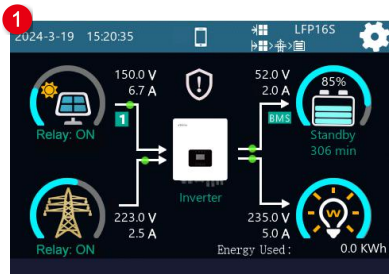




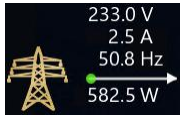
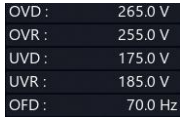
On the home screen, touch  to enter the PV real-time data screen, the information displayed is as follows:

Icon	Instruction
	1. PV input voltage, PV input current 2. PV energy flow indication 3. PV real-time power Note: If there is only one PV input, only one PV icon will be displayed here.
	1. Total PV generation (not displayed if there is only one PV input) 2. PV module temperature (temperature sampling by the PV internal heat sink (DC/DC heat sink)
	Swipe up and down in this area to view all the settable parameters of the PV module. 1. Refer to "2.5.1 Parameter list > 1.PV (PV parameter setting)" to view the default values and setting range of the PV module.
	To slide up and down in this area to view the daily, monthly, annual and total power generation statistics of the PV module.

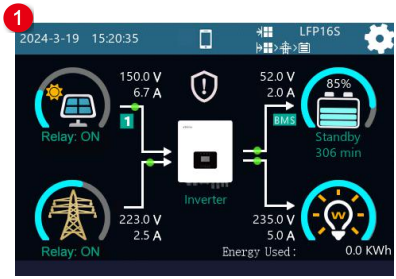
2.4.2 Utility real-time data



On the home screen, touch  to enter the utility real-time data screen. The information displayed is as follows:

Icon	Instruction
	1. Utility input voltage, current, frequency 2. Utility energy flow instructions 3. Utility consumption power
	Swipe up and down in this area to see all the settings of the utility. Refer to "2.5.1 Parameter list > 3. Grid (Grid parameter setting)" to view the default values and setting range of all utility parameters.
	Display the daily, monthly, yearly, and total electricity consumption statistics of the utility.

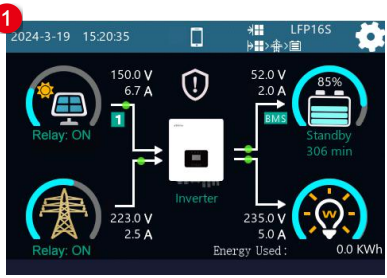
2.4.3 Inverter/charger real-time data

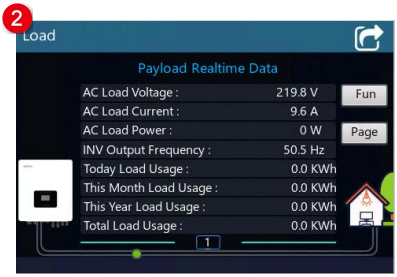


On the home screen, touch  to enter the inverter/charger real-time data screen, and the interface will display the current product series, product model, SN, LCD PCB version, LCD firmware version and other product information.

Click  /  to show other parameters.

2.4.4 Load real-time data



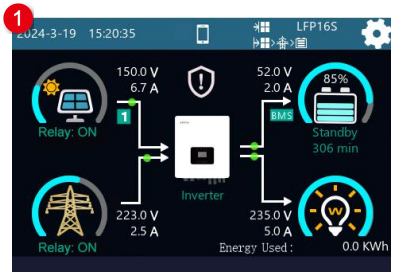


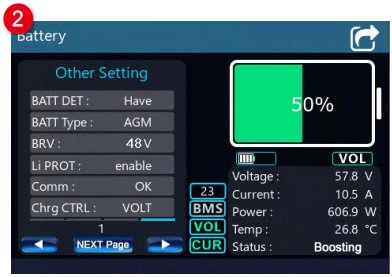
On the home screen, touch  to enter the load real-time data screen.

Click ***Fun*** to display the Payload Real-time Data, Setting Parameters To Display page, and Parallel Real-Time Data page.

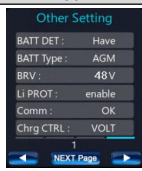
Click ***Page*** to display all the information for the current page.

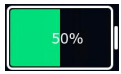
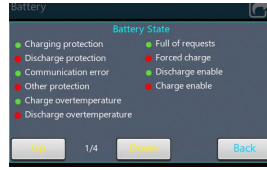
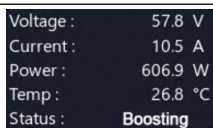
2.4.5 Battery real-time data



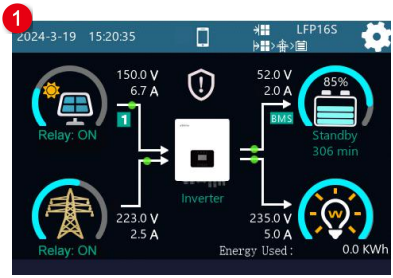


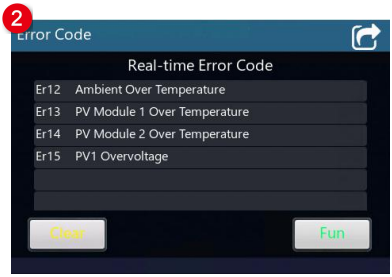
On the home screen, touch  to enter the battery real-time data screen. The information displayed is as follows:

Icon	Instruction
	1. Click ◄ / ► to display Other Setting, BMS Data, Voltage Setting, and SOC Setting. 2.Click ***NEXT Page*** to shows all the information for the current page.

	To display the SOC value of the battery, click this icon to display the following BMS State screen, see Battery state instruction in Appendix 2 for details.  Click ***Up*** / ***Down*** to display other page, and click ***Back*** to return to the battery real-time data screen.
	1. Indicate whether the currently battery protocol supports high current.  Indicates that the battery protocol does not support high current.  Indicates that the protocol supports high current. 2. Indicates the setting value of "BCCMode." VOL Indicates that "BCCMode" is set to "VOL." SOC Indicates that "BCCMode" is set to "SOC."
	Displays real-time data of the battery: voltage, current, power, battery temperature, charging state.
	1. The number 23 indicates the currently battery protocol. 2. BMS indicates the set value of "BMS (BMS Enable)," gray indicates disable, and green indicates enable. 3. VOL indicates the setting value of "BMSVolt (BMS Voltage Control)," gray indicates disable, and green indicates enable. 4. CUR indicates the setting value of "BMSCurr (BMS Current Control)," gray indicates that the parameter is set to "Invalid", green indicates that the parameter is set to "BMS."

2.4.6 Real-time error code





If there is no fault in the current system,  will be displayed on the home screen.

If there is a fault in the current system,  will be displayed on the home screen. Touch this icon to enter the real-time error code screen.

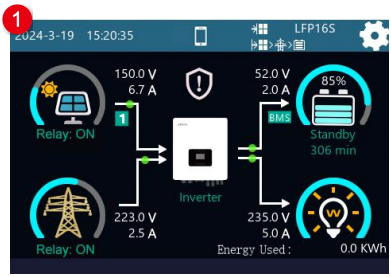
Click ***Fun*** to display "Real-time Error Code, Historical Error Code" in order.

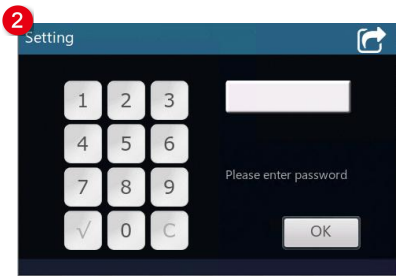
Click ***Clear*** to clear the current fault list (the fault information will be cleared only after the system fault is cleared; otherwise, the real-time fault list will not be cleared).

If there are ***Up*** and ***Down*** on the current page, click the button to display the previous page and next page.

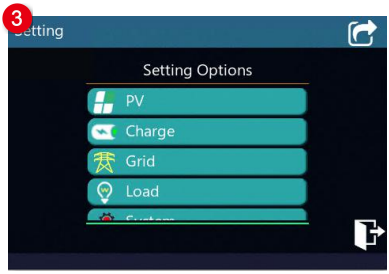
2.5 Parameters setting

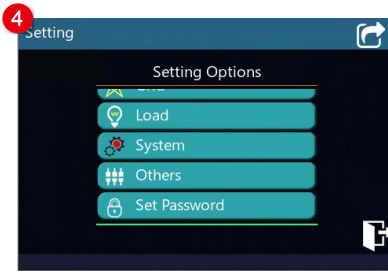
2.5.1 Parameters list





1. On the home screen, click  in the upper-right corner.	2. Enter the password input screen, enter the correct password (the initial password is 000000 by default), and click OK or √ to enter the parameter setting screen.





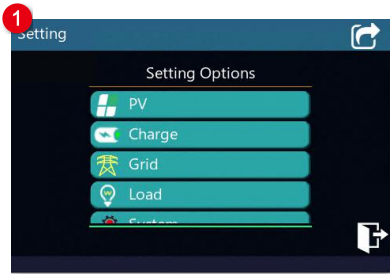
The parameter setting screen includes: PV (PV parameter setting), Charge (battery charge control parameter setting), Grid (Grid parameter setting), Load (Load parameter setting), System (System parameter setting), Others (Other parameters setting) and password setting.

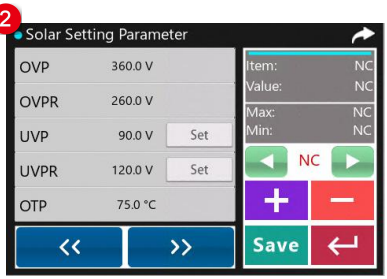
On the current screen, swipe up and down to select the parameter item to be set, and click it to enter the parameter setting screen.

Click  to exit the current screen and return to the home screen (after exiting in this way, if you enter the parameter setting screen again within 5 minutes, you do not need to enter the password; if it exceeds 5 minutes, you need to re-enter the password).

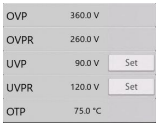
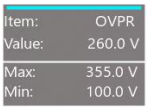
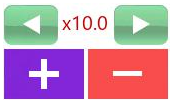
Click  to safety exit the current screen to return to the home screen (after exiting in this way, you will need to re-enter the password to enter the parameter setting screen).

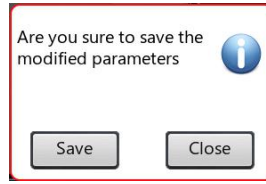
1. PV (PV parameter setting)





On the parameter setting screen, click ***PV*** to enter the PV parameter setting screen. The following information is displayed:

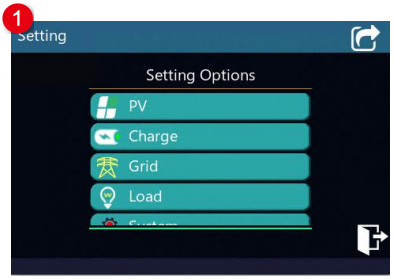
Icon	Instruction
	Default values and settable ranges of PV parameters. Swipe up and down to view all the parameters on the current page. Set indicates that the parameter value can be customized (If the parameter is read-only, there is no Set icon).
	Click to display the interface that can be set in addition to the current screen (Note: The PV configurable parameters are only on the current screen, and clicking the button does not respond.)
	Click Set button to display the parameter name, default value, maximum value and minimum value that can be set.
	x10.0 indicates the times of step size, which can be selected as 0.1 times, 0.5 times, 1 times, and 10 times. After the times of step size is set, click this button + − to increase or decrease the current parameter.
	After the parameter setting is complete, click ↵ to confirm the set value. After all the parameters on the current page are set, click Save to issue new parameter value, and the following message box will pop up:

	 Click ***Save*** to complete the parameter issue.

- **Default value and setting range for PV parameters as shown in the below:**

Parameter	Default	User define
Solar Setting Parameter		
OVP (Over Voltage Protection Voltage)	500.0V	Read-only
OVPR (Over Voltage Protection Reconnect Voltage)	480.0V	Read-only
UVP (Under Voltage Protection Voltage)	80.0V	User define: 80.0V to (Under Voltage Protection Reconnect Voltage minus 5V), step size: 0.1V
UVPR (Under Voltage Protection Reconnect Voltage)	100.0V	User define: 100.0V to 200.0V, or (Under Voltage Protection Voltage plus 5V) to 200.0V, step size: 0.1V Note: Take the maximum value between 100.0V and (Under Voltage Protection Voltage plus 5V).
OTP (Over Temperature Protection Temperature)	75.0℃	Read-only. PV Over Temperature Protection Temperature for KR5542-1050P20C/KRP5542-1050P20C.
	70.0℃	Read-only. PV Over Temperature Protection Temperature for KR3522-1250P20C/KRP3522-1250P20C/ KR3542-0650P20C/KRP3542-0650P20C.
OTPR (Over Temperature Protection Reconnect Temperature)	70.0℃	Read-only. PV Over Temperature Protection Reconnect Temperature for KR5542-1050P20C/ KRP5542-1050P20C.
	65.0℃	Read-only. PV Over Temperature Protection Reconnect Temperature for KR3522-1250P20C/ KRP3522-1250P20C/KR3542-0650P20C/ KRP3542-0650P20C.

2. Charge (Battery charge control parameter setting)



On the parameter setting screen, click ***Charge*** to enter the battery charge control parameter setting screen. The following information is displayed:

Icon	Instruction
	Default values and settable ranges for battery voltage/SOC control parameters. Swipe up and down to view all the parameters on the current page. Set indicates that the parameter value can be customized (If the parameter is read-only, there is no Set icon).
<< >>	Click to display the screen of Voltage Control Strategy and SOC Control Strategy.

Note: For the content and operation methods of the parameter setting area on the right, please refer to the introduction of "1. PV (PV parameter setting)."

- **Default value and setting range for battery charge control parameters as shown in the below:**

Parameter	Default	User define
2.1 Voltage Control Strategy		
OVD (Over Voltage Disconnect Voltage)	64.0V (48V system) 32.0V (24V system)	User define: (Over Voltage Reconnect Voltage plus 0.1*N) ≤ Over Voltage Disconnect Voltage ≤ 16*N, step size: 0.1V. Note: N=Rated battery voltage/12.
CLV (Charging Limit Voltage)	60.0V (48V system) 30.0V (24V system)	User define: Equalize Charging Voltage < Charging Limit Voltage < Over Voltage Disconnect Voltage, step size: 0.1V

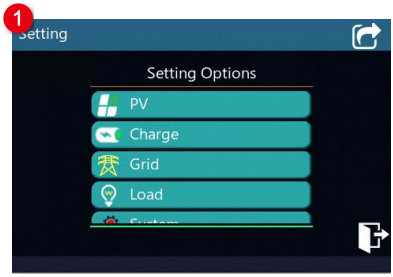
Parameter	Default	User define
OVR (Over Voltage Reconnect Voltage)	60.0V (48V system) 30.0V (24V system)	User define: (Discharging Limit Voltage plus 0.15*N) ≤ Over Voltage Reconnect Voltage ≤ (Over Voltage Disconnect Voltage minus 0.1*N), step size: 0.1V. Note: N=Rated battery voltage/12.
ECV (Equalize Charging Voltage)	58.4V (48V system) 29.2V (24V system)	User define: Boost Charging Voltage ≤ Equalize Charging Voltage < Charging Limit Voltage, step size: 0.1V
BCV (Boost Charging Voltage)	57.6V (48V system) 28.8V (24V system)	User define: Float Charging Voltage ≤ Boost Charging Voltage ≤ Equalize Charging Voltage, step size: 0.1V
FCV (Float Charging Voltage)	55.2V (48V system) 27.6V (24V system)	User define: Boost Voltage Reconnect Voltage < Float Charging Voltage ≤ Boost Charging Voltage, step size: 0.1V
BVR (Boost Voltage Reconnect Voltage)	52.8V (48V system) 26.4V (24V system)	User define: Low Voltage Reconnect Voltage < Boost Voltage Reconnect Voltage < Float Charging Voltage, step size: 0.1V
LVR (Low Voltage Reconnect Voltage)	50.0V (48V system) 25.0V (24V system)	User define: Low Voltage Disconnect Voltage < Low Voltage Reconnect Voltage < Boost Voltage Reconnect Voltage, step size: 0.1V Note: This voltage is also the recovery voltage for the AC output main power-off and second power-off. The relays of the AC output main power-off and second power-off are connected again after the battery voltage rises to this voltage.
UVWR (Under Voltage Warning Reconnect Voltage)	48.8V (48V system) 24.4V (24V system)	User define: (Under Voltage Warning Voltage plus 0.1*N) ≤ Under Voltage Warning Reconnect Voltage ≤ (Over Voltage Reconnect Voltage minus 0.1*N), step size: 0.1V Note: N=Rated battery voltage/12.

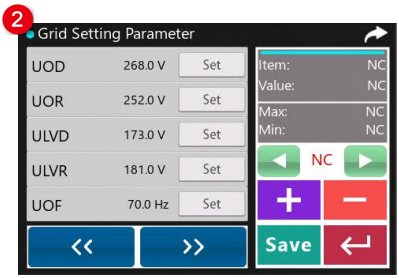
Parameter	Default	User define
UVW (Under Voltage Warning Voltage)	48.0V (48V system) 24.0V (24V system)	User define: (Discharging Limit Voltage plus 0.1*N) ≤ Under Voltage Warning Voltage ≤ (Under Voltage Warning Reconnect Voltage minus 0.1*N), step size: 0.1V Note: N=Rated battery voltage/12. This voltage is also the disconnect voltage for the AC output main power-off. The relay of the AC output main power-off is disconnected after the battery voltage drops to this voltage.
LVD (Low Voltage Disconnect Voltage)	43.2V (48V system) 21.6V (24V system)	User define: Discharging Limit Voltage＜ Low Voltage Disconnect Voltage< Low Voltage Reconnect Voltage, step size: 0.1V Note: This voltage is also the disconnect voltage for the AC output second power-off. The relay of the AC output second power-off is disconnected after the battery voltage drops to this voltage.
DLV (Discharging Limit Voltage)	40.7V (48V system) 20.3V (24V system)	Read-only
AUX OFF (Auxiliary module OFF voltage)	56.0V (48V system) 28.0V (24V system)	Under the charging mode of "Solar > Grid," the utility will stop charging the battery if the battery voltage exceeds this value. User define: (Auxiliary module ON voltage plus 0.2*N) ≤ Auxiliary module OFF voltage ≤ Charging Limit Voltage (N=Rated battery voltage/12)
AUX ON (Auxiliary module ON voltage)	51.0V (48V system) 25.5V (24V system)	Under the charging mode of "Solar > Grid," the utility will stop charging the battery if the battery voltage exceeds this value. User define: (Auxiliary module ON voltage plus 0.2*N) ≤ Auxiliary module OFF voltage ≤ Charging Limit Voltage (N=Rated battery voltage/12)

Parameter	Default	User define
2.2 SOC Control Strategy		
FCP (Full Charging Protection SOC)	100%	It takes effect after the “BCCMode” is set as “SOC.” When the battery SOC is higher than or equals to this value, the inverter/charger will stop charging the battery. User define: (Full Charging Protection Reconnect SOC plus 5%) to 100%, or 80% to 100%, step size: 1% Note: Take the maximum value between (Full Charging Protection Reconnect SOC plus 5%) and 80%.
FCPR (Full Charging Protection Reconnect SOC)	95%	It takes effect after the “BCCMode” is set as “SOC.” When the battery SOC is lower than this value, the inverter/charger will charge the battery. User define: 60% to (Full Charging Protection SOC minus 5%), step size: 1%
LPAR (Low Power Alarm Reconnect SOC)	40%	It takes effect after the “BCCMode” is set as “SOC.” It cannot be set separately (equals the "Discharging Protection Reconnect SOC").
LPA (Low Power Alarm SOC)	25%	It takes effect after the “BCCMode” is set as “SOC.” User define: 10% to 35%, or 10% to (Discharging Protection Reconnect SOC minus 5%), step size: 1% Note: Take the minimum value between (Discharging Protection Reconnect SOC minus 5%) and 35%.
DPR (Discharging Protection Reconnect SOC)	40%	It takes effect after the “BCCMode” is set as “SOC.” User define: (Discharging Protection SOC plus 5%) to 60%, or 20% to 60%, step size: 1% Note: Take the maximum value between (Discharging Protection SOC plus 5%) and 20%.
DP (Discharging Protection SOC)	10%	It takes effect after the “BCCMode” is set as “SOC.” When the battery SOC is lower than this value, the battery will stop discharging. User define: 0 to 30%, or 0 to (Discharging Protection Reconnect SOC minus 5%), step size: 1% Note: Take the minimum value between (Discharging Protection Reconnect SOC minus 5%) and 30%.

