

# Inverter/charger

# **User Manual**



UC3522-1250P20, UCP3522-1250P20 UC3542-0650P20, UCP3542-0650P20 UC5542-1050P20, UCP5542-1050P20

## Contents

Important Safety Instructions	1
Disclaimers	5
1 General Information	6
1.1 Overview	6
1.2 Appearance	9
1.3 Naming rules	
1.4 Connection diagram	13
2 Interface	15
2.1 Indicator	
2.2 Buttons	
2.3 Home screen	17
2.4 Interface	18
2.4.1 Real-time data interface	
2.4.2 User interface	
2.4.3 Administrator interface	21
2.5 Parameters setting	22
2.5.1 Parameters list	22
2.5.2 Battery work modes	
2.5.3 Battery voltage control parameters (Smart)	
2.5.4 Battery voltage control parameters (Expert)	45
2.5.5 Time setting	49
2.5.6 Password modifying	49
3 Single Installation	50
3.1 Attention	50
3.2 Wire and breaker size	51

	3.3 Mounting the inverter/charger	53
	3.4 Wiring the inverter/charger	54
	3.5 Operate the inverter/charger	64
4 \	Working modes	65
	4.1 Abbreviation	65
	4.2 Off-Grid working modes	66
	4.2.1 Battery mode	66
	4.2.2 No battery mode	72
	4.3 On-Grid working modes	73
	4.3.1 On-Grid operation procedure	73
	4.3.2 Battery mode	73
	4.3.3 No battery mode	75
5	Protections	76
6 .	Troubleshooting	79
6 .	6.1 Battery faults	<b>79</b> 79
6	6.1 Battery faults	<b>79</b> 79 80
6	Troubleshooting         6.1 Battery faults         6.2 PV faults	79 79 80 82
6	Troubleshooting 6.1 Battery faults 6.2 PV faults 6.3 Inverter faults 6.4 Utility faults	79 79 80 82 84
6	Troubleshooting 6.1 Battery faults 6.2 PV faults 6.3 Inverter faults 6.4 Utility faults 6.5 Load faults	79 79 80 82 84 85
6	Troubleshooting.         6.1 Battery faults.         6.2 PV faults.         6.3 Inverter faults.         6.4 Utility faults.         6.5 Load faults.         6.6 Other faults for single inverter/charger.	79 79 80 82 84 85 86
6	Troubleshooting.         6.1 Battery faults.         6.2 PV faults.         6.3 Inverter faults.         6.4 Utility faults.         6.5 Load faults.         6.6 Other faults for single inverter/charger.         6.7 BMS faults.	79 79 80 82 84 85 86 87
6 <sup>.</sup>	Troubleshooting.         6.1 Battery faults.         6.2 PV faults.         6.3 Inverter faults.         6.4 Utility faults.         6.5 Load faults.         6.6 Other faults for single inverter/charger.         6.7 BMS faults.         Maintenance.	79 79 80 82 84 85 86 87 88
6 <sup>-</sup> 7   8 :	Troubleshooting.         6.1 Battery faults.         6.2 PV faults.         6.3 Inverter faults.         6.4 Utility faults.         6.5 Load faults.         6.6 Other faults for single inverter/charger.         6.7 BMS faults.         Maintenance.         Specifications.	79 79 80 82 84 85 86 88 89
6 <sup>-</sup> 7   8 :	Troubleshooting.         6.1 Battery faults.         6.2 PV faults.         6.3 Inverter faults.         6.4 Utility faults.         6.5 Load faults.         6.6 Other faults for single inverter/charger.         6.7 BMS faults.         Maintenance.         8.1 UC Series.	79 79 80 82 84 85 87 88 89 89
6 <sup>-</sup> 7   8 \$	Troubleshooting.         6.1 Battery faults.         6.2 PV faults.         6.3 Inverter faults.         6.4 Utility faults.         6.5 Load faults.         6.6 Other faults for single inverter/charger.         6.7 BMS faults.         Maintenance.         Specifications.         8.1 UC Series.         8.2 UCP Series.	79 79 80 82 84 85 86 87 88 89 89 

## **Important Safety Instructions**

### Please reserve this manual for future review.

This manual contains all the safety, installation, and operation instructions for the UC/UCP 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
Тір	Indicates any practical advice for reference
0	<b>IMPORTANT:</b> 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.
4	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.
Ĩ	Read the user manual carefully before any operation.