Parameter	Default	User define
UAC ON (Utility Charging ON SOC)	30%	It takes effect after the “BCCMode” is set as “SOC.” User define: 20% to 50%, or 20% to (Utility Charging OFF SOC minus 10%), step size: 1% Note: Take the minimum value between 50% and (Utility Charging OFF SOC minus 10%).
UAC OFF (Utility Charging OFF SOC)	60%	It takes effect after the “BCCMode” is set as “SOC.” User define: (Utility Charging ON SOC plus 10%) to 100%, or 40% to 100%, step size: 1% Note: Take the maximum value between (Utility Charging ON SOC plus 10%) and 40%.
Set SOC	45%	Read-only. When the BMS is valid and the communication is normal, the real-time SOC value is automatically uploaded to the inverter/charger.

3. Grid (Grid parameter setting)





On the parameter setting screen, click ***Grid*** to enter the grid parameter setting scree. The following information is displayed:

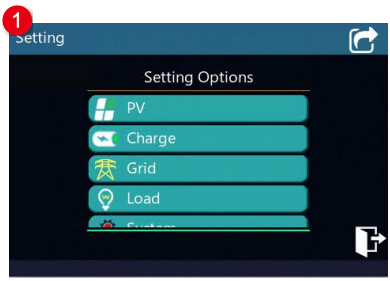
Icon	Instruction
	Default values and settable ranges for grid setting parameters. Swipe up and down to view all the parameters on the current page. Set indicates that the parameter value can be customized (If the parameter is read-only, there is no Set icon).
	Click to display the interface that can be set in addition to the current screen (Note: The Grid configurable parameters are only for the current screen, and there is no response when you click the button.)

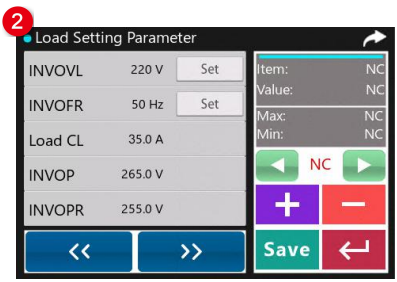
Note: For the content and operation methods of the parameter setting area on the right, please refer to the introduction of "1. PV (PV parameter setting)."

- **Default value and setting range for Grid parameters as shown in the below:**

Parameter	Default	User define
3.1 Grid Setting Parameter		
UOD (Utility Over Voltage Disconnect Voltage)	265.0V	User define: (Utility Over Voltage Reconnect Voltage plus 10V) to 285.0V, step size: 0.1V
UOR (Utility Over Voltage Reconnect Voltage)	255.0V	User define: 220.0V to (Utility Over Voltage Disconnect Voltage minus 10V), step size: 0.1V
ULVD (Utility Low Voltage Disconnect Voltage)	175.0V	User define: 90.0V to (Utility Low Voltage Reconnect Voltage minus 10V), step size: 0.1V
ULVR (Utility Low Voltage Reconnect Voltage)	185.0V	User define: (Utility Low Voltage Disconnect Voltage plus 10V) to 220.0V, step size: 0.1V
UOF (Utility Over Frequency Disconnect Frequency)	70.0Hz	In the bypass state, when the actual utility input frequency is higher than this value, the inverter/charger will be switched to the inverter output state. User define: 52.0Hz to 70.0Hz, or (Utility Under Frequency Disconnect Frequency plus 0.5Hz) to 70.0Hz, step size: 0.1Hz. Note: Take the maximum value between 52.0Hz and (Utility Under Frequency Disconnect Frequency plus 0.5Hz).
UFD (Utility Under Frequency Disconnect Frequency)	40.0Hz	In the bypass state, when the actual utility input frequency is lower than this value, the inverter/charger will be switched to the inverter output state. User define: 40.0Hz to 58.0Hz, or 40.0Hz to (Utility Over Frequency Disconnect Frequency minus 0.5Hz), step size: 0.1Hz. Note: Take the minimum value between 58.0Hz and (Utility Over Frequency Disconnect Frequency minus 0.5Hz).

4. Load (Load parameter setting)





On the parameter setting screen, click ***Load*** to enter the load parameter setting screen. The following information is displayed:

Icon	Instruction
	Default values and settable ranges for load setting parameters. Swipe up and down to view all the parameters on the current page. Set indicates that the parameter value can be customized (If the parameter is read-only, there is no Set icon).
	Click to display the interface that can be set in addition to the current screen (Note:The load configurable parameters are only for the current screen, and there is no response when you click the button.)

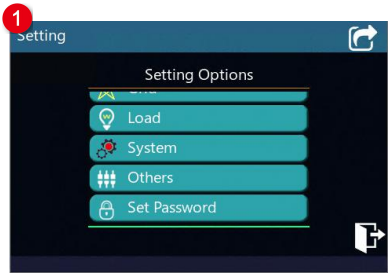
Note: For the content and operation methods of the parameter setting area on the right, please refer to the introduction of "1. PV (PV parameter setting)."

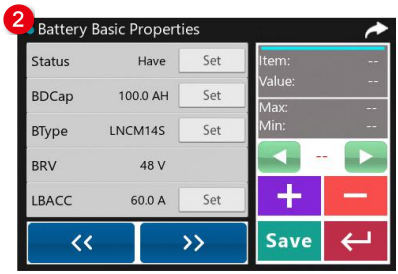
- **Default value and setting range for load parameters as shown in the below:**

Parameter	Default	User define
4. 1 Load Setting Parameter		
INVOVL (Inverter Output Voltage Level)	220V	User define: 220V/230V
INVOFR (Inverter Output Frequency Range)	50Hz	User define: 50Hz / 60Hz Note: When the Utility power is connected and the Utility frequency is detected, the output frequency will be in accordance with the Utility frequency in the Utility bypass mode. For single inverter/charger, it will take effect immediately after the "INVOFR" is changed. For the parallel connection, you must shut down the inverter/charger for 10s and then restart it for the modification to take effect (Enter into the "Load Setting Parameter" screen again to check if the change has been changed).
Load CL (Load Current Limit)	35.0A	Read-only. Load Current Limit for KR3522-1250P20C/KRP3522-1250P20C/ KR3542-0650P20C/KRP3542-0650P20C.
	42.0A	Read-only. Load Current Limit for KR5542-1050P20C/KRP5542-1050P20C.
INVOP (Inverter Over Voltage Protection Voltage)	265.0V	Read-only

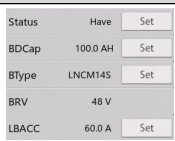
Parameter	Default	User define
INVOPR (Inverter Over Voltage Protection Recovery Voltage)	255.0V	Read-only
TempUL (Temperature Upper Limit)	75.0℃	Read-only. Temperature Upper Limit for KR5542-1050P20C/KRP5542-1050P20C.
	70.0℃	Read-only. Temperature Upper Limit for KR3522-1250P20C/KRP3522-1250P20C/KR3542-0650P20C/ KRP3542-0650P20C.
TempULR (Temperature Upper Limit Recovery)	70.0℃	Read-only. Temperature Upper Limit Recovery for KR5542-1050P20C/KRP5542-1050P20C.
	65.0℃	Read-only. Temperature Upper Limit Recovery for KR3522-1250P20C/KRP3522-1250P20C/ KR3542-0650P20C/KRP3542-0650P20C.

5. System (System parameter setting)





On the parameter setting screen, click ***System*** to enter the system parameter setting screen. The following information is displayed:

Icon	Instruction
	Default values and settable ranges for system setting parameters. Swipe up and down to see all the parameters on the current page. Set indicates that the parameter value can be customized (If the parameter is read-only, there is no Set icon).
	Click to display the setting screen of “Battery Basic Properties, Advanced Battery Properties, Charge and Discharge Management, System Time Setting, and Local Parameters.”

	Option-based parameter setting method: Click + − to switch options, and a green dot flashes in front of the parameter to indicate that the current parameter is selected. Click ↵ to confirm, and click Save to issue new parameter value. For details on setting numerical parameters, refer to the introduction of "1. PV (PV parameter setting)."

- **Default value and setting range for system parameters as shown in the below:**

Parameter	Default	User define
5.1 Battery Basic Properties		
Status (Battery Status)	Have	User define: Have, NO Note: When the parameter value is changed (i.e., the value is changed from "Have" to "NO", or from "NO" to "Have"), the AC output will be cut off for about 3 seconds before resuming normal output.
BDCap (Battery Design Capacity)	100.0 AH	User define: 10.0AH to 2400.0AH, step size: 0.1AH
BType (Battery Type)	AGM	**48V battery type:** AGM, OPZS, GEL, FLD, LFP15S, LFP16S, LNCM13S, LNCM14S
		24V battery type: AGM, OPZS, GEL, FLD, LFP8S, LNCM6S, LNCM7S
BRV (Battery Voltage)	48 V	Read-only. Battery Voltage for KR3542-0650P20C/ KRP3542-0650P20C/KR5542-1050P20C/ KRP5542-1050P20C.
	24V	Read-only. Battery Voltage for KR3522-1250P20C/ KRP3522-1250P20C.
LBACC (Local Battery Available Charging Current)	60.0 A	User define: 5.0A to 60.0A for KR3542-0650P20C/ KRP3542-0650P20C, step size: 0.1A. Namely, the maximum allowable charge current on battery side.
	100.0A	User define: 5.0A to 100.0A for KR5542-1050P20C/ KRP5542-1050P20C, step size: 0.1A. Namely, the maximum allowable charge current on battery side.
	120.0A	User define: 5.0A to 120.0A for KR3522-1250P20C/ KRP3522-1250P20C, step size: 0.1A. Namely, the maximum allowable charge current on battery side.

Parameter	Default	User define
LBADC (Local Battery Available Discharging Current)	175.0 A	User define: 10.0A to 175.0A for KR3542-0650P20C /KRP3542-0650P20C, step size: 0.1A Namely, the maximum allowable discharge current on battery side.
	250.0A	User define: 10.0A to 250.0A for KR5542-1050P20C/ KRP5542-1050P20C, step size: 0.1A Namely, the maximum allowable discharge current on battery side.
	380.0A	User define: 10.0A to 380.0A for KR3522-1250P20C/ KRP3522-1250P20C, step size: 0.1A Namely, the maximum allowable discharge current on battery side.
BECT (Battery Equalize Charging Time)	120 m	User define: 10minutes to 180 minutes, step size: 1 minute
BECD (Battery Equalize Charging Date)	28 D	User define: 1–28, step size: 1
BBCT (Battery Boost Charging Time)	120 m	User define: 10minutes to 180 minutes, step size: 1 minute
BTCC (Battery Temperature Compensation Coefficient)	3 mV/℃/2V	User define: 0–9, step size: 1 Note: This option is reserved, which is invalid currently.
5.2 Advanced Battery Properties		
Li PROT (Lithium Battery Protection)	Disable	User define: Disable, Enable Set this value as "Enable," the charge/discharge low temperature limit function is effective.
LTSChrg (Low Temperature Stop Charging Temperature)	0 ℃	User define: -20℃ to 0℃, step size: 0.1℃ When the environment or the battery temperature is lower than this value,the inverter/charger will stop charging the battery.
LTSDischrg (Low Temperature Stop Discharging Temperature)	0 ℃	User define: -20℃ to 0℃, step size: 0.1℃ When the environment or the battery temperature is lower than this value, the inverter/charger will stop discharging.
BATT OTP (Battery Over Temperature Protection)	50.0 ℃	User define: (Battery Over Temperature Protection Recovery plus 5℃) to 60℃, step size: 0.1 ℃

Parameter	Default	User define
BATT OTPR (Battery Over Temperature Protection Recovery)	45.0 ℃	User define: 30.0 ℃ to (Battery Over Temperature Protection minus 5℃), step size: 0.1℃
Chrg (Charging)	Enable	Read-only
Dischrg (Discharging)	Enable	Read-only
PCUP (Phase Current Unbalance Protection)	Disable	User define: Disable, Enable Note: The parameter will only take effect when used in three phase. Note: After the setting value was changed, the factory reset cannot be restored to the default value, it must be set by manually.
INVPSet (Inverter Phase Setting)	S	User define: S (Single), A (Phase A), B (Phase B), C (Phase C) Note: After the "INVPSet" is changed, must turn off the inverter/charger for 10 seconds before restarting. Enter into the "System > Advanced Battery Properties" screen again to check if the change has taken effect. Note: After the setting value was changed, the factory reset cannot be restored to the default value, it must be set by manually.
UCD (Unbalanced Current Difference)	5 A	User define: 0A to 6000A, step size 1A Note: The parameter will only take effect when used in three phase. When “PCUP (Phase Current Unbalance Protection)” is enabled, if current unbalance value between any two phases is higher than set value, the load output will be turned off automatically. Note: After the setting value was changed, the factory reset cannot be restored to the default value, it must be set by manually.

Parameter	Default	User define
PWRSave (Power Saving)	Disable	User define: Disable, Enable When set to "Enable," the inverter/charger will enter the power saving mode if the AC output power continuously remains below 50W during the "PWRSDT (Power Saving Detection Time)." Power saving mode wake-up method: After the inverter/charger enters the power saving mode, it first shuts down for 5 minutes, then restarts automatically. And then, it monitors whether the AC output power is higher than 50W during the "PWRSDT." If the AC output power is higher than 50W, the inverter/charger wakes up and switches to normal operation mode; otherwise, it continues to maintain the power saving mode.
PWRSDT (Power Saving Detection Time)	10 m	User define: 1minute to 10 minutes, step size: 1 minute
5.3 Charge and Discharge Management		
BACC (Battery Available Charging Current) When the BMS is enabled and the communication between the inverter/charger and the lithium battery's BMS is normal, the "BACC" value is read from the BMS. Otherwise, the "BACC" value equals the setting value of "LBACC" after each power-on. If "LBACC" is changed without a subsequent restart, the "BACC" value remains the previous value of "LBACC".	60.0 A	Read-only, the maximum allowable charge current on battery side for KR3542-0650P20C/ KRP3542-0650P20C.
	100.0A	Read-only, the maximum allowable charge current on battery side for KR5542-1050P20C/ KRP5542-1050P20C.
	120.0A	Read-only, the maximum allowable charge current on battery side for KR3522-1250P20C/ KRP3522-1250P20C.

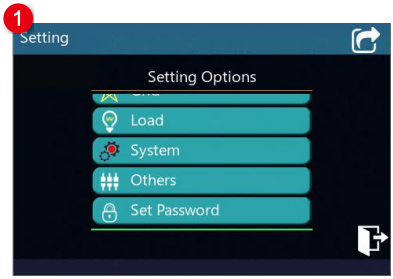
Parameter	Default	User define
BADC (Battery Available Discharging Current) When the BMS is enabled and the communication between the inverter/charger and the lithium battery's BMS is normal, the "BADC" value is read from the BMS. Otherwise, the "BADC" value equals the setting value of "LBADC" after each power-on. If "LBADC" is changed without a subsequent restart, the "BADC" value remains the previous value of "LBADC".	175.0 A	Read-only, the maximum allowable discharge current on battery side for KR3542-0650P20C/ KRP3542-0650P20C.
	250.0A	Read-only, the maximum allowable discharge current on battery side for KR5542-1050P20C/ KRP5542-1050P20C.
	380.0A	Read-only, the maximum allowable discharge current on battery side for KR3522-1250P20C/ KRP3522-1250P20C.
UACC (Utility Available Charging Current)	60.0 A	User define: 5.0A to 60.0A for KR3542-0650P20C/ KRP3542-0650P20C, step size: 0.1A Namely, the maximum current at the battery end when the utility charges the battery.
	100.0A	User define: 5.0A to 100.0A for KR5542-1050P20C/ KRP5542-1050P20C, step size: 0.1A Namely, the maximum current at the battery end when the utility charges the battery.
	110.0A	User define: 5.0A to 110.0A for KR3522-1250P20C/ KRP3522-1250P20C, step size: 0.1A Namely, the maximum current at the battery end when the utility charges the battery.
CMode (Charging Mode)	Solar+Grid	User define: Solar (Solar only), Solar > Grid (Solar priority), Solar+Grid, Grid > Solar (Grid priority). Note: For detailed working modes, refer to chapter 4
DMode (Discharge Mode)	PV>BT>BP	User define: PV>BP>BT (namely, PV>Bypass> Battery), PV>BT>BP (namely, PV>Battery> Bypass), BP>PV>BT (namely, Bypass>PV> Battery) Note: For detailed working modes, refer to chapter 4

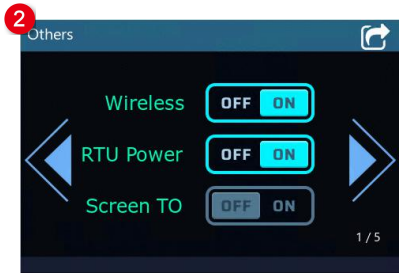
Parameter	Default	User define
ACmode (AC Input Mode)	Grid	User define: Grid, Oil When the AC input is an oil generator, this parameter needs to be set to "Oil" to improve the charging capability. Note: If the AC input mode does not match the AC source of the actual input, the normal operation of the inverter/charger will be affected. After setting, restart the inverter/charger for the setting to take effect.
PVMode (PV Mode)	Single	User define: Single, Parallel. When two or more PV arrays are independently input, the value shall be set to "Single." When two or more PV arrays are connected in parallel as a single input to the inverter/charger (the PV terminals need to be paralleled externally), the value needs to be set to "Parallel." Product with one PV input is “Single” by default (other PV modes are invalid).
BCCMode (Battery Charging Control Mode)	VOL	User define: VOL (Voltage), SOC VOL: The battery voltage control parameters take effect after setting this value as “VOL.” SOC: The SOC parameters take effect after setting this value as “SOC.” Note: If "SOC" is selected, the battery needs to go through several full charge and discharge cycles, and the battery capacity must be set correctly.
BMSProt (BMS Protocol)	10	User define: 1–29, step size: 1 Note: Refer to the Lithium battery protocol file.
BMS (BMS Enable)	Disable	User define: Disable, Enable Set this value as "Enable," the inverter/charger will communicate with the battery normally.
BMSVolt (BMS Voltage Control)	Enable	User define: Disable, Enable Set this value as "Enable," the BMS internal voltage control parameters will be automatically synchronized to the inverter/charger, and the inverter/charger will control the battery charging/discharging based on these parameters.

Parameter	Default	User define
BMSCurr (BMS Current Control)	Invalid	User define: Invalid, BMS Set this value as "Invalid," the inverter/charger controls the charge and discharge according to the value set on the LCD. Set this value as "BMS," the inverter/charger controls the charge and discharge according to the read BMS value.
BMSFail (BMS Fail Action)	DSP	User define: DSP, Disable DSP: The inverter/charger works according to the default mode and parameters. Disable: No charging and discharging, equivalent to standby mode.
BCM (Battery Connection Method)	Share	User define: Only, Share This parameter takes effect when the inverter/chargers are connected in parallel. If each inverter/charger is connected to the same battery pack, this value needs to be set to "Share." If each inverter/charger is connected to a separate battery pack, this value needs to be set to "Only."
5.4 System Time Setting		
5.5 Local Parameters		
LCD BRT (LCD Brightness)	100%	User define: 50% to 100% It indicates the LCD brightness when operating the LCD.
TODelay (Idle Timeout Delay)	15 S	User define: 6S to 60S, step size: 1S After not operating the LCD, when the set "TODelay" time arrives, the LCD brightness decreases to the set "LCDSBRT" brightness.
LCDSBRT (Standby LCD Brightness)	50%	User define: 35% to 100% It indicates the LCD brightness after no operation for more than "TODelay" time.
SOT (Screen OFF Time)	30 S	User define: 15S to 120S, step size: 1S If the "Screen TO" is set to "ON", the LCD will turn off if time of no operation exceeds the "TODelay" time, and then exceeds the "SOT" time.
Com ID (Communication ID)	1	User define: 1–240, step size: 1

Parameter	Default	User define
Com BPS (Communication Baud Rate)	115200bps	User define: 9600, 19200, 38400, 57600, 115200, 256000
DCT ON (Dry Contract ON Voltage)	44.0V (48V system) 22.0V (24V system)	User define: 9*N to (Dry Contract OFF Voltage minus 0.2*N), step size: 0.1V. Note: N=Rated battery voltage/12. When the battery voltage is lower than this value, the dry contact is connected.
DCT OFF (Dry Contract OFF Voltage)	50.0V (48V system) 25.0V (24V system)	User define: (Dry Contract ON Voltage plus 0.2*N) to 17*N, step size: 0.1V. Note: N=Rated battery voltage/12. When the battery voltage is higher than this value, the dry contact is disconnected.
Switch BMS	Enable	User define: Enable, Disable Under normal BMS communication, setting it to "Enable" allows charging, while setting it to "Disable" disallows charging. This parameter is invalid when BMS communication is abnormal.
Buzz	ON	User define: ON, OFF When set to "OFF," it will no buzzer even if faulty.
LED	ON	User define: ON, OFF When set to "OFF," the LED indicator is off
HRI (History Record Interval)	60S	User define: 1 second to 3600 seconds, step size: 1 second Set the time interval for recording the historical data (only refers to the voltage, current and other data stored regularly, excluding the historical faults. These historical data can be exported by the Solar Guardian PC software or Website.)

6. Others (Other parameters setting)





On the parameter setting screen, click ***Others*** to enter other parameters setting screen. The following information is displayed:

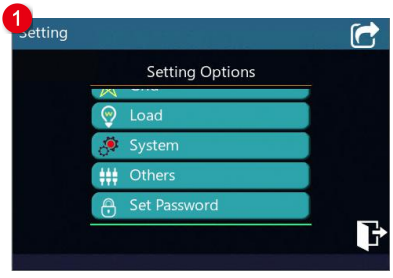
Click / to switch the page and set the relevant parameters directly via the touch screen operation.

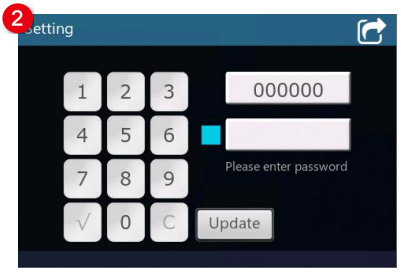
- **Default value and setting range for other parameters as shown in the below:**

Parameter	Default	User define
6. Others		
Wireless	OFF	It cannot be modified.
RTU Power (5V power supply for COM port)	ON	User define: OFF, ON Turn on or off the 5V power supply of the inverter/charger COM port. The external Bluetooth or WIFI module can only work after it is set to "ON."
Screen TO (Screen Timeout)	ON	User define: ON, OFF LCD backlight switch. Set to "ON," the LCD backlight will turn off after the "TODelay" time plus the "SOT" time has elapsed. Set to "OFF," the LCD backlight will remain on.
Parameter Rest	Normal Mode	User define: Normal Mode, Standby Mode To reset the settings parameters: select "Standby Mode," and then click the "Factory Reset" button to restore parts of setting parameters to the default values (including password settings).

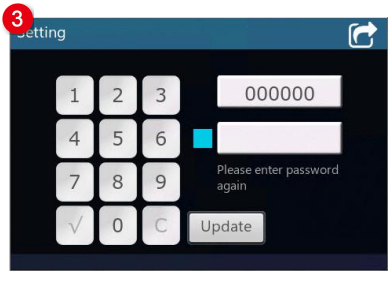
Parameter	Default	User define
Low Power Mode	ECO Mode	User define: ECO Mode, Normal Mode When set as "ECO Mode," the inverter/charger will enter the low power mode when certain conditions are met, such as no PV and utility, and the battery voltage drops to the low voltage disconnect voltage. When set as "Normal Mode," the inverter/charger will not enter the low power mode. If set to "Normal Mode," it will automatically return o "ECO Mode" after restarting.
Manual Equalizer	--	On the "Low Power Mode" screen, press the "Manual Equalizer" button to enter the manual equalization charging stage. If the inverter/charger is restarted at this time, it will automatically exit the manual equalization charging state. Note: This function has nothing to do with the selection of "Low Power Mode."
DC Source Characteristic	PV Source	User define: PV Source, DC Source When using a DC power supply instead of a PV array for power supply testing, set this parameter as "DC Source," otherwise the inverter/charger will not work properly. When set to "DC Source," the PV indicator will flash green; when set to "PV Source," the PV indicator will remain continuously green. If set to "DC Source," it will automatically return o "PV Source" after restarting.
Initializing Records	--	On the "DC Source Characteristic" screen, press the "Initializing Records" button to clear historical fault records after approximately 40 seconds. Note: This function has nothing to do with the selection of "DC Source Characteristic."
Clear Statistical Power	Day Month Year	User define: Day Month Year, Total Generation After selecting "Day Month Year" or "Total Generation", press the "Clear" button to clear the corresponding cumulative energy.

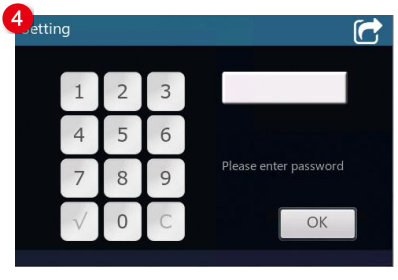
7. Set password





1. On the parameter setting page, click ***Set Password*** to enter the password modifying screen.	2. Enter the original password, the new password, and click Update to enter the screen of re-entering the password.



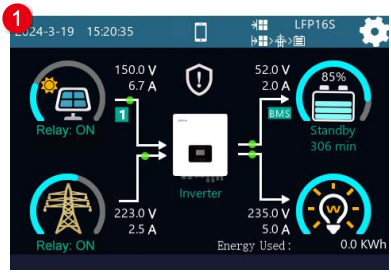


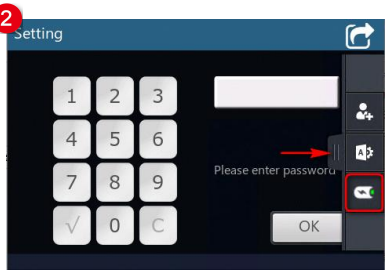
3. Enter the new password again and click Update.	4. Enter the new password and click OK to complete the password modifying and re-enter the parameter setting interface.

Note: The password can be changed to blank or any other digit no more than 6 digits. If the password is empty, no digits will be entered when changing the password.

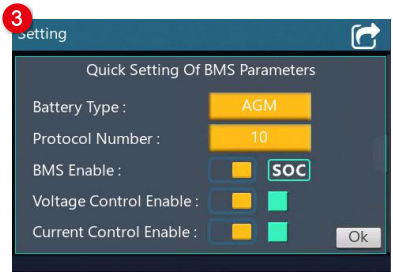
8. Quick Setting Of BMS Parameters

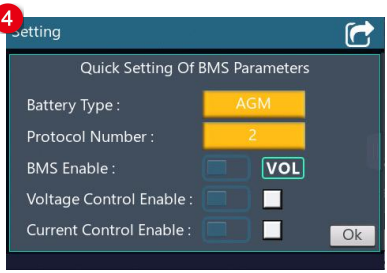
Note：Enter the “Quick Setting Of BMS Parameters” screen without an administrator password, allowing for rapid configuration of BMS related parameters.





1. On the home screen, click  in the upper-right corner.	2. Enter the password input screen, click  on the right screen, and then, click  to enter the “Quick Setting Of BMS Parameters” setting screen.





3. Select the “Battery Type” and “Protocol Number” according the actual situation, and click OK to back to the home screen.

- After select the “Protocol Number,” the default settings corresponding to the BMS protocol will be automatically loaded. The “BMS Enable” is in the “Enable” state by default and display  (in this state, the “BCCMode” is modified as “SOC”).
- When manual set the “BMS Enable” as “Disable,” icon  will be displayed (in this state, the “BCCMode” is modified as “VOL”). If you re-select the “Protocol Number” at this time, the “BMS Enable” will back to the “Enable” state.
- If the selected BMS protocol supports voltage and current control, the “Voltage Control Enable” and “Current Control Enable” will be in the “Enable” state and display green icon  .
- If the selected BMS protocol does not support the voltage and current control, the “Voltage Control Enable” and “Current Control Enable” will be in the “Disable” state and display gray icon  .

The above parameters can be modified separately on the administrator screen, please refer to 2.5.1 Parameter list for detailed settings.

- **Default value and setting range for BMS related parameters as shown in the below:**

Parameter	Default	User define
8. Quick Setting Of BMS Parameters		
Battery Type	AGM	**48V battery type:** AGM, OPZS, GEL, FLD, LFP15S, LFP16S, LNCM13S, LNCM14S **24V battery type:** AGM, OPZS, GEL, FLD, LFP8S, LNCM6S, LNCM7S
Protocol Number	10	User define: 1 – 29 Note: Refer to the Lithium battery protocol file.
BMS Enable	Enable	User define: Disable, Enable Set this value as "Enable," the inverter/charger will communicate with the battery normally.
BCCMode (Battery Charging Control Mode)	--	User define: VOL (Voltage), SOC When the “BMS Enable” is in the “Enable” state, the “BCCMode” is “SOC” by default; when the “BMS Enable” is in the “Disable” state, the “BCCMode” is “VOL.”
Voltage Control Enable	--	Read-only
Current Control Enable	--	Read-only

2.5.2 Battery work modes

The following table lists the recommended working mode and setting process for different application scenarios. According to your current battery status (such as whether it is a lithium-ion battery pack, whether it has BMS function, whether it has current control function at the end of charge and discharge, etc.), you can reasonably set the parameters to ensure that the battery works in the optimal performance, so as to ensure the safe operation of the system for a long time.

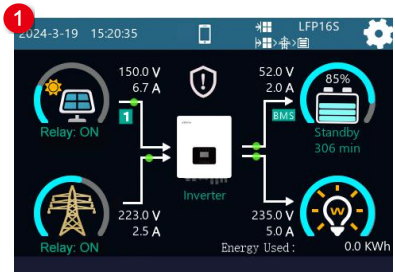
No.	Scenario	Recommended work Mode	Setting Process
1	Non-lithium battery pack	The inverter/charger controls charging and discharging based on the LCD settings.	See Figure 1 “Setting process for non-lithium battery pack ”
2	1. Lithium battery pack with BMS and current control function at the end of	The inverter/charger controls charging and discharging based on the read BMS	See Figure 2 “Setting process for lithium battery pack with BMS and current

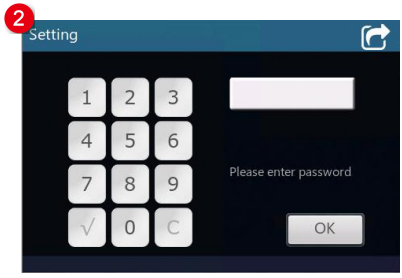
	charge and discharge 2. Normal communication	values.	control function”
3	1. Lithium battery pack with BMS, without current control function at the end of charge and discharge 2. Normal communication	The inverter/charger controls charging and discharging based on the LCD settings.	See Figure 3 “Setting process for lithium battery pack with BMS, without current control function”
4	1. Lithium battery pack with protective board only (no BMS) 2. No communication	The inverter/charger controls charging and discharging based on the LCD settings.	See Figure 4 “Setting process for lithium battery pack with protective board only”

- **Figure 1 “Setting process for non-lithium battery pack”**

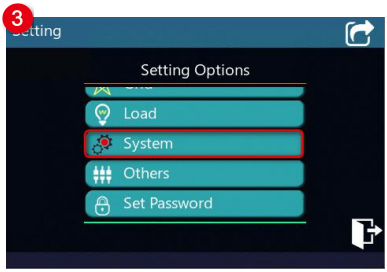
When the system adopts non-lithium battery packs (such as AGM, GEL, or FLD batteries), follow the flowchart below to set parameters correctly. The inverter/charger will control charging and discharging based on the LCD settings.

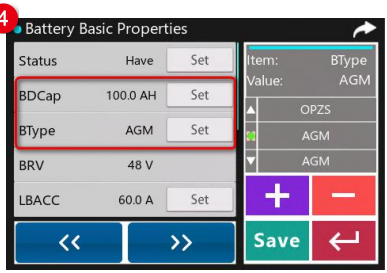
LCD	Parameter	Set value
Battery Basic Properties	BDCap (Battery Design Capacity)	Set it according to the battery you are actually using.
	BType (Battery Type)	
Charge and Discharge Management	BCCMode (Battery Charging Control Mode)	To set as “VOLT” or “SOC.” And then set the battery voltage control parameters or SOC control parameters..



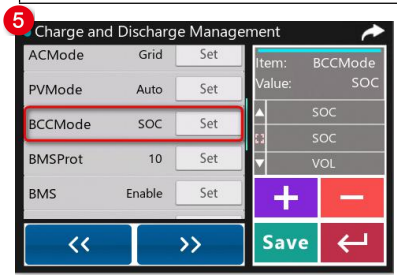


1. On the home screen, click  in the upper-right corner.	2. Enter the password input screen, enter the correct password (the initial password is 000000 by default), and click OK or √ to enter the parameter setting screen.





3. Slide up and down on the current screen, and click ***System*** to enter the system parameter setting screen.	4. Depending on the battery actually used, set "BDCap (Battery Design Capacity) and BType (Battery Type)". After the settings are complete, click Save to issue new parameter value.



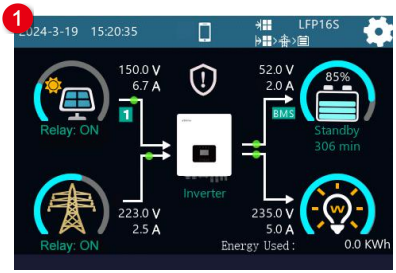
5. Click >> to switch to the "Charge and Discharge Management" screen, and set "BCCMode (Battery Charging Control Mode)" to "VOL" or "SOC." After the settings are complete, click Save to issue new parameter value.

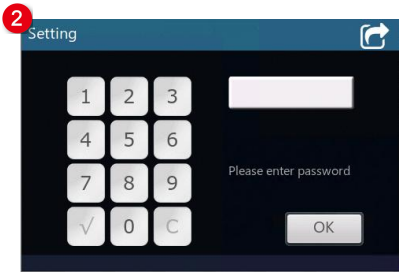
- **Figure 2 “Setting process for lithium battery pack with BMS and current control function”**

When the system adopts a lithium battery pack with BMS and current control function at the end of charge and discharge, and the lithium battery pack can communicate with the inverter/charger normally, follow the flowchart below to set parameters correctly. The inverter/charger controls charging and discharging based on the read BMS values.

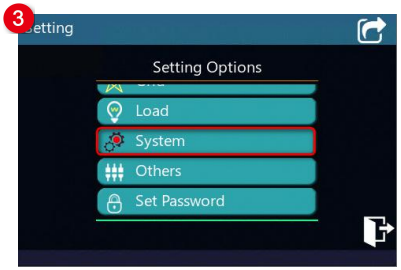
LCD	Parameter	Set value
Battery Basic Properties	BDCap (Battery Design Capacity)	Set it according to the battery you are actually using.
	BType (Battery Type)	Note: The battery type must be selected

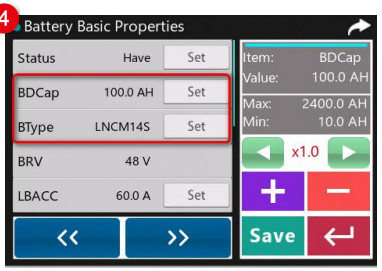
		as lithium battery, otherwise the lithium battery data cannot be read.
Charge and Discharge Management	BCCMode (Battery Charging Control Mode)	To set as “VOLT” or “SOC.” And then set the battery voltage control parameters or SOC control parameters..
	BMSProt (BMS Protocol)	Set the settings according to the actual battery protocol number used.
	BMS (BMS Enable)	Enable
	BMSVolt (BMS Voltage Control)	Enable
	BMSCurr (BMS Current Control)	BMS



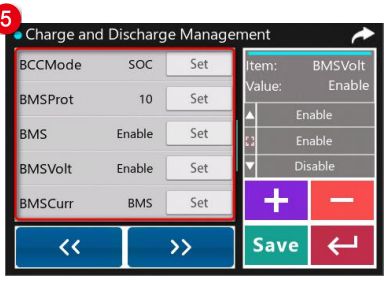


1. On the home screen, click  in the upper-right corner.	2. Enter the password input screen, enter the correct password (the initial password is 000000 by default), and click OK or √ to enter the parameter setting screen.





3. Slide up and down on the current screen, and click ***System*** to enter the system parameter setting screen.	4. Depending on the battery actually used, set "BDCap (Battery Design Capacity) and BType (Battery Type)". After the settings are complete, click Save to issue new parameter value.



5. Click >> to switch to the "Charge and Discharge Management" interface and set "BCCMode (Battery Charging Control Mode), BMSProt (BMS Protocol), BMS (BMS Enable), BMSVolt (BMS Voltage Control), BMSCurr (BMS Current Control)." After the settings are complete, click Save to issue new parameters.

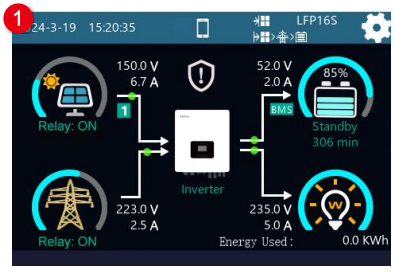
Tip	Please go to EPEVER official website to download the currently supported BMS manufacturers and the BMS parameters.
CAUTION	• The inverter/charger will control charging and discharging based on the LCD settings after setting the "BMSCurr (BMS Current Control)" as "Invalid," or the communication between battery and inverter/charger fails. • Due to the different charging and discharging characteristics and voltage consistency of lithium batteries from different manufacturers, it is necessary for professionals to guide the use of charging and discharging.