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

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.
<ul> <li>When installing or moving the inverter/charger, follow the instructions in the manual.</li> <li>When installing the inverter/charger, end-users must evaluate whether the operation area exists arc danger.</li> </ul>
Keep the inverter/charger out of the reach of children.

### 5. Safety cautions for mechanical installation

•	Before installation, confirm the inverter/charger has no electrical connection.		
4	Ensure enough heat dissipation space for the inverter/charger before installation.		
WARNING	• 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

	• 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 <sup>2</sup>		
CAUTION	• 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.		
Do NOT connect the inverter/charger to another power source			
	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.		
<u>7</u>	• It is strictly forbidden to connect a transformer or a load with a surge power (VA)		
WARNING	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.
	<ul> <li>When the inverter/charger is working, please do not open the inverter/charger cabinet to operate.</li> <li>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.</li> </ul>

#### 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.



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.



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.



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



## 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

UC/UCP series, upgraded hybrid 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 large lattice LCD screen 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/ on grid 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.
- · Equipped with simple On-Grid function
- Parallel operation in single phase or three phase for 12 units in standard application, up to 16 units in parallel $^{(1)}$ .
- · 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 utilization<sup>2</sup>.
- Supports charging from multiple types of generators<sup>3</sup>.
- · 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 recording<sup>(4)</sup>, up to 25000.
- Multiple LED indicators show system status in real-time.
- One-button control of AC output.
- · Large size LCD display for better status monitoring.
- RS485 communication interface with optional WiFi, Bluetooth, TCP, or 4G module for remote monitoring.
- · Three-stage charging method to ensure battery safety.
- Lithium battery communication port to perform the safe charging and discharging.
- Comprehensive electronic protection.
- -20°C to +50°C 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 <u>7 Maintenance</u>).

1) More than 12 units need to be customized.

- (2) Only the UC5542-1050P20 and UCP5542-1050P20 support two PV input 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 "PV mode" as "ALL 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 "PV mode" as "ALL MULTIPLE." When there is only one PV array, the "PV mode" is "ALL SINGLE" by default, The "ALL MULTIPLE" is invalid.
- (3)When 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 "AC Input mode" needs to be set to the "Generator." For specific setting, refer to chapter <u>2.5.1 Parameters list</u>.
- (④) The 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 (°C), Boost Module Temperature(°C), INV Module Temperature(°C), Maximum BAT Volt(V), Minimum BAT Volt(V).

### 1.2 Appearance

• UC3522-1250P20/UCP3522-1250P20/UC3542-0650P20/UCP3542-0650P20



• UC5542-1050P20/UCP5542-1050P20



No.	Instruction	No.	Instruction
0	LCD (see chapter 3)	8	Dry contact interface <sup>(2)</sup>
0	Grounding terminal	9	RS485 port (RJ45, with isolation design) <sup>(3)</sup> 5VDC/200mA
8	AC input port	0	PV terminals
4	AC output second load interface	0	Power switch
6	AC output main load interface	Ø	Battery terminals
6	Utility over-current protector		Parallel connection interface <sup>(4)</sup>
0	BMS port(RJ45, with isolation design) <sup>(1)</sup>	6	

(1) This inverter/charger integrates 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 BMS ma	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 UC series



### • Naming rules for UCP series



### 1.4 Connection diagram

### No battery mode



#### Battery mode



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.

Indicator	Status	Instruction	
	OFF	No PV input	
PV	Green ON	PV normal	
	Red ON	PV charging fault (PV1/PV2 over voltage)	
	OFF	No inverter output	
	Green ON	Inverter, charging, and bypass are normal	
LOAD	Red ON	Inverter fault (inverter over current/over voltage/under voltage output short-circuit and over load)	
	OFF	No utility input	
	Green ON	Utility normal	
GRID	Green flashing (1Hz)	Oil generator charging	
	Red ON	Utility charging fault (Utility over voltage/ over current/under voltage/frequency abnormal)	
	Green flashing (1Hz)	Normal communication	
RUN	Red flashing (1Hz)	Communication fault	