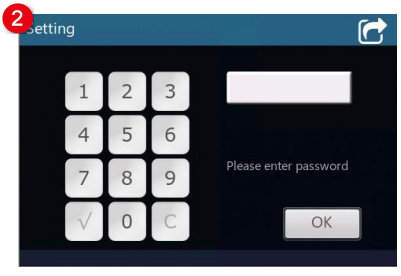
- **Figure 3 "Setting process for lithium battery pack with BMS, without current control function"**

When the system adopts a lithium battery pack with BMS, while without current control function at the end of charge and discharge, and the lithium battery pack can communicate with the inverter/charger normally, follow the flowchart below to set parameters correctly. The inverter/charger controls charging and discharging based on the LCD settings.

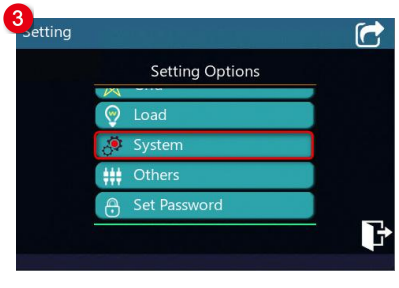
LCD	Parameter	Set value
Battery Basic Properties	BDCap (Battery Design Capacity)	Set it according to the battery you are actually using.
	BType (Battery Type)	

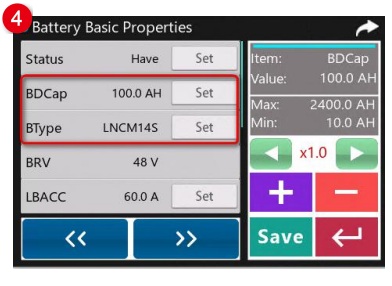
Charge and Discharge Management	BCCMode (Battery Charging Control Mode)	To set as “VOLT” or “SOC.” And then set the battery voltage control parameters or SOC control parameters.
	BMSProt (BMS Protocol)	Set the settings according to the actual battery protocol number used.
	BMS (BMS Enable)	Enable
	BMSVolt (BMS Voltage Control)	Enable



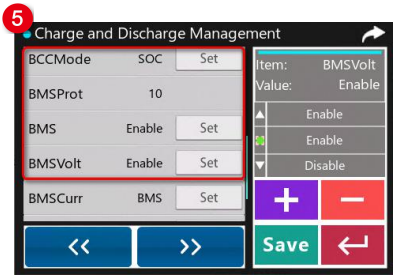


1. On the home screen, click  in the upper-right corner.	2. Enter the password input screen, enter the correct password (the initial password is 000000 by default), and click OK or √ to enter the parameter setting screen.





3. Slide up and down on the current screen, and click ***System*** to enter the system parameter setting screen.	4. Depending on the battery actually used, set "BDCap(Battery Design Capacity) and BType (Battery Type)." After the settings are complete, click Save to issue new parameter value.



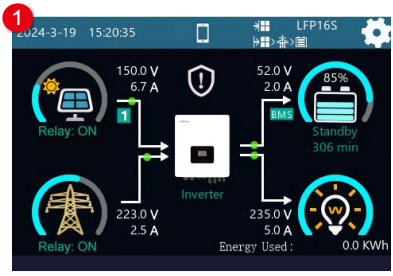
5. Click >> to switch to the "Charge and Discharge Management" interface and set "BCCMode (Battery Charging Control Mode), BMSProt (BMS Protocol), BMS (BMS Enable), and BMSVolt (BMS Voltage Control)." After the settings are complete, click Save to issue new parameter value.

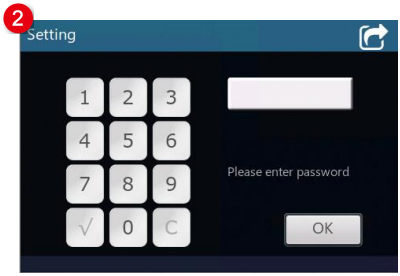
CAUTION	The inverter/charger will control charging and discharging based on the LCD settings after setting the "BMSCurr (BMS Current Control)" as "Invalid."

- **Figure 4 "Setting process for lithium battery pack with protective board only"**

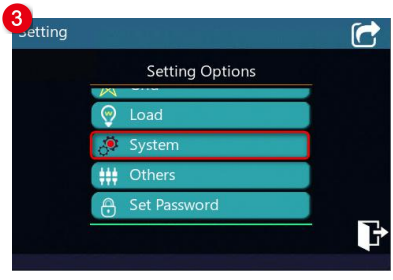
When the system adopts a lithium battery pack with protective board only, and the lithium battery pack cannot communicate with the inverter/charger normally (A smart remote temperature sensor is recommended in this scenario. Reserved function, this product is under development.), follow the flowchart below to set parameters correctly. The inverter/charger controls charging and discharging based on the LCD settings.

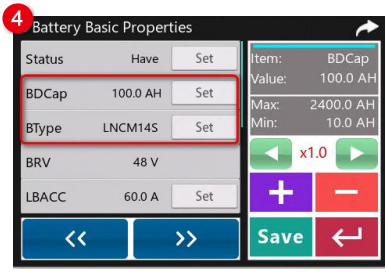
LCD	Parameter	Set value
Battery Basic Properties	BDCap (Battery Design Capacity)	Set it according to the battery you are actually using.
	BType (Battery Type)	
Charge and Discharge Management	BCCMode (Battery Charging Control Mode)	To set as "VOLT" or "SOC." And then set the battery voltage control parameters or SOC control parameters.



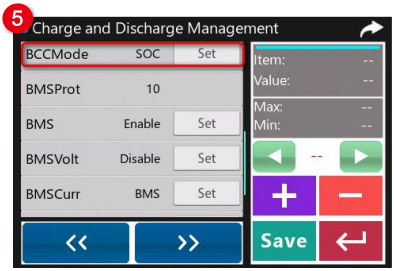


1. On the home screen, click  in the upper-right corner.	2. Enter the password input screen, enter the correct password (the initial password is 000000 by default), and click OK or √ to enter the parameter setting screen.





3. Slide up and down on the current screen, and click ***System*** to enter the system parameter setting screen.	4. Depending on the battery actually used, set "BDCap(Battery Design Capacity) and BType (Battery Type)." After the settings are complete, click Save to issue new parameter value.



5. Click >> to switch to the "Charge and Discharge Management" screen and set "BCCMode (Battery Charging Control Mode)." After the settings are complete, click Save to issue new parameters.

CAUTION	The inverter/charger will control charging and discharging based on the LCD settings after setting the “BMSCurent Select” as “INVALID.”

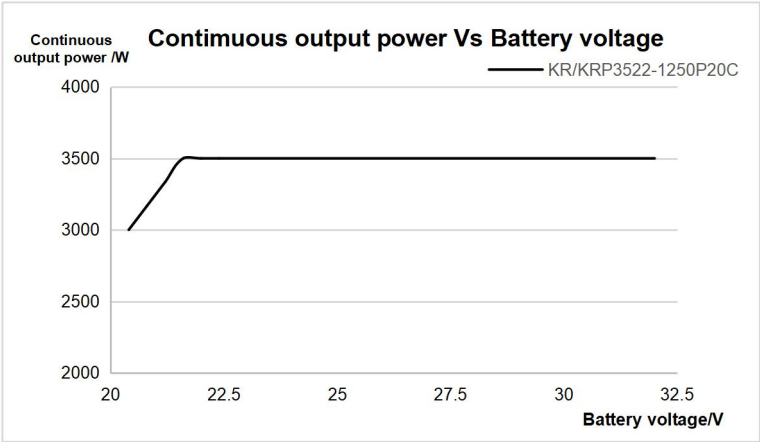
2.5.3 Battery voltage control parameters

1) Lead-acid battery voltage control parameters

The parameters are measured in the condition of 24V/25℃.

Battery Type / Voltage control parameters	AGM	OPZS	GEL	FLD	User define
Over Voltage Disconnect Voltage	32.0V	32.0V	32.0V	32.0V	21.5 - 32V
Charging limit voltage	30.0V	30.0V	30.0V	30.0V	21.5 - 32V
Over Voltage Reconnect Voltage	30.0V	30.0V	30.0V	30.0V	21.5 - 32V
Equalize Charging Voltage	29.2V	29.2V	--	29.6V	21.5 - 32V
Boost Charging Voltage	28.8V	28.8V	28.4V	29.2V	21.5 - 32V
Float Charging Voltage	27.6V	27.6V	27.6V	27.6V	21.5 - 32V
Boost Voltage Reconnect Voltage	26.4V	26.4V	26.4V	26.4V	21.5 - 32V
Low Voltage Reconnect Voltage	25.2V	25.2V	25.2V	25.2V	21.5 - 32V
Under Voltage Warning Recover Voltage	24.4V	24.4V	24.4V	24.4V	21.5 - 32V
Under Voltage Warning Voltage	24.0V	24.0V	24.0V	24.0V	21.5 - 32V
Low Voltage Disconnect Voltage	22.2V	22.2V	22.2V	22.2V	20.4 - 32V
Discharging Limit Voltage	20.3V	20.3V	20.3V	20.3V	Fix value

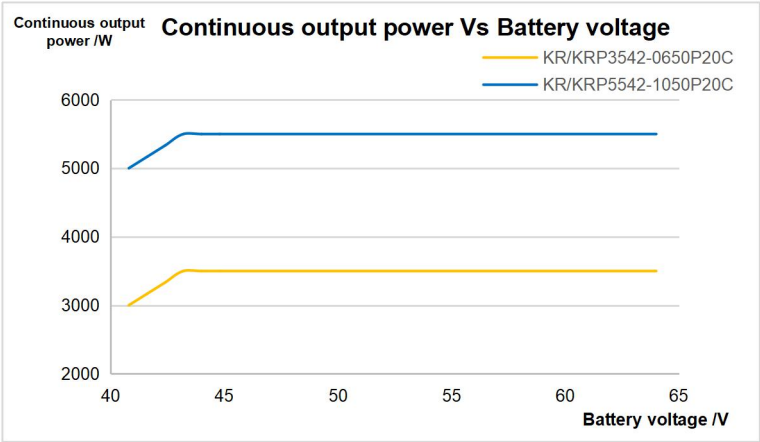
When the battery voltage is lower than 21.6V, the battery inverter output must be derated. Curve of Continuous output power Vs battery voltage for KR3522-1250P20C/KRP3522-1250P20C as below:



The parameters are measured in the condition of 48V/25 ºC.

Battery Type / Voltage control parameters	AGM	OPZS	GEL	FLD	User define
Over Voltage Disconnect Voltage	64.0V	64.0V	64.0V	64.0V	42.8 - 64V
Charging limit voltage	60.0V	60.0V	60.0V	60.0V	42.8 - 64V
Over Voltage Reconnect Voltage	60.0V	60.0V	60.0V	60.0V	42.8 - 64V
Equalize Charging Voltage	58.4V	58.4V	--	59.2V	42.8 - 64V
Boost Charging Voltage	57.6V	57.6V	56.8V	58.4V	42.8 - 64V
Float Charging Voltage	55.2V	55.2V	55.2V	55.2V	42.8 - 64V
Boost Voltage Reconnect Voltage	52.8V	52.8V	52.8V	52.8V	42.8 - 64V
Low Voltage Reconnect Voltage	50.4V	50.4V	50.4V	50.4V	42.8 - 64V
Under Voltage Warning Recover Voltage	48.8V	48.8V	48.8V	48.8V	42.8 - 64V
Under Voltage Warning Voltage	48.0V	48.0V	48.0V	48.0V	42.8 - 64V
Low Voltage Disconnect Voltage	44.4V	44.4V	44.4V	44.4V	40.8 - 64V
Discharging Limit Voltage	40.7V	40.7V	40.7V	40.7V	Fix value

When the battery voltage is lower than 43.2V, the battery inverter output must be derated. Curve of Continuous output power Vs battery voltage for KR5542-1050P20C/KRP5542-1050P20C, KR3542-0650P20C/KRP3542-0650P20C as below:



The following rules must be obeyed when setting the Lead-acid battery voltage control parameters.

A. Over Voltage Disconnect Voltage > Charging Limit Voltage ≥ Equalize Charging Voltage ≥ Boost Charging Voltage ≥ Float Charging Voltage > Boost Voltage Reconnect Voltage

B. Over Voltage Disconnect Voltage > Over Voltage Reconnect Voltage

C. Low Voltage Reconnect Voltage > Low Voltage Disconnect Voltage ≥ Discharging Limit Voltage

D. Under Voltage Warning Recover Voltage > Under Voltage Warning Voltage ≥ Discharging Limit Voltage

E. Boost Voltage Reconnect Voltage > Low Voltage Reconnect Voltage

2) Lithium battery voltage control

Battery Type / Voltage control parameters	LFP				
	24V system		48V system		
	LFP8S	User Define	LFP15S	LFP16S	User Define
Over Voltage Disconnect Voltage	29.6V	21.5 - 32V	55.5V	59.2V	42.8 - 64V
Charging Limit Voltage	29.2V	21.5 - 32V	54.7V	58.4V	42.8 - 64V
Over Voltage Reconnect Voltage	29.2V	21.5 - 32V	54.7V	58.4V	42.8 - 64V
Equalize Charging Voltage	28.5V	21.5 - 32V	53.5V	57.1V	42.8 - 64V
Boost Charging Voltage	28.5V	21.5 - 32V	53.5V	57.1V	42.8 - 64V
Float Charging Voltage	27.2V	21.5 - 32V	51.0V	54.4V	42.8 - 64V
Boost Voltage Reconnect Voltage	26.6V	21.5 - 32V	49.9V	53.2V	42.8 - 64V
Low Voltage Reconnect Voltage	26.0V	21.5 - 32V	48.7V	52.0V	42.8 - 64V

Under Voltage Warning Recover Voltage	25.6V	21.5 – 32V	48.0V	51.2V	42.8 – 64V
Under Voltage Warning Voltage	24.8V	21.5 – 32V	46.5V	49.6V	42.8 – 64V
Low Voltage Disconnect Voltage	23.2V	21.5 – 32V	43.5V	46.4V	42.8 – 64V
Discharging Limit Voltage	22.0V	Fix value	41.2V	44.0V	Fix value

Battery Type / Voltage control parameters	LFP					
	24V system			48V system		
	LNCM6S	LNCM7S	User Define	LNCM13S	LNCM14S	User Define
Over Voltage Disconnect Voltage	25.8V	30.1V	21.5 – 32V	55.9V	60.2V	42.8 – 64V
Charging Limit Voltage	25.5V	29.7V	21.5 – 32V	55.2V	59.5V	42.8 – 64V
Over Voltage Reconnect Voltage	25.5V	29.7V	21.5 – 32V	55.2V	59.5V	42.8 – 64V
Equalize Charging Voltage	24.8V	28.9V	21.5 – 32V	53.8V	57.9V	42.8 – 64V
Boost Charging Voltage	24.8V	28.9V	21.5 – 32V	53.8V	57.9V	42.8 – 64V
Float Charging Voltage	24.0V	28.0V	21.5 – 32V	52.0V	56.0V	42.8 – 64V
Boost Voltage Reconnect Voltage	23.5V	27.5V	21.5 – 32V	51.0V	55.0V	42.8 – 64V
Low Voltage Reconnect Voltage	22.2V	25.9V	21.5 – 32V	48.1V	51.8V	42.8 – 64V
Under Voltage Warning Recover Voltage	21.6V	25.2V	21.5 – 32V	46.8V	50.4V	42.8 – 64V
Under Voltage Warning Voltage	21.0V	24.5V	21.5 – 32V	45.5V	49.0V	42.8 – 64V
Low Voltage Disconnect Voltage	19.2V	22.4V	21.5 – 32V	41.6V	44.8V	42.8 – 64V
Discharging Limit Voltage	18.6V	21.7V	Fix value	40.3V	43.4V	Fix value

When setting the Lithium battery voltage control parameters, the following rules must be obeyed.

A. Over Voltage Disconnect Voltage < Over Charging Protection Voltage (BMS Circuit Protection Modules)-0.2V

B. Over Voltage Disconnect Voltage > Charging Limit Voltage ≥ Equalize Charging Voltage ≥ Boost Charging Voltage ≥ Float Charging Voltage > Boost Voltage Reconnect Voltage

C. Over Voltage Disconnect Voltage > Over Voltage Reconnect Voltage

D. Boost Voltage Reconnect Voltage > Low Voltage Reconnect Voltage > Low Voltage Disconnect Voltage ≥ Discharging Limit Voltage

E. Under Voltage Warning Recover Voltage > Under Voltage Warning Voltage ≥ Discharging Limit Voltage

F. Low Voltage Disconnect Voltage ≥ Over Discharging Protection Voltage (BMS Circuit Protection

Modules) plus 0.2V

 **CAUTION**	The BMS circuit protection module's voltage control accuracy must be at least ±0.2V. The [Over Voltage Disconnect Voltage] shall be lower than the protection voltage of the BMS circuit protection module. In contrast, the [Low Voltage Disconnect Voltage] shall be higher. The increased voltage of the [Over Voltage Disconnect Voltage] and the [Low Voltage Disconnect Voltage] is determined by the control accuracy of the BMS circuit protection module.

3 Single Installation

3.1 Attention

- Please read the manual carefully to familiarize yourself with the installation steps.
- Be very careful when installing the batteries, especially flooded lead-acid batteries. Please wear eye protection, and have fresh water available to rinse if contact with battery acid.
- Keep the battery away from any metal objects, which may cause a short circuit of the battery.
- Combustible and harmful gases may come out from the battery during charging. Ensure the ventilation condition is good.
- This inverter/charger is wall-mounted. Consider whether the wall's bearing capacity can meet the requirements.
- Ventilation is highly recommended if mounted in an enclosure. Never install the inverter/charger in a sealed enclosure with flooded batteries! Battery fumes from vented batteries will corrode and destroy the inverter/charger circuits.
- The inverter/charger can work with lead-acid and lithium batteries within its control scope.
- Ensure all switches and breakers are disconnected before wiring. You operate the inverter/charger after checking that all wiring is correct.
- Loose connections and corroded wires may produce high heat that can melt wire insulation, burn surrounding materials, or even cause a fire. Ensure tight connections, use cable clamps to secure cables, and prevent them from swaying in motion.
- Select the system connection cables according to the current density no greater than 5A/mm^2.
- The inverter/charger is for indoor installation only. Do not install the inverter/charger in a harsh environment such as humid, salt spray, corrosion, greasy, flammable, explosive, or dust accumulative.
- After turning off the switch, high voltage still exists inside the inverter/charger. Do not open or touch the internal devices; wait ten minutes before conducting related operations.
- The input terminal of the battery on the inverter/charger has the function of anti-reverse connection protection, but it is only effective when it is not connected to PV or Utility. Please strictly follow the operation and avoid frequent operations in fault.
- The inverter/charger has anti-reverse protection circuit at the PV input terminal.

CAUTION	1. The short-circuit current of the PV array must comply with the "PV Maximum Short-circuit Current" in chapter 8 Specifications. The reverse connection time should

	not exceed 5 minutes, avoid frequent operations in fault. 2. The PV array must first be connected to a 500VDC or above circuit breaker with arc extinguishing function, and then connected to the inverter/charger. If the PV is reversed, disconnect the external circuit breaker first, and then disconnect the PV array terminal (such as the MC4 terminal) or the PV input terminal of the inverter/charger. Otherwise, an electric arc will be generated, causing damage to the PV array or the inverter/charger.

- Utility input and AC output are high voltage. Please do not touch the wiring connection.
- When the fan is working, please do not touch it to avoid injury.

3.2 Wire and breaker size

The wiring and installation methods must conform to all national and local electrical code requirements.

➢ **Recommended PV wire and breaker size**

Since the PV output current varies with the PV module's size, connection method, or sunlight angle, the minimum wire size can be calculated by the PV Isc (Max. short circuit current). Please refer to the Isc value in the PV module's specifications. When the PV modules are connected in series, the total Isc equals any PV module's Isc. When the PV modules are connected in parallel, the total Isc equals the sum of the PV module's Isc. The PV array's Isc must not exceed the maximum PV input current. For max. PV input current and max. PV wire size, please refer to the table below:

Model	PV wire size	Circuit breaker
KR3522-1250P20C KR3542-0650P20C	4mm^2/11AWG	2P—20A (with arc extinguishing function)
KRP3522-1250P20C KRP3542-0650P20C	6mm^2/10AWG	2P—25A (with arc extinguishing function)

When two PV arrays are connected independently, the wire and circuit breaker size of each PV array are as follows:

Model	PV wire size	Circuit breaker
KR5542-1050P20C	4mm^2/11AWG	2P—20A (with arc extinguishing function)
KRP5542-1050P20C	6mm^2/10AWG	2P—25A (with arc extinguishing function)

When two PV arrays are connected in parallel, the wire and circuit breaker size are as follows:

Model	PV wire size	Circuit breaker
KR5542-1050P20C	10mm^2/7AWG	2P—50A (with arc extinguishing function)
KRP5542-1050P20C	13mm^2/6AWG	2P—50A (with arc extinguishing function)

CAUTION	When the PV modules are connected in series, the total voltage must not exceed the max. PV open circuit voltage 500V (At minimum operating environment temperature), or 440V (At 25℃).

➢ **Recommended Utility wire size**

Model	Utility wire size	Circuit breaker
KR3522-1250P20C KR3542-0650P20C KRP3522-1250P20C KRP3542-0650P20C	6mm^2/10AWG	2P—32A
KR5542-1050P20C KRP5542-1050P20C	10mm^2/7AWG	2P—50A

CAUTION	The utility input has the circuit breaker already; no need to add any more.

➢ **Recommended battery wire and breaker size**

Model	Battery wire size	Circuit breaker
KR3522-1250P20C KR5542-1050P20C KRP3522-1250P20C KRP5542-1050P20C	35 mm^2/2AWG	2P—200A
KR3542-0650P20C KRP3542-0650P20C	20mm^2/4AWG	2P—125A

CAUTION	The recommended battery breaker size is selected when the battery terminals are not connected to any additional inverter.

➢ **Recommended load wire size**

Model	Load wire size	Circuit breaker
KR3522-1250P20C KR3542-0650P20C KRP3522-1250P20C KRP3542-0650P20C	6mm^2/10AWG	2P—32A
KR5542-1050P20C KRP5542-1050P20C	10mm^2/7AWG	2P—50A

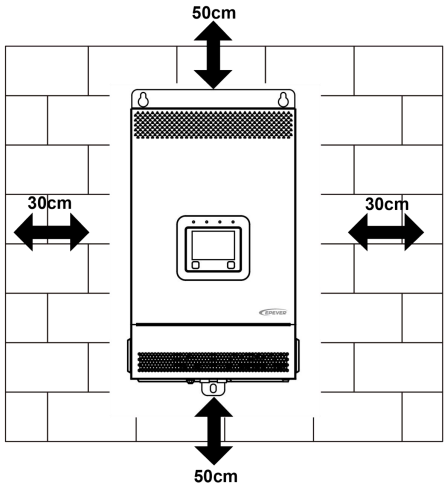
CAUTION	• The wire size is only for reference. Suppose a long distance exists between the PV array, the inverter/charger, and the battery. In that case, larger wires shall be used to reduce the voltage drop and improve the system's performance.

	• The above wire and circuit breaker sizes are for reference only; please choose a suitable wire and circuit breaker according to the actual situation.

3.3 Mounting the inverter/charger

WARNING	Risk of explosion! Never install the inverter/charger in a sealed enclosure with flooded batteries! Do not install the inverter/charger in a confined area where the battery gas can accumulate.
CAUTION	The inverter/charger can be fixed to the concrete and solid brick walls, while it cannot be fixed to the hollow brick wall. The inverter/charger requires at least 30cm of clearance right and left, and 50cm of clearance above and below.

Step1: Determine the installation location and heat-dissipation space. The inverter/charger requires at least 30cm of clearance right and left, and 50cm of clearance above and below.



Step2: According to the installation position marked with the mounting plate 1, drill two M10 holes with an electric drill.

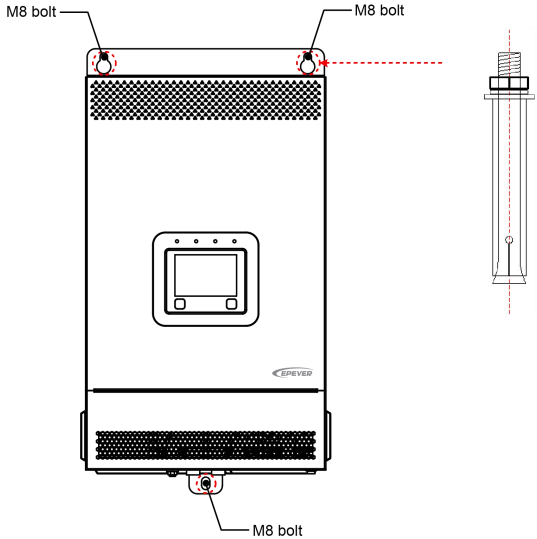
Step3: Insert the screws of the M8 bolts and the steel pipes into the two M10 holes.

Step4: Install the inverter/charger and determine the installation position of the M10 hole (located at the bottom of the inverter/charge).

Step5: Remove the inverter/charger and drill an M10 hole according to the position determined in **step4**.

Step6: Insert the screw of the M8 bolt and the steel pipe into the M10 hole.

Step7: Install the inverter/charger and secure the nuts with 3 sleeves.

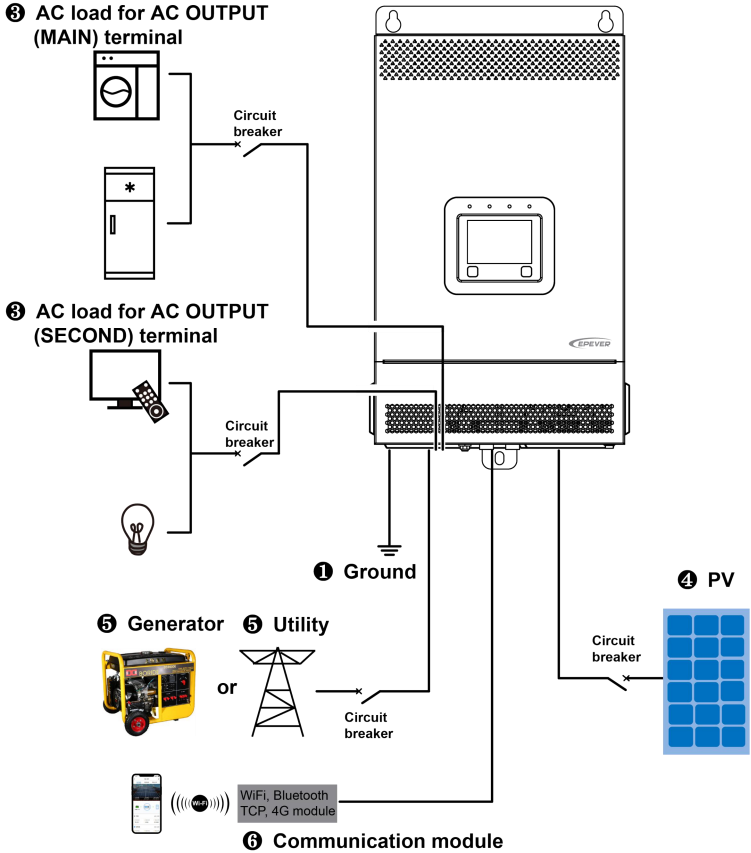


3.4 Wiring the inverter/charger

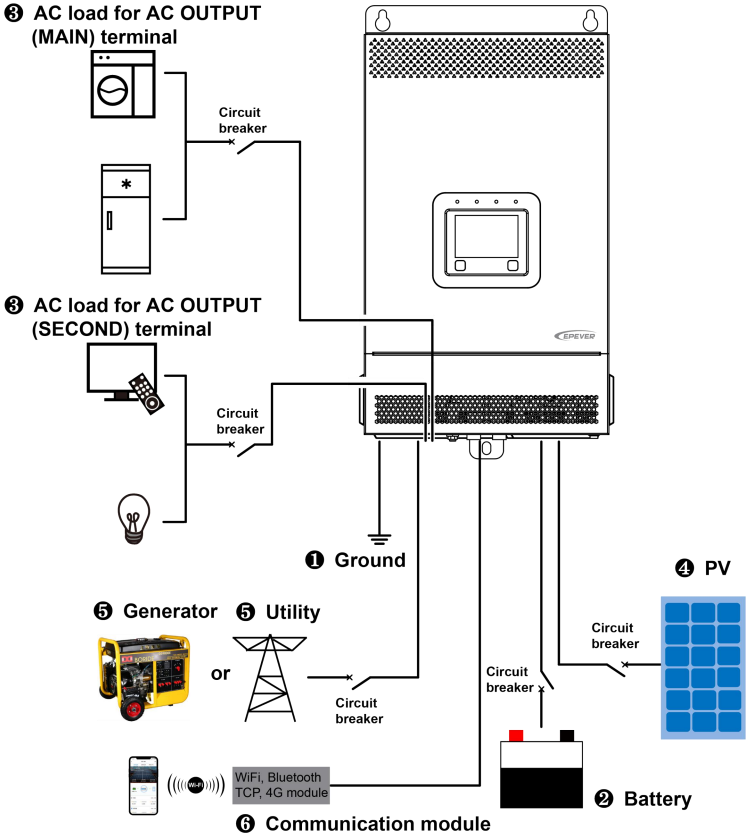
Connect the inverter/charger in the order of "❶Ground > ❷Battery > ❸Load > ❹PV > ❺Utility or Generator > ❻Optional accessories", and disconnect the inverter/charger in the reverse order. **The following wiring sequence is illustrated in the appearance of "KR3522-1250P20C/KRP3522-1250P20C/KR3542-0650P20C/KRP3542-0650P20C."**

For wiring positions of other models, please refer to the actual product appearance.

- **No battery mode**



- **Battery mode**

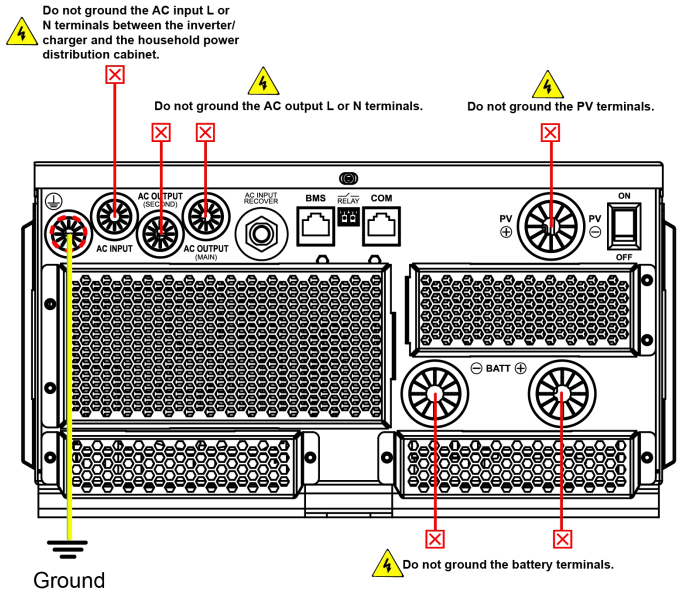


1. Grounding

The inverter/charger has a dedicated grounding terminal, which must be grounded reliably. The grounding wire size must be consistent with the recommended load wire size. The grounding connection point shall be as close as possible to the inverter/charger, and the total grounding wire shall be as short as possible.

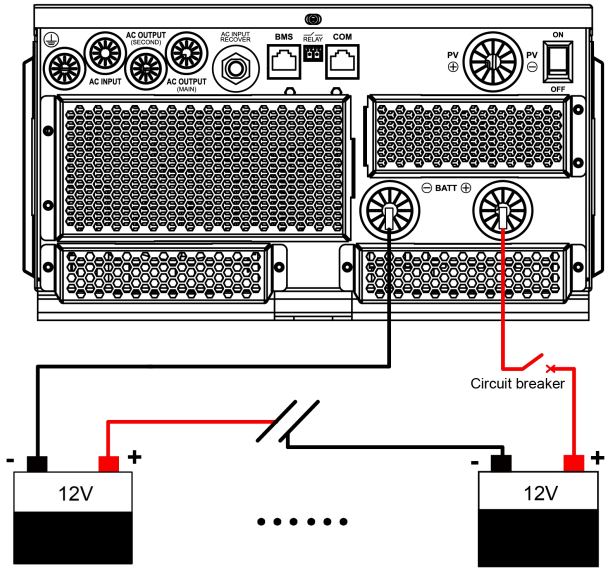
☒ **No grounding**	☒ Do not ground the battery terminals.
	☒ Do not ground the PV terminals.

	☒ Do not ground the AC input L or N terminals between the inverter/charger and the household power distribution cabinet.
	☒ Do not ground the AC output L or N terminals.
☑ **Grounding**	☑ The cabinet of the inverter/charger is connected to earth through the earth rail, along with the AC input and output's PE (Protective Earth) terminal.



2. Connect the battery

⚠ **CAUTION**	• Please disconnect the circuit breaker before wiring and ensure that the leads of the "+" and "-" poles are polarity correctly. • The "+" and "-" poles on the inverter/charger has no anti-reverse protection circuit at the DC input terminal, it is prohibited to reverse connect the battery. • A circuit breaker must be installed on the battery side. For selection, please refer to chapter 3.2 Wire and breaker size.



3. Connect the AC load

WARNING	• Risk of electric shock! When wiring the AC load, please disconnect the circuit breaker and ensure that the poles' leads are connected correctly. • The AC loads shall be determined by the continuous output power of the inverter/charger. The AC load's surge power must be lower than the instantaneous surge power of the inverter/charger, or the inverter/charger will be damaged. • If inductive loads such as motors, or a bidirectional transfer switch is connected to the AC output terminal, a separate overvoltage and overcurrent protector (VA-Protector) needs to be installed at the AC output terminal.

Note: The output power of the AC output main and second power-off interfaces is the same, but the battery voltage is different for the power off. The battery voltage is higher when the main AC output is disconnected. Please connect your load to the appropriate AC output interface according to the actual situation.

- **Control logic for main and second power off of AC output**

ⓘ When the battery voltage is lower than the UVW (Under Voltage Warning Voltage), the AC output

main power-off relay will be disconnected after a 5-second delay. Once the battery voltage rises above the LVR (Low Voltage Reconnect Voltage), the AC output main power-off relay will be reconnected after a 5-minute delay, restoring the output of the AC output main load interface.

② When the battery voltage is lower than the LVD (Low Voltage Disconnect Voltage), there is no output at the AC output second load interface. Once the battery voltage rises above the LVR (Low Voltage Reconnect Voltage), restoring the output of the AC output second load interface.

③ When the battery voltage is between UVW and LVR for the first power-up, the AC output main power-off relay will be connected, restoring the output of the AC output main load interface.

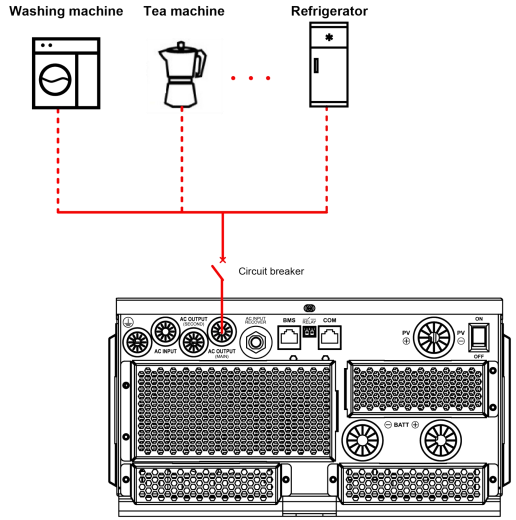
④ If the UVW is set higher than the LVR, the AC output main power-off relay will be forcibly disconnected after a 5-second delay. Once the UVW and LVR are correctly set, the AC output main power-off relay will be reconnected after a 5-minute delay, restoring the output of the AC output main load interface.

⑤ When the Utility is connected, the AC output main power-off relay remains connected (independent of battery voltage). Once the Utility is disconnected, the control logic of ① to ④ is restored.

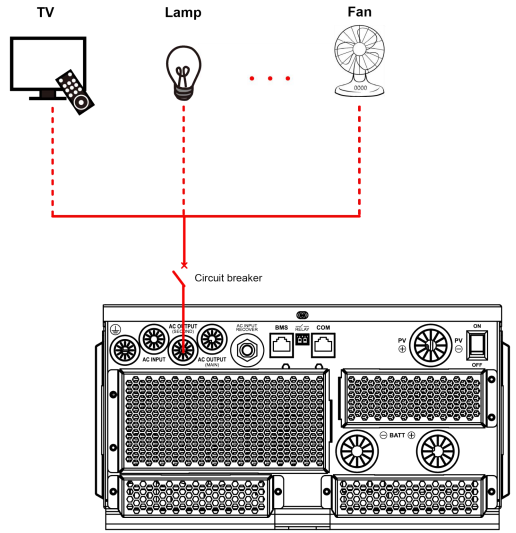
⑥ In the no battery mode, the AC output main power-off relay remains connected (independent of battery voltage), ensuring continuous output at the AC output main load interface.

CAUTION	If there is no output at the AC output main load interface, please follow the steps below to troubleshoot: 1. Check whether the battery voltage is lower than the "UVW " during no-load output. If the battery voltage is lower than the "LVR," please charge the battery. When the battery voltage is higher than the "LVR," restoring the output of the AC output main load interface. 2. If the battery voltage is higher than the "UVW" during no-load output, but there is no output or abnormal output after load is ON. Please reduce loads connected to the AC output main load interface, or increase the battery capacity, or increase the voltage difference between the "UVW" and the "LVR" appropriately, until the load output is normal.

- **AC OUTPUT (MAIN) connection**

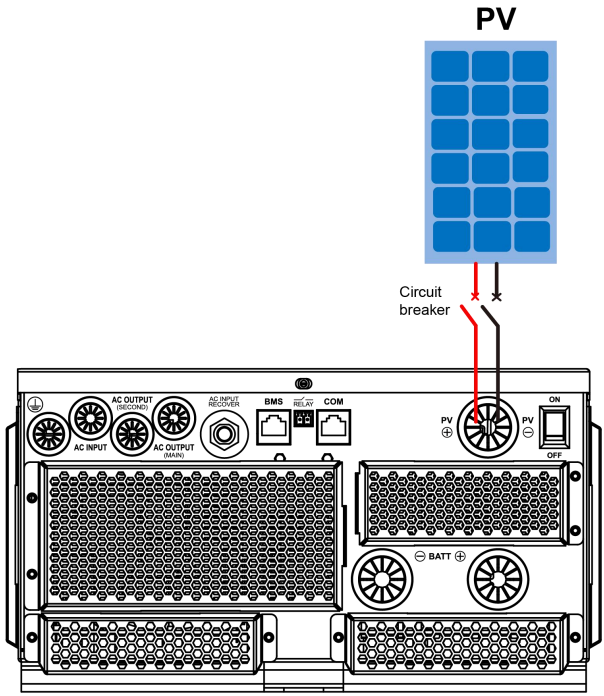


- **AC OUTPUT (SECOND) connection**



4. Connect the PV modules

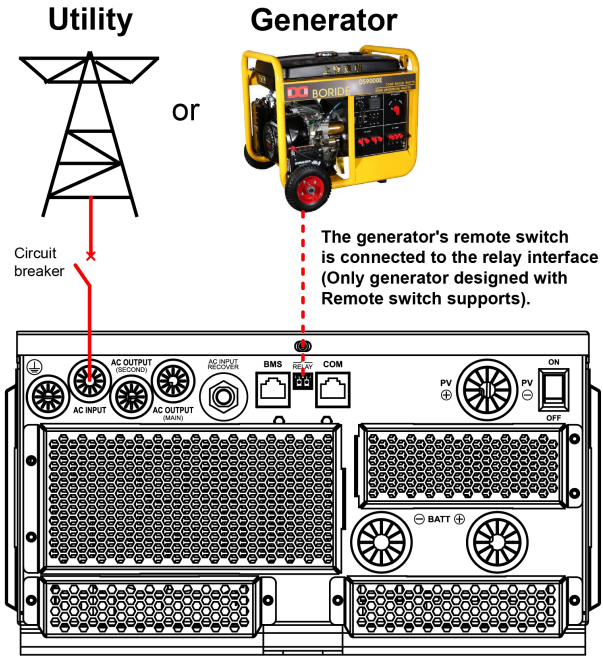
WARNING	• Risk of electric shock! The PV array can generate dangerous high-voltage! Disconnect the circuit breaker before wiring, and ensure that the leads of "+" and "-" poles are connected correctly. • It is forbidden to connect the positive and negative poles of the PV with the ground; otherwise, the inverter/charger will be damaged.
CAUTION	Suppose the inverter/charger is used in an area with frequent lightning strikes. In that case, install an external surge arrester at the PV input and utility input terminals is a must.



5. Connect the Utility or generator

WARNING	• Risk of electric shock! The Utility input can generate dangerous high-voltage! Disconnect the circuit breaker or fast-acting fuse before wiring, and ensure that the poles' leads are connected correctly.

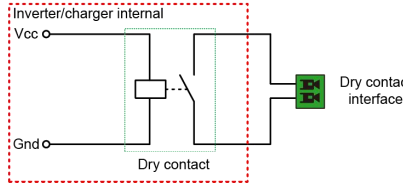
	• After the Utility is connected, the PV and battery cannot be grounded. In contrast, the inverter/charger cover must be grounded reliably (to shield the outside electromagnetic interference effectively and prevent the cover from causing electric shock to the human body).
CAUTION	There are various types of oil generators with complex output conditions. It is recommended to use the inverter oil generator. If non-inverter oil generators are used, they must be tested in practice before use.



Dry contact interface:

✧ **Function：**

The dry contact interface can turn on/off the generator and is connected parallel with the generator's switch.



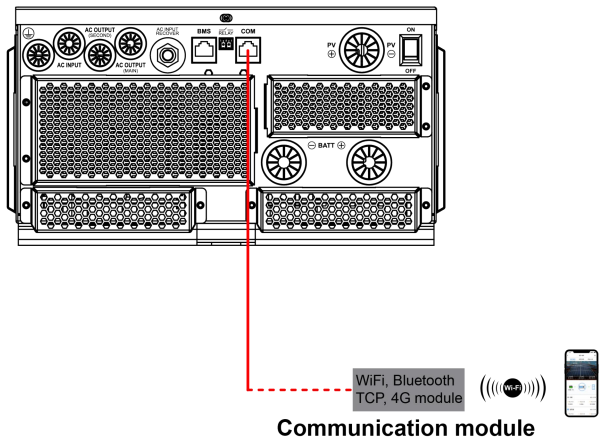
✧ **Working principle:**

When the battery voltage reaches the *DCT ON (Dry Contact ON Voltage)* the dry contact is connected. Its coil is energized. The dry contact can drive loads of no more than 125VAC /1A, 30VDC/1A. According to different battery types of the inverter charger, the default values of the *DCT ON (Dry Contact ON Voltage)* and *the DCT OFF (Dry Contact OFF Voltage)*are different. Please refer to the chapter 2.5.1 Parameters list for details.

6. Connect optional accessories

Connect the communication module

Connect the WiFi, Bluetooth, 4G, or TCP module to the RS485 com. port. End-users can remote monitor the inverter/charger or modify related parameters on the phone APP. Detailed setting methods, refer to user manual for the WiFi, Bluetooth, 4G, or TCP module.



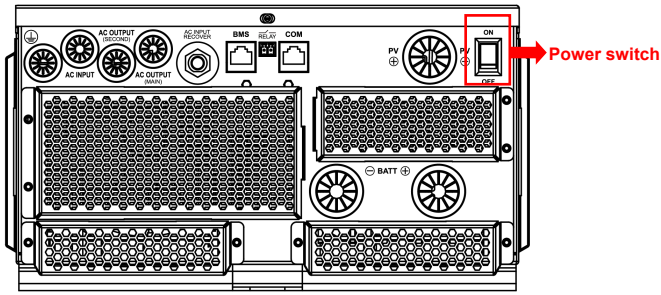
Note: For the specific communication modules supported, please refer to the accessories list file.

3.5 Operate the inverter/charger

Step 1: Double-check whether the wire connection is correct.

Step 2: Connect the battery circuit breaker.

Step 3: Turn on the power switch. The LCD will be lit, which means the system running is normal.



WARNING	• Connect the battery circuit breaker first. After the inverter/charger normally works, connect the PV array and plug the utility's socket. Otherwise, we won't assume any responsibility for not following the operation. • The AC output is ON by default after the inverter/charger is powered. Before turning on the power switch, ensure the AC output is connected to loads correctly, and no safety hazard exists.

Step 4: Set parameters by the buttons.

CAUTION	For detailed parameters setting, refer to chapter 2.5 Parameters setting.

Step 5： Use the inverter/charger.

Connect the load circuit breaker, the PV array circuit breaker, and plug the utility's socket in sequence. After the AC output is normal, turn on the AC loads one by one. Do not turn on all the loads simultaneously to avoid protection action due to a large transient impulse from the current. The inverter/charger will perform normal work according to the set working mode. See 2.4 Real-time data.

CAUTION	• When supplying power for different AC loads, turning on the load with a larger impulse current first is recommended. After the load output is stable, turn on the load with a smaller impulse current later. • If the inverter/charger cannot work properly or the LCD/indicator shows an abnormality, refer to 6 Troubleshooting or contact our after-sales personnel.

4 Working modes

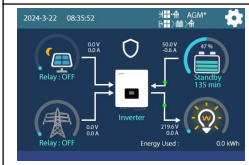
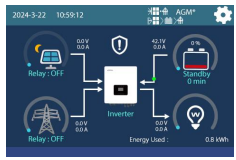
4.1 Abbreviation

Abbreviation	Instruction
P_{PV}	PV power
P_{LOAD}	Load power
V_{BAT}	Battery voltage
LVD	Low Voltage Disconnect Voltage
LVR	Low Voltage Reconnect Voltage
DP	Low Energy Disconnect SOC
DPR	Low Energy Disconnect Recover SOC
AUX OFF	Auxiliary module OFF voltage (namely, Utility charging OFF voltage)
AUX ON	Auxiliary module ON voltage (namely, Utility charging ON voltage)
UAC OFF	Utility Charging OFF SOC
UAC ON	Utility Charging ON SOC
LBACC	Local Battery Available Charging Current
SOC	The battery charging state, which indicates the ratio of the current storage capacity dividing the maximum storage capacity. This value is automatically read from the BMS and displayed on the "BAT DATA" screen.
PV>BP>BT	Discharging Mode: PV>Bypass>Battery
PV>BT>BP	Discharging Mode: PV>Battery>Bypass
BP>PV>BT	Discharging Mode: Bypass>PV>Battery

4.2 Off-Grid working modes

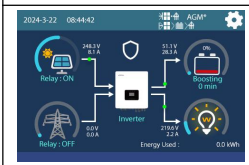
4.2.1 Battery mode

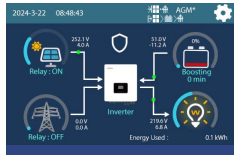
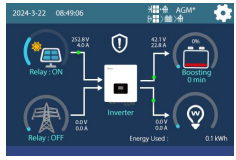
Scenario A: Both PV and Utility are not available.

（A） PV ☒ Utility ☒	**Regardless of the input and output sources, the working mode is as follows.**  VBAT ≥ LVR /SOC≥DPR ⇃ V_{BAT} ≤ LVD / SOC ≤ DP  ❶Any of the following is satisfied, the battery supplies the load. • The battery voltage is greater than or equal to the **LVR** value. • The battery SOC is greater than or equal to the **DPR** value. ❷Any of the following is satisfied, the battery stops supplying the load. • The battery voltage is lower than or equal to the **LVD** value. • The battery SOC is lower than or equal to the **DP** value.

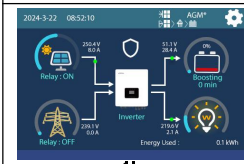
CAUTION	• Set the "BCCMode" as "VOL," the working mode is determined by the battery voltage value. • Set the "BCCMode" as "SOC," the working mode is determined by the battery SOC. Before using the SOC mode, set the "BCCMode" as "VOL" first. Because the battery SOC value will be more accurate after a full charge-discharge cycle in the "VOL" mode. • For setting the "BCCMode", refer to chapter 2.5.1 Parameters list.

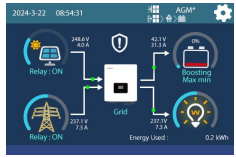
Scenario B: PV is available, but the Utility is not available.

（B） PV ☑ Utility ☒	**Regardless of the input and output sources, the working mode is as follows.**  P_{PV} > P_{LOAD} ⇃ P_{PV} ≤ P_{LOAD} ❶ When the PV power is greater than the load power, the PV charges the battery and supplies extra power to the load.

	 $V_{BAT} \geq LVR$ / $SOC \geq DPR$ ‖ $V_{BAT} \leq LVD$ / $SOC \leq DP$ 	❷ When the PV power is lower than or equal to the load power, the PV will not charge the battery, the battery will cut in to supply power to the load together with the PV. ❸Any of the following is satisfied, the PV and the battery stop supplying power to the load. The PV charges the battery only. • The battery voltage is lower than or equal to the **LVD** value. • The battery SOC is lower than or equal to the **DP** value.
	Note: When the battery voltage is greater than or equal to the LVR value, or the battery SOC is greater than or equal to the DPR value, the working mode returns to state ❷.	

Scenario C: Both PV and Utility are available.

	Charging Mode: "Solar"	**Discharging Mode: "PV>BP>BT" or "PV>BT>BP"**
（C-1） **PV** ☑ **Utility** ☑	 $P_{PV} > P_{LOAD}$ ‖ $P_{PV} \leq P_{LOAD}$  $V_{BAT} \geq LVR$ / $SOC \geq DPR$ ‖ $V_{BAT} \leq LVD$ / $SOC \leq DP$	❶ When the PV power is greater than load power, the PV charges the battery and supplies extra power to the load. ❷ When the PV power is lower than or equal to the load power, the PV will not charge the battery, the battery will cut in to supply power to the load together with the PV.



❸ Any of the following is satisfied, the Utility supplies power to the load, and the PV prioritizes charging the battery.

- The battery voltage is lower than or equal to the **LVD** value.
- The battery SOC is lower than or equal to the **DP** value.

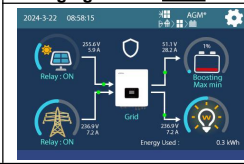
Note: When the battery voltage is greater than or equal to the LVR value, or the battery SOC is greater than or equal to the DPR value, the working mode returns to state❷.

（C-2）

PV ☑

Utility ☑

Charging Mode: "Solar"



Discharging Mode: "BP>PV>BT"

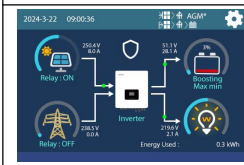
The Utility supplies power to the load, and the PV charges the battery only.

（C-3）

PV ☑

Utility ☑

Charging Mode: "Solar > Grid"



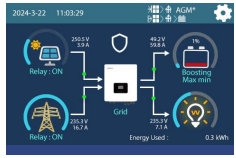
$P_{PV} > P_{LOAD}$ ⇅ $P_{PV} \leq P_{LOAD}$

$V_{BAT} \geq$ AUX OFF / SOC ≥ UAC OFF ⇅ $V_{BAT} \leq$ AUX ON / SOC ≤ UAC ON

Discharging Mode: "PV>BP>BT" or "PV>BT>BP"

❶ When the PV power is greater than the load power, the PV charges the battery and supplies extra power to the load.

❷ When the PV power is lower than or equal to the load power, the PV will not charge the battery, the battery will cut in to supply power to the load together with the PV.



❸ Any of the following is satisfied, the Utility supplies power to the load and charges the battery together with the PV.

- The battery voltage is lower than or equal to the **AUX ON** value.
- The battery SOC is lower than or equal to the **UAC ON** value.

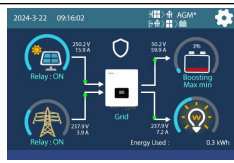
Note: When the battery voltage is greater than or equal to the **AUX OFF** value, or the battery SOC is greater than or equal to the **UAC OFF** value, the working mode returns to state❷.

（C-4）

PV ☑

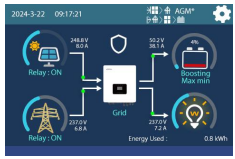
Utility ☑

Charging Mode: "Solar > Grid"



❶ When the PV power is greater than the (**LBACC***V_{BAT}), the Utility and PV supply power to the load, and the PV charges the battery at the same time.

P_{PV} > LBACC*V_{BAT} ⇅ P_{PV} ≤ LBACC*V_{BAT}



❷ When the PV power is lower than or equal to the (**LBACC***V_{BAT}), the Utility supplies power to the load and the PV charges the battery.

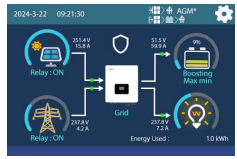
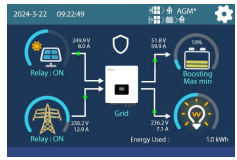
V_{BAT} ≥ AUX OFF / SOC ≥ UAC OFF ⇅ V_{BAT} ≤ AUX ON / SOC ≤ UAC ON

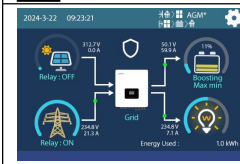
❸ Any of the following is satisfied, the Utility supplies power to the load and charges the battery together with the PV.

- The battery voltage is lower than or equal to the **AUX ON** value.
- The battery SOC is lower than or equal to the **UAC ON** value.

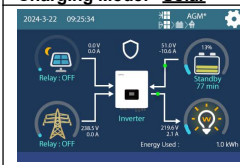
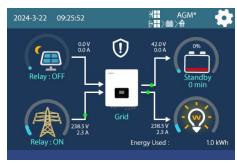
Note: When the battery voltage is greater than or equal to the **AUX OFF** value, or the battery SOC is greater than or equal to the **UAC OFF** value, the working mode returns to state❷.

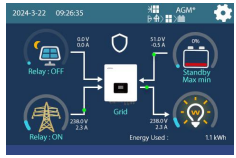
Discharging Mode: "BP>PV>BT"

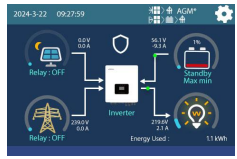
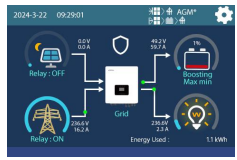
（C-5） PV ☑ Utility ☑	**Charging Mode: "Solar+Grid"**	**Discharging Mode: No impact under any mode**
	 $P_{PV} > LBACC*V_{BAT}$ ‖ $P_{PV} \le LBACC*V_{BAT}$ 	❶ When the PV power is greater than the (**LBACC***V_{BAT}), the Utility and PV supply power to the load, and the PV charges the battery simultaneously. ❷ When the PV power is lower than or equal to the (**LBACC***V_{BAT}), the Utility supplies power to the load first ,and charges the battery together with the PV.

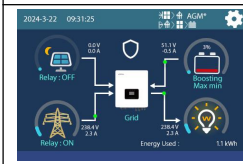
（C-6） PV ☑ Utility ☑	**Charging Mode: "Grid > Solar"**	**Discharging Mode: No impact under any mode**
		The Utility supplies power to the load and charges the battery simultaneously.

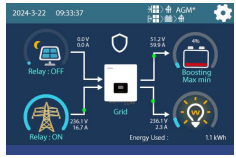
Scenario D: The PV is not available, but the Utility is available.

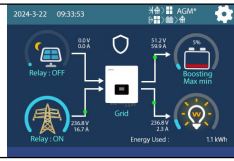
（D-1） PV ☒ Utility ☑	**Charging Mode: "Solar"**	**Discharging Mode: "PV>BT>BP"**
	 $V_{BAT} \ge LVR$ / $SOC \ge DPR$ ‖ $V_{BAT} \le LVD$ / $SOC \le DP$ 	❶Any of the following is satisfied, the battery supplies the load. • The battery voltage is greater than or equal to the **LVR** value. • The battery SOC is greater than or equal to the **DPR** value. ❷ Any of the following is satisfied, the Utility supplies power to the load. • The battery voltage is lower than or equal to the **LVD** value. • The battery SOC is lower than or equal to the **DP** value.

（D-2） PV ☒ Utility ☑	**Charging Mode: "Solar"**	**Discharging Mode: "PV>BP>BT" or "BP>PV>BT"**
		The Utility supplies power to the load.

（D-3） PV ☒ Utility ☑	**Charging Mode: "Solar > Grid"**	**Discharging Mode: "PV>BT>BP"**
	 V_{BAT} ≥ AUX OFF / SOC ≥ UAC OFF V_{BAT} ≤ AUX ON / SOC ≤ UAC ON 	❶Any of the following is satisfied, the battery supplies the load. • The battery voltage is higher than or equal to the **AUX OFF** value. • The battery SOC is greater than or equal to the **UAC OFF** value. ❷Any of the following is satisfied, the Utility supplies power to the load and charges the battery simultaneously. • The battery voltage is lower than or equal to the **AUX ON** value. • The battery SOC is lower than or equal to the **UAC ON** value.

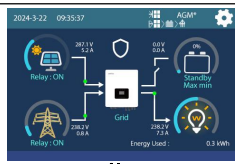
（D-4） PV ☒ Utility ☑	**Charging Mode: "Solar > Grid"**	**Discharging Mode: "PV>BP>BT" or "BP>PV>BT"**
	 V_{BAT} ≥ AUX OFF / SOC ≥ UAC OFF V_{BAT} ≤ AUX ON / SOC ≤ UAC ON	❶Any of the following is satisfied, the Utility supplies power to the load. • The battery voltage is greater than or equal to the **AUX OFF** value. • The battery SOC is greater than or equal to the **UAC OFF** value.

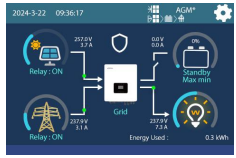
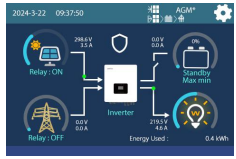
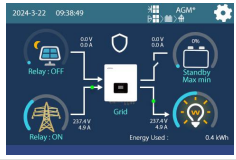
		❷Any of the following is satisfied, the Utility supplies power to the load and charges the battery simultaneously. • The battery voltage is lower than or equal to the **AUX ON** value. • The battery SOC is lower than or equal to the **UAC ON** value.

（D-5） PV ☒ Utility ☑	**Charging Mode: "Solar+Grid"**	**Discharging Mode: No impact under any mode**
		The Utility supplies power to the load and charges the battery simultaneously.
	Charging Mode：“Grid > Solar”	**Discharging Mode: No impact under any mode**
		The Utility supplies power to the load and charges the battery simultaneously.

4.2.2 No battery mode

Note: Under the no battery mode, the "Charging Mode" and "Discharging Mode" settings will not take effect.

PV ☑ Utility ☑	 $P_{PV} > P_{LOAD}$ $P_{PV} \leq P_{LOAD}$	❶When the PV power is greater than the load power; the PV supplies power to the load. **Note: In this mode,The Utility still keep a minimum power input. When the PV power is lower than the load power, the Utility can replenish the power supply at any time to avoid device shutdown.**

		❷When the PV power is lower than or equal to the load power, the PV and the Utility supply power to the load together.
PV ☑ Utility ☒		Only the PV supplies power to the load.
PV ☒ Utility ☑		Only the Utility supplies power to the load.

5 Protections

No.	Protections	Instruction
1	PV limit Current/Power	When the PV array's actual charging current/power exceeds its rated current/power, it will charge the battery as per the rated current/power. When the PV voltage exceeds the bus voltage, the PV input power is constrained by the load power, charging power, the power that the solar panels can deliver, and the current of the PV circuit breaker.
2	PV short circuit	When the PV is not charging and short circuit, the inverter/charger is not damaged.
3	PV Reverse Polarity	The inverter/charger will not be damaged when the PV array is reversely connected, correct the wire connection to resume work. **CAUTION:** The total short-circuit current of each PV array must be less than the "PV Maximum Short-circuit Current" (see section 9 Specifications), and the reverse connection time should not exceed 5 minutes. Frequent incorrect wiring is strictly prohibited as it may damage the inverter/charger. **CAUTION:** The PV input terminals must first be connected to a DC circuit breaker with an arc extinguishing function capable of handling 500VDC or higher, and then, connect the PV input terminals to the inverter/charger. If the PV array is reversely connected, it is essential to first disconnect the external circuit breaker, followed by the PV standard terminals, or the PV connection terminals of the inverter/charger. Otherwise, it may result in arcing damage to the PV standard terminals or the inverter/charger.
4	Utility input over-voltage	When the utility voltage exceeds the set value of “UOD (Utility Over Voltage Disconnect Voltage)” the utility will stop charging and supplying the load.
5	Utility input under-voltage	When the utility voltage is lower than the set value of “ULVD (Utility Low Voltage Disconnect Voltage)” the utility will stop charging and supplying the load.
6	Battery over-voltage	When the battery voltage goes higher than the “OVD(Over Voltage Disconnect Voltage),” the PV/Utility will stop charging the battery to protect the battery from being over-charged.

<table>
<tr><th>No.</th><th>Protections</th><th colspan="4">Instruction</th></tr>
<tr><td>7</td><td>Battery over-discharge</td><td colspan="4">When the battery voltage goes lower than the “LVD (Low Voltage Disconnect Voltage),” the battery will stop discharging to protect the battery from being over-discharged.</td></tr>
<tr><td>8</td><td>Battery Reverse Polarity</td><td colspan="4">The inverter/charger will not be damaged when the battery is reversely connected, correct the wire connection to resume work.
⚠ CAUTION: When the PV or Utility is connected, reverse connection of the battery can damage the inverter/charger.</td></tr>
<tr><td>9</td><td>Load output short circuit</td><td colspan="4">The output is turned off immediately in the occurrence of short-circuiting. And then, the output is recovered automatically after a delay time of 5s, 10s, and 15s separately (less than three times recovery within 5 minutes, it will be recounted). The inverter/charger stops working after the 4th protection and can resume working after resetting or restarting.
Clear the fault in time because it may damage the inverter/charger permanently.
Note: Resetting operation--See chapter 2.4.6 Real-time error code and then click the Clear button to exit the current fault state and resume normal operation.</td></tr>
<tr><td>10</td><td>Device overheating</td><td colspan="4">When the internal temperature overheats, the inverter/charger will stop charging/discharging.
The inverter/charger will resume charging/discharging when the internal temperature is normal and the protection time lasts more than 20 minutes.</td></tr>
<tr><td rowspan="3">11</td><td rowspan="3">KR3522-1250P20C
KR3542-0650P20C
KRP3522-1250P20C
KRP3542-0650P20C
inverter overload
(no Utility)</td><td>3605W≤P<4550W</td><td>4550W≤P<5250W</td><td>5250W≤P<7000W</td><td>P≥7000W</td></tr>
<tr><td>Protect after 30 seconds</td><td>Protect after 10 seconds</td><td>Protect after 5 seconds</td><td>Protect immediately</td></tr>
<tr><td colspan="4">Note: The output is recovered automatically after a delay time of 5s, 10s, and 15s separately. The inverter/charger stops working after the 4th protection and can resume working after resetting or restarting.</td></tr>
</table>

No.	Protections	Instruction			
12	KR3522-1250P20C KR3542-0650P20C KRP3522-1250P20C KRP3542-0650P20C Utility bypass overload (no-Battery mode)	3850W≤P<4795W	4795W≤P<5495W	5495W≤P<7000W	P≥7000W
		Protect after 30 seconds	Protect after 10 seconds	Protect after 5 seconds	Protect immediately
		Note: The output is recovered automatically after a delay time of 5s, 10s, and 15s separately. The inverter/charger stops working after the 4th protection and can resume working after resetting or restarting.			
13	KR3522-1250P20C KR3542-0650P20C KRP3522-1250P20C KRP3542-0650P20C Utility bypass overload (Battery mode)	5350W≤P<6295W	6295W≤P<6995W	6995W≤P<8500W	P≥8500W
		Protect after 30 seconds	Protect after 10 seconds	Protect after 5 seconds	Protect immediately
		Note: The output is recovered automatically after a delay time of 5s, 10s, and 15s separately. The inverter/charger stops working after the 4th protection and can resume working after resetting or restarting.			
14	KR5542-1050P20C KRP5542-1050P20C inverter overload (no Utility)	5665W≤P<6600W	6600W≤P<7700W	P≥7700W	
		Protect after 30 seconds	Protect after 10 seconds	Protect immediately	
		Note: The output is recovered automatically after a delay time of 5s, 10s, and 15s separately. The inverter/charger stops working after the 4th protection and can resume working after resetting or restarting.			
15	KR5542-1050P20C KRP5542-1050P20C Utility bypass overload (no-Battery mode)	6050W≤P<6985W	6985W≤P<8085W	P≥8085W	
		Protect after 30 seconds	Protect after 10 seconds	Protect immediately	
		Note: The output is recovered automatically after a delay time of 5s, 10s, and 15s separately. The inverter/charger stops working after the 4th protection and can resume working after resetting or restarting.			

No.	Protections	Instruction		
16	KR5542-1050P20C KRP5542-1050P20C Utility bypass overload (Battery mode)	8550W≤P<9485W	9485W≤P<10585W	P≥10585W
		Protect after 30 seconds	Protect after 10 seconds	Protect immediately
		Note: The output is recovered automatically after a delay time of 5s, 10s, and 15s separately. The inverter/charger stops working after the 4th protection and can resume working after resetting or restarting.		

6 Troubleshooting

CAUTION	After the inverter/charger is powered on, the meter displays the boot screen all the time (unable to enter the home screen) and the red "RUN" indicator flashes. It means the communication with the inverter/charger is error. When the above fault occurs, check whether the communication cable is disconnected. If not, don't hesitate to contact our after-sales engineer.

6.1 Battery faults

No.	Fault/Status	Error code	Indicator	Buzzer	Solution
1	Battery Overvoltage	ER04	--	--	Disconnect the charging connection, and check whether the battery voltage is too high. Verify if the actual battery voltage matches the rated battery voltage; or check if the OVD (Over Voltage Disconnect Voltage) is inconsistent with the battery specifications. After the battery voltage drops below the set value of OVR (Over Voltage Reconnect Voltage), the alarm will automatically be cleared.
2	Battery Undervoltage	ER05			Disconnect the loads connection, and check whether the battery voltage is too low. After the battery voltage is charged and restored to above the "LVR (Low Voltage Reconnect Voltage)," it will automatically return to normal, or use other methods to charge the battery.

No.	Fault/Status	Error code	Indicator	Buzzer	Solution
3	Battery Over Temperature	ER11	--	--	Ensure the battery is installed in a cool and well-ventilated place, check that the battery actual charging and discharging current does not exceed the setting values of "LBACC (Local Battery Available Charging Current) and LBADC (Local Battery Available Discharging Current)." It resumes normal work when the battery cools down to below the "BATT OTPR (Battery Over Temperature Protection Recovery)."
4	Battery Overcurrent	ER37			Check that the battery actual charging and discharging current does not exceed the setting values of "LBACC (Local Battery Available Charging Current) and LBADC (Local Battery Available Discharging Current)."
5	Battery Cable Disconnected	ER39			Check whether the battery connection is normal, and whether the BMS protection occurs.
6	Battery Undervoltage Alarm	ER50			Check if the battery voltage is lower than the “UVW (Under Voltage Warning Voltage).”
7	Battery Connection Failed	ER56			Check if the battery connection is normal and the BMS communication of the lithium battery is normal.

6.2 PV faults

No.	Fault/Status	Error code	Indicator	Buzzer	Solution
1	PV1 Overvoltage	ER15	PV indicator red on	Intermittent beeps	Check if the PV open-circuit voltage is higher than OVP (Over Voltage Protection Voltage). The alarm is released when the PV open-circuit voltage is below OVPR (Over Voltage Protection Reconnect Voltage).
2	PV1 Overcurrent	ER17	PV indicator green on	--	Turn off the inverter/charger first, wait for 5 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
3	PV2 Overvoltage	ER18	PV indicator red on	Intermittent beeps	Check if the PV open-circuit voltage is higher than OVP (Over Voltage Protection Voltage). The alarm is released when the PV open-circuit voltage is below OVPR (Over Voltage Protection Reconnect Voltage).
4	PV2 Overcurrent	ER20	PV indicator green on	--	Turn off the inverter/charger first, wait for 5 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
5	PV Module Hardware Fault	ER30			
6	PV1 Temp Sensor Disconnected	ER43			
7	PV1 Pre-Charge Timeout	ER52	PV indicator green on	--	Turn off the inverter/charger first, wait for 5 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
8	PV2 Pre-Charge Timeout	ER53			

6.3 Inverter faults

No.	Fault/Status	Error code	Indicator	Buzzer	Solution
1	Inverter Output Overcurrent	ER02	LOAD indicator red ON	Intermittent beeps	Check if the load actual power exceeds the "Inverter Rated Power (see chapter 8 Specifications)," disconnect the load completely and turn off the inverter/charger. Wait 5 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
2	Inverter Output Overvoltage	ER07			Check whether the inverter output is higher than the "Over Voltage Protection" (See 2.4.4 Load real-time data, click ***Fun*** to enter the "Setting Parameters To Display" page to view the value of this parameter). Disconnect the load completely and turn off the inverter/charger. Wait 5 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
3	Inverter Over Temperature	ER10	--	--	Ensure the inverter/charger is installed in a cool and well-ventilated place.
4	Inverter Hardware Overvoltage	ER22	--	--	Disconnect the load completely and turn off the inverter/charger. Wait 5 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
5	Inverter Hardware Overcurrent	ER23			
6	Inverter Voltage OFFSET Error	ER32			

No.	Fault/Status	Error code	Indicator	Buzzer	Solution
7	Inverter Current OFFSET Error	ER35	--	--	Disconnect the load completely and turn off the inverter/charger. Wait 5 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
8	Inverter Temp Sensor Disconnected	ER45	LOAD indicator green ON	--	Turn off the inverter/charger.Wait 5 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
9	Inverter Output Undervoltage	ER49	LOAD indicator red ON	Intermitte nt beeps	Check if the load actual power exceeds the "Inverter Rated Power (see chapter 8 Specifications)," disconnect the load completely and turn off the inverter/charger. Wait 5 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
10	Boost Module Over Temperature	ER60	--	--	Ensure the inverter/charger is installed in a cool and well-ventilated place.

6.4 Utility faults

No.	Fault/Status	Error code	Indicator	Buzzer	Solution
1	Utility Overvoltage	ER08	GRID indicator red on	Intermittent beeps	Check if the utility voltage is exceeds the UOD (Utility Over Voltage Disconnect Voltage), then disconnect the AC input and turn off the inverter/charger. Wait 5 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
2	Utility Overcurrent	ER09	red on	Intermittent beeps	Check if the load actual power exceeds the "Inverter Rated Power (see chapter 8 Specifications)," disconnect the load completely and turn off the inverter/charger. Wait 5 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support. Check if the utility voltage is lower than the ULVD (Utility Low Voltage Disconnect Voltage), disconnect the utility input and turn off the inverter/charger. Wait 5 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
3	Utility Undervoltage	ER25	GRID indicator red on	--	
4	Utility Pre-charge Timeout	ER28	GRID indicator green on	--	Check if the utility frequency in between the UFD (Utility Under Frequency Disconnect Frequency) to UOF (Utility Over Frequency Disconnect Frequency) disconnect the utility input and turn off the inverter/charger. Wait 5 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
5	Utility Relay Adhesion	ER29			
6	Utility Frequency Error	ER31	GRID indicator red on	Intermittent beeps	

6.5 Load faults

No.	Fault/Status	Error code	Indicator	Buzzer	Solution
1	Load Current OFFSET Error	ER33	--	--	Disconnect the load completely and turn off the inverter/charger. Wait 5 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
2	Load Over Load	ER48	LOAD indicator red ON	Intermittent beeps	
3	Overload Lockdown	ER55			

6.6 Other faults for single inverter/charger

No.	Fault/Status	Error code	Indicator	Buzzer	Solution
1	DC Bus Overvoltage	ER00	--	--	Turn off the inverter/charger. Wait 5 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
2	DC Bus Undervoltage	ER06			
3	Ambient Over Temperature	ER12	--	--	Ensure the inverter/charger is installed in a cool and well-ventilated place. Please inspect the anti-dust kit, and clean it if necessary.
4	Battery or Bus Hardware Overvoltage	ER21	--	--	Turn off the inverter/charger. Wait 5 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
5	High Volt Bus Hardware Overcurrent	ER24			
6	High Volt Bus Current Abnormal	ER36			
7	Boost Drive Error	ER38			
8	Auxiliary Power Supply Abnormal	ER40			

No.	Fault/Status	Error code	Indicator	Buzzer	Solution
9	Environment Temp Sensor Disconnected	ER42	--	--	Turn off the inverter/charger. Wait 5 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.
10	Low Temperature Charging Limit	ER46	--	--	Check whether the ambient temperature is lower than the set "LTSChrg (Low Temperature Stop Charging Temperature) and LTSDischrg (Low Temperature Stop Discharging Temperature)."
11	Low Temperature Discharging Limit	ER47			
12	EEprom Abnormal	ER54	--	--	Turn off the inverter/charger. Wait 5 minutes and then turn on the inverter/charger to check if it resumes normal. If it is still abnormal, please contact our technical support.

6.7 BMS faults

No.	Fault/Status	Error code	Indicator	Buzzer	Solution
1	BMS Overvoltage	ER66	--	--	Check the BMS communication status or BMS setting parameters.
2	BMS Charging Temp Abnormal	ER68			
3	BMS Undervoltage	ER69			
4	BMS Discharging Temp Abnormal	ER71			
5	BMS Communication Failure	ER74			

7 Maintenance

1. **To prevent frequent over-heat protection of the inverter/charger, which may affect system reliability, it is recommended to clean the anti-dust kit once a month. In environments with high temperatures and severe dust pollution, it is advisable to clean the anti-dust kit every two weeks. It is also recommended to replace the anti-dust kit annually.**

2. **The following inspections and maintenance tasks are recommended at least twice yearly for best performance.**

- Make sure no block on airflow around the inverter/charger. Clear up dirt and fragments on the radiator.
- Check all the wired cables to ensure insulation is not damaged for serious solarization, frictional wear, dryness, insects or rats, etc. Repair or replace some wires if necessary.
- Check and confirm that LED or LCD is consistent with the required. Pay attention to any troubleshooting or error indication. Take necessary corrective action.
- Confirm that all the terminals have no corrosion, insulation damage, high temperature, or burnt/discolored sign; tighten terminal screws to the suggested torque.
- Check for dirt, nesting insects, and corrosion. If so, clear up in time.
- Check and confirm that the lightning arrester is in good condition. Replace a new one in time to avoid damaging the inverter/charger and other equipment.

 **WARNING**	Risk of electric shock! Turn off all the power before the above operations and follow the corresponding inspections and operations.

8 Specifications

8.1 KR-P20C Series

Model	KR3542-0650P20C	KR5542-1050P20C
Utility input		
Utility Input Voltage	176VAC to 264VAC (Default), 90VAC to 285VAC (Configurable)	
Utility Input Frequency	45Hz to 65Hz	
Maximum Utility Charging Current	60A	100A
Switch Response Time	Switch Response Time – Inverter to Utility: 10ms Switch Response Time – Utility to Inverter (when the load power is higher than 100W): 20ms	
Inverter output		
Inverter Rated Power (@30℃)	3500W	5500W
3-second Transient Surge Output Power	7000W	8500W
Inverter Output Voltage	220/230VAC±3%	
Inverter Frequency	50/60Hz±0.2%	
Output Voltage Waveform	Pure sine wave	
Load Power Factor	0.2 – 1(VA ≤ Rated output power)	
THDu (Total Harmonic Voltage Distortion)	≤3% (48V resistive load)	
Maximum Load Efficiency	92%	92%
Maximum Inverter Efficiency	94%	94%
Maximum Main Load	3500W	5500W
Maximum Second Load	3500W	5500W
Main Output Cut-Off Voltage	Equal to “UVW (Under Voltage Warning Voltage)”	
Second Output Cut-Off Voltage	Equal to “LVD (Low Voltage Disconnect Voltage)”	
Dual Output Recovery Voltage	Equal to “LVR (Low Voltage Reconnect Voltage)”	
Solar controller		
PV Maximum Open-circuit Voltage	500V (At minimum operating environment temperature) 440V (At 25℃)	
MPPT Voltage Range	85V to 450V	
Number of MPPTs	1	2
PV Maximum Input Current	One way, 16A/way	Two ways, 2x16A
PV Maximum Short-circuit Current	One way, 18A/way	Two ways, 2x18A
PV Maximum Input Power	4200W	2×3300W

PV Maximum Charging Current	60A	100A
MPPT Maximum efficiency	≥99.5%	
Battery		
Battery Rated Voltage	48VDC	
Battery Work Voltage Range	40.8VDC to 64.0VDC	
Battery Maximum Charging Current	60A	100A
Others		
No-load Losses	≤0.8A	≤1.1A
	Test condition: Utility, PV and Load are disconnected, AC output is ON, fan stops, @48V input	
Standby Current	≤0.6A	≤0.8A
	Test condition: Utility, PV and Load are disconnected, AC output is OFF, fan stops, @48V input	
Communication with BMS	RS485	
Communication with Portal	RS485	
Parallel Function	Yes, 12 units in standard, 16 units at most	
Work Temperature Range	-20℃ to +50℃ (When the environment temperature exceeds 30℃, the actual output power is reduced appropriately)	
Storage Temperature Range	-25℃ to +60℃	
Enclosure	IP20 (With ANTI-DUST KIT)	
Relative Humidity	< 95% (N.C.)	
Altitude	<4000M (If the altitude exceeds 2000 meters, the actual output power is reduced appropriately)	
Certifications and Standards	IEC 62109-1, IEC 62109-2, IEC 61683, IEC 62368	
Mechanical parameters		
Dimension (Length x Width x Height)	534mm × 300mm × 163mm	590mm × 300mm × 163mm
Mounting size (Length x Width)	512mm × 245mm	568mm × 245mm
Mounting hole size	Φ9mm/Φ10mm	Φ9mm/Φ10mm
Net Weight	12.7Kg	15.5Kg

Model	**KR3522-1250P20C**
Utility input	
Utility Input Voltage	176VAC to 264VAC (Default), 90VAC to 285VAC (Configurable)
Utility Input Frequency	45Hz to 65Hz
Maximum Utility Charging Current	110A
Switch Response Time	Switch Response Time – Inverter to Utility: 10ms Switch Response Time – Utility to Inverter (when the load power is higher than 100W): 20ms

Inverter output	
Inverter Rated Power (@30℃)	3500W
3-second Transient Surge Output Power	7000W
Inverter Output Voltage	220/230VAC±3%
Inverter Frequency	50/60Hz±0.2%
Output Voltage Waveform	Pure sine wave
Load Power Factor	0.2 – 1(VA ≤ Rated output power)
THDu (Total Harmonic Voltage Distortion)	≤3% (24V resistive load)
Maximum Load Efficiency	92%
Maximum Inverter Efficiency	94%
Maximum Main Load	3500W
Maximum Second Load	3500W
Main Output Cut-Off Voltage	Equal to “UVW (Under Voltage Warning Voltage)”
Second Output Cut-Off Voltage	Equal to “LVD (Low Voltage Disconnect Voltage)”
Dual Output Recovery Voltage	Equal to “LVR (Low Voltage Reconnect Voltage)”
Solar controller	
PV Maximum Open-circuit Voltage	500V (At minimum operating environment temperature) 440V (At 25℃)
MPPT Voltage Range	85V to 450V
Number of MPPTs	1
PV Maximum Input Current	One way, 16A/way
PV Maximum Short-circuit Current	One way, 18A/way
PV Maximum Input Power	4200W
PV Maximum Charging Current	120A
MPPT Maximum efficiency	≥99.5%
Battery	
Battery Rated Voltage	24VDC
Battery Work Voltage Range	20.4VDC to 32.0VDC
Battery Maximum Charging Current	120A
Others	
No-load Losses	≤1.5A
	Test condition: Utility, PV and Load are disconnected, AC output is ON, fan stops, @24V input
Standby Current	≤1.1A
	Test condition: Utility, PV and Load are disconnected, AC output is OFF, fan stops, @24V input
Communication with BMS	RS485

Communication with Portal	RS485
Parallel Function	Yes, 12 units in standard, 16 units at most
Work Temperature Range	-20℃ to +50℃ (When the environment temperature exceeds 30℃, the actual output power is reduced appropriately)
Storage Temperature Range	-25℃ to +60℃
Enclosure	IP20 (With ANTI-DUST KIT)
Relative Humidity	< 95% (N.C.)
Altitude	<4000M (If the altitude exceeds 2000 meters, the actual output power is reduced appropriately)
Certifications and Standards	IEC 62109-1, IEC 62109-2, IEC 61683, IEC 62368
Mechanical parameters	
Dimension (Length x Width x Height)	590mm × 300mm × 163mm
Mounting size (Length x Width)	568mm × 245mm
Mounting hole size	Φ9mm/Φ10mm
Net Weight	13.8Kg

8.2 KRP-P20C Series

Model	KRP3542-0650P20C	KRP5542-1050P20C
Utility input		
Utility Input Voltage	176VAC to 264VAC (Default), 90VAC to 285VAC (Configurable)	
Utility Input Frequency	45Hz to 65Hz	
Maximum Utility Charging Current	60A	100A
Switch Response Time	Switch Response Time – Inverter to Utility: 10ms Switch Response Time – Utility to Inverter (when the load power is higher than 100W): 20ms	
Inverter output		
Inverter Rated Power (@30℃)	3500W	5500W
3-second Transient Surge Output Power	7000W	8500W
Inverter Output Voltage	220/230VAC±3%	
Inverter Frequency	50/60Hz±0.2%	
Output Voltage Waveform	Pure sine wave	
Load Power Factor	0.2 – 1(VA ≤ Rated output power)	
THDu (Total Harmonic Voltage Distortion)	≤3% (48V resistive load)	
Maximum Load Efficiency	92%	92%
Maximum Inverter Efficiency	94%	94%
Maximum Main Load	3500W	5500W

Maximum Second Load	3500W	5500W
Main Output Cut-Off Voltage	Equal to “UVW (Under Voltage Warning Voltage)”	
Second Output Cut-Off Voltage	Equal to “LVD (Low Voltage Disconnect Voltage)”	
Dual Output Recovery Voltage	Equal to “LVR (Low Voltage Reconnect Voltage)”	
Solar controller		
PV Maximum Open-circuit Voltage	500V (At minimum operating environment temperature) 440V (At 25℃)	
MPPT Voltage Range	85V to 450V	
Number of MPPTs	1	2
PV Maximum Input Current	One way, 20A/way	Two ways, 2x20A
PV Maximum Short-circuit Current	One way, 22A/way	Two ways, 2x22A
PV Maximum Input Power	4200W	2×3300W
PV Maximum Charging Current	60A	100A
MPPT Maximum efficiency	≥99.5%	
Battery		
Battery Rated Voltage	48VDC	
Battery Work Voltage Range	40.8VDC to 64.0VDC	
Battery Maximum Charging Current	60A	100A
Others		
No-load Losses	≤0.8A	≤1.1A
	Test condition: Utility, PV and Load are disconnected, AC output is ON, fan stops, @48V input	
Standby Current	≤0.6A	≤0.8A
	Test condition: Utility, PV and Load are disconnected, AC output is OFF, fan stops, @48V input	
Communication with BMS	RS485	
Communication with Portal	RS485	
Parallel Function	Yes, 12 units in standard, 16 units at most	
Work Temperature Range	-20℃ to +50℃ (When the environment temperature exceeds 30℃, the actual output power is reduced appropriately)	
Storage Temperature Range	-25℃ to +60℃	
Enclosure	IP20 (With ANTI-DUST KIT)	
Relative Humidity	< 95% (N.C.)	
Altitude	<4000M (If the altitude exceeds 2000 meters, the actual output power is reduced appropriately)	
Certifications and Standards	IEC 62109-1, IEC 62109-2, IEC 61683, IEC 62368	
Mechanical parameters		
Dimension (Length x Width x Height)	534mm × 300mm × 163mm	590mm × 300mm × 163mm

Mounting size (Length x Width)	512mm × 245mm	568mm × 245mm
Mounting hole size	Φ9mm/Φ10mm	Φ9mm/Φ10mm
Net Weight	12.7Kg	15.5Kg

Model	**KRP3522-1250P20C**
Utility input	
Utility Input Voltage	176VAC to 264VAC (Default), 90VAC to 285VAC (Configurable)
Utility Input Frequency	45Hz to 65Hz
Maximum Utility Charging Current	110A
Switch Response Time	Switch Response Time – Inverter to Utility: 10ms Switch Response Time – Utility to Inverter (when the load power is higher than 100W): 20ms
Inverter output	
Inverter Rated Power (@30℃)	3500W
3-second Transient Surge Output Power	7000W
Inverter Output Voltage	220/230VAC±3%
Inverter Frequency	50/60Hz±0.2%
Output Voltage Waveform	Pure sine wave
Load Power Factor	0.2 – 1(VA ≤ Rated output power)
THDu (Total Harmonic Voltage Distortion)	≤3% (24V resistive load)
Maximum Load Efficiency	92%
Maximum Inverter Efficiency	94%
Maximum Main Load	3500W
Maximum Second Load	3500W
Main Output Cut-Off Voltage	Equal to “UVW (Under Voltage Warning Voltage)”
Second Output Cut-Off Voltage	Equal to “LVD (Low Voltage Disconnect Voltage)”
Dual Output Recovery Voltage	Equal to “LVR (Low Voltage Reconnect Voltage)”
Solar controller	
PV Maximum Open-circuit Voltage	500V (At minimum operating environment temperature) 440V (At 25℃)
MPPT Voltage Range	85V to 450V
Number of MPPTs	1
PV Maximum Input Current	One way, 20A/way
PV Maximum Short-circuit Current	One way, 22A/way
PV Maximum Input Power	4200W
PV Maximum Charging Current	120A

MPPT Maximum efficiency	≥99.5%
Battery	
Battery Rated Voltage	24VDC
Battery Work Voltage Range	20.4VDC to 32.0VDC
Battery Maximum Charging Current	120A
Others	
No-load Losses	≤1.5A
	Test condition: Utility, PV and Load are disconnected, AC output is ON, fan stops, @24V input
Standby Current	≤1.1A
	Test condition: Utility, PV and Load are disconnected, AC output is OFF, fan stops, @24V input
Communication with BMS	RS485
Communication with Portal	RS485
Parallel Function	Yes, 12 units in standard, 16 units at most
Work Temperature Range	-20℃ to +50℃ (When the environment temperature exceeds 30℃, the actual output power is reduced appropriately)
Storage Temperature Range	-25℃ to +60℃
Enclosure	IP20 (With ANTI-DUST KIT)
Relative Humidity	< 95% (N.C.)
Altitude	<4000M (If the altitude exceeds 2000 meters, the actual output power is reduced appropriately)
Certifications and Standards	IEC 62109-1, IEC 62109-2, IEC 61683, IEC 62368
Mechanical parameters	
Dimension (Length x Width x Height)	590mm × 300mm × 163mm
Mounting size (Length x Width)	568mm × 245mm
Mounting hole size	Φ9mm/Φ10mm
Net Weight	13.8Kg

9 Appendix

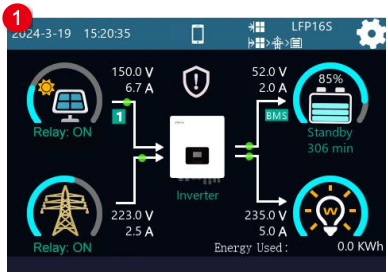
9.1 Appendix1 Abbreviations index

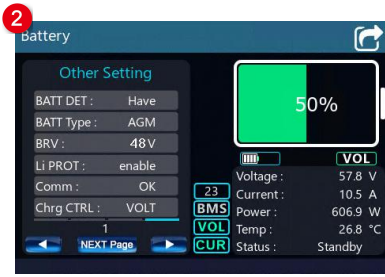
LCD	Abbreviations	Full name in English
Solar Setting Parameter	OVP	Over Voltage Protection Voltage
	OVPR	Over Voltage Protection Reconnect Voltage
	UVP	Under Voltage Protection Voltage
	UVPR	Under Voltage Protection Reconnect Voltage
	OTP	Over Temperature Protection Temperature
	OTPR	Over Temperature Protection Recovery Temperature
Voltage Control Strategy	OVD	Over Voltage Disconnect Voltage
	CLV	Charging Voltage Limit Voltage
	OVR	Over Voltage Reconnect Voltage
	ECV	Equalize Charging Voltage
	BCV	Boost Charging Voltage
	FCV	Float Charging Voltage
	BVR	Boost Voltage Reconnect Voltage
	LVR	Low Voltage Reconnect Voltage
	UVWR	Under Voltage Warning Recovery Voltage
	UVW	Under Voltage Warning Voltage
	LVD	Low Voltage Disconnect Voltage
	DLV	Discharging Voltage Limit Voltage
	AUX OFF	Auxiliary module OFF voltage
	AUX ON	Auxiliary module ON voltage
SOC Control Strategy	FCP	Full Charging Protection SOC
	FCPR	Full Charging Protection Recovery SOC
	LPAR	Low Power Alarm Recovery SOC
	LPA	Low Power Alarm SOC
	DPR	Discharging Protection Recovery SOC
	DP	Discharging Protection SOC
	UAC ON	Utility Charging ON SOC
	UAC OFF	Utility Charging OFF SOC
	Set SOC	Set SOC

Grid Setting Parameter	UOD	Utility Over Voltage Disconnect Voltage
	UOR	Utility Over Voltage Reconnect Voltage
	ULVD	Utility Low Voltage Disconnect Voltage
	ULVR	Utility Low Voltage Reconnect Voltage
	UOF	Utility Over Frequency Disconnect Frequency
	UFD	Utility Under Frequency Disconnect Frequency
Load Setting Parameter	INVOVL	Inverter Output Voltage Level
	INVOFR	Inverter Output Frequency Range
	Load CL	Load Current Limit
	INVOP	Inverter Over Voltage Protection Voltage
	INVOPR	Inverter Over Voltage Protection Recovery Voltage
	TempUL	Temperature Upper Limit
	TempULR	Temperature Upper Limit Recovery
Battery Basic Properties	Status	Battery Status
	BDCap	Battery Design Capacity
	BType	Battery Type
	BRV	Battery Voltage
	LBACC	Local Battery Available Charging Current
	LBADC	Local Battery Available Discharging Current
	BECT	Battery Equalize Charging Time
	BECD	Battery Equalize Charging Date
	BBCT	Battery Boost Charging Time
	BTCC	Battery Temperature Compensation Coefficient
Advanced Battery Properties	Li PROT	Lithium Battery Protection
	LTSChrg	Low Temperature Stop Charging Temperature
	LTSDischrg	Low Temperature Stop Discharging Temperature
	BATT OTP	Battery Over Temperature Protection
	BATT OTPR	Battery Over Temperature Protection Recovery
	Chrg	Charging
	Dischrg	Discharging
	PCUP	Phase Current Unbalance Protection
	INVPSet	Inverter Phase Setting
	UCD	Unbalanced Current Difference
	PWRSave	Power Saving
	PWRSDT	Power Saving Detection Time
Charge and Discharge	BACC	Battery Available Charging Current
	BADC	Battery Available Discharging Current

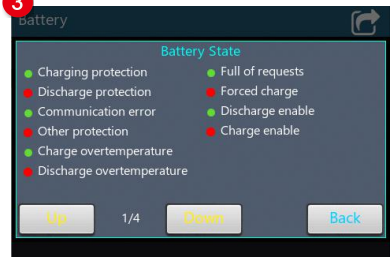
Management	UACC	Utility Available Charging Current
	CMode	Charging Mode
	DMode	Discharge Mode
	ACmode	AC Input Mode
	PVMode	PV Mode
	BCCMode	Battery Charging Control Mode
	BMSProt	BMS Protocol
	BMS	BMS Enable
	BMSVolt	BMS Voltage Control
	BMSCurr	BMS Current Control
	BMSFail	BMS Fail Action
	BCM	Battery Connection Method
Local Parameters	LCD BRT	LCD Brightness
	TODelay	Idle Timeout Delay
	LCDSBRT	Standby LCD Brightness
	SOT	Screen Off Time
	Com ID	Communication ID
	Com BPS	Communication Baud Rate
	DCT ON	Dry Contract ON Voltage
	DCT OFF	Dry Contract OFF Voltage
	Switch BMS	Switch BMS
	HRI	History Record Interval
Others	Wireless	Wireless
	RTU Power	RTU Power
	Screen TO	Screen Timeout
	Parameter Rest	Parameter Rest
	Low Power Mode	Low Power Mode
	Manual Equalizer	Manual Equalizer
	DC Source Characteristic	DC Source Characteristic
	Initializing Records	Initializing Records
	Clear Statistical Power	Clear Statistical Power

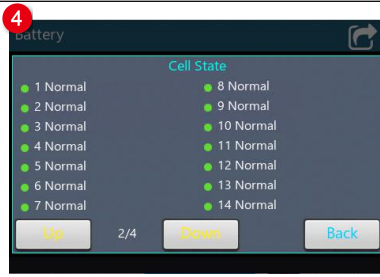
9.2 Appendix 2 Battery state instruction



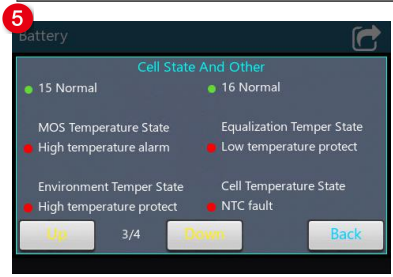


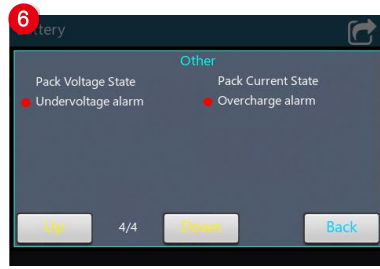
1. On the screen, click the battery icon  to enter the battery real-time data screen.	2. Touch the  to enter the battery state screen.





3. The first page shows the “Battery State.”	4. Click ***Down*** button to shows the "Cell State" on second page.





5. Click ***Down*** button to shows the "Cell State And Other" on third pages.	6. Click ***Down*** button to shows the "Other" on forth pages.

The detailed data of each interface is as follows:

LCD	English display	Description
Battery State	Charging protection	Green means this state has not occurred, red means this state has occurred. After showing red, the inverter/charger turns off charging.
	Discharge protection	Green means this state has not occurred, red means this state has occurred. After showing red, the inverter/charger turns off discharging.
	Communication Error	The communication between BMS-Link and lithium battery BMS fails (such as wrong protocol selection, mismatched communication cables, etc.). Green means this state has not occurred, red means this state has occurred. After showing red, the inverter/charger turns off charging and discharging.
	Other protection	Green means this state has not occurred, red means this state has occurred. After showing red, the inverter/charger turns off the charging and discharging.
	Charge overtemperature	Green means this state has not occurred, red means this state has occurred. After showing red, the inverter/charger turns off charging.
	Discharge overtemperature	Green means this state has not occurred, red means this state has occurred. After showing red, the inverter/charger turns off discharging.
	Full of requests Forced charge	Green means this state has not occurred, red means this state has occurred.
	Discharge Enable	Green means discharging is enabled. Red means discharging is disabled. After showing red, the inverter/charger turns off discharging.
	Charge Enable	Green means charging is enabled. Red means charging is disabled. After showing red, the inverter/charger turns off charging.
Cell State	1 Normal to 14 Normal	If it is detected that the current single battery cell is normal or there is no battery cell, it will display green; if the current battery cell is abnormal, the display will turn red. The abnormal status of a single battery cell includes: Undervoltage alarm, Overvoltage alarm, Undervoltage
Cell State And Other	15 Normal to 16 Normal	

		proterct, Overvoltage protect, and Cell detection. After reading the undervoltage alarm or protection of the single cell, the inverter/charger turns off discharging. After reading the overvoltage alarm or protection of the single cell, the inverter/charger turns off charging.
	MOS Temperature State	Normal display is green, abnormal display is red. Abnormal status includes: High temperature alarm, Low temperature alarm, High temperature protect, Low temperature protect, NTC fault. The inverter/charger turns off charging and discharging.
	Environment Temper State	
	Equalization Temper State	
	Cell Temperature State	
Other	Pack Voltage State Undervoltage alarm	Normal display is green, abnormal display is red. Abnormal status includes: Undervoltage alarm, Overvoltage alarm, Undervoltage proterct, Overvoltage protect. After reading the BMS under-voltage alarm or protection, the inverter/charger turns off discharging. After reading the BMS over-voltage alarm or protection, the inverter/charger turns off charging.
	Pack Current State Overcharge alarm	Normal display is green, abnormal display is red. Abnormal status includes: Overrelease alarm, Overcharge alarm, Overdischarge protection, Overcharge protection. After reading the BMS over-discharge alarm or protection, the inverter/charger turns off discharging. After reading the BMS overcharge alarm or protection, the inverter/charger turns off charging.

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