### 2.1 Indicator

### 2.2 Buttons

Buttons	Operation	Instruction
ی ESC	Click	<ul> <li>Exit the current interface.</li> <li>Switch from the "home screen" to the "Main Table Data Information" screen.</li> </ul>
	Click	<ul> <li>Browse interface: Up/Down.</li> <li>Parameters setting interface: Increase or decrease the parameter value per step size.</li> </ul>
UP / DOWN	Press and hold	Parameters setting interface: Increase or decrease the parameter value per 10 times the step size.
<b>←</b> ENTER	Click	<ul> <li>Click on the Home screen to enter the real-time data screen</li> <li>Click on the parameter browse interface to enter the parameter setting interface.</li> <li>Confirm the setting parameters.</li> </ul>
	Press and hold	Press and hold on the home screen to enter the password interface. After verifying the password, enter the parameter browse interface.
ل AC OUT	Click	Click on the time or password setting interface to move the cursor left.
	Press and hold	Press and hold on the home screen to turn on/off the inverter output, the utility charging, or the utility bypass.

### 2.3 Home screen



No.	Instruction
	Display the system time, current battery type, and charging stage. When the BMS
0	communication is normal, the icon $BMS$ will be shown on the far right, while when it is
	abnormal, the icon BMS will be shown on the same position.
0	PV icon: PV connection is normal. No PV connection (or at night).
	Actual PV voltage / total PV power
8	Utility icon: $\widetilde{\mathcal{A}}$ Utility connection is normal. $\widetilde{\mathcal{A}}$ No utility connection.
	Utility input voltage / Utility input power
	Status: When there are no faults, it displays "OK." When faults occur, it displays the
	minimum fault code.
<b>U</b>	Note: On the home screen, click the "UP/DOWN" button to select the "Status" bar, and
	click the "ENTER" button to check the detailed fault.
6	Load icon: 🍧 AC output is normal. 🗧 No AC output.
	AC output voltage / AC output power
	Battery status: 4 The battery is discharging.
9	> The battery is being charged.

	Battery voltage / battery current / lithium battery real-time SOC (display "" without lithium		
	battery)		
9	Parallel status icon. It shows when there is two or more inverter/chargers connect in		
•	parallel successfully, and it will not display on the single inverter/charger.		

★ When the PV array or the Utility charges the battery, the equalizing charging is performed on the 28th of each month by default (the date can be modified).

Parallel status icon name rule:



Note: The master and slave units are randomly defined.

### 2.4 Interface

### 2.4.1 Real-time data interface

After powering on the inverter/charger, the home screen shows up. Click the "ENTER" button to enter the real-time data screen. Click the "ENTER" button to enter the next real-time screen, click the "UP/DOWN" button to browse all parameters on current screen, or click the "ESC" button to return the home screen.



### 2.4.2 User interface

After powering on the inverter/charger, the home screen shows up. Click the "ESC" button to enter the "Main Table Data Information" screen. Click the "ENTER" button to enter the next interface, or click the "UP/DOWN" button to browse the current screen display.



#### > "User Data Setup" interface

The end-users can modify common parameters on the "User Data Setup" interface without inputting the

password. The default parameters and setting range refer to chapter 2.5.1 Parameters list.

### 2.4.3 Administrator interface

After powering on the inverter/charger, the home screen shows up. Press and hold the "ENTER" button to enter the password interface. Input the password correctly (0000 by default) to check all parameters or modify them.



### 2.5 Parameters setting

### 2.5.1 Parameters list

Set Data Navigation				
1.	PV	Data Setup	1	
2.	Load	Data Setup	L	
3.	Utility	Data Setup	L	
4.	Battery	Data Setup	L	
5.	Basic	Param Setup	L	
6.	Sys	Param Setup	L	
7.	Sys	DataTime Setup	L	
8.	PassWord	Setun	J	

Enter the "Set Data Navigation" interface according to chapter <u>2.4.3</u> <u>Administrator interface</u>. Then click the "UP/DOWN" button to select navigation 1-9 for detail settings. Default parameters and setting ranges are shown in the following table.

Note: On the parameter setting interface, click the "UP/DOWN" button to increase/decrease the parameter value by one step size

(step size is the minimum unit to modify the parameter). Press and hold the "UP/DOWN" button to increase/decrease the parameter value by ten times the step size (Except for "BAT Capacity" and "Log Data Interval", these values will be increased/decreased by 100 times the step size). Press the "ENTER" button to confirm.

Parameters	Default	User define	
1. PV Data Setup			
UnderVolProtect (PV Under Voltage Protect Voltage)	80.0V	User define: 80.0V to (PV Under Voltage Recover Voltage minus 5V), step size: 0.1V	
UnderVoltRecover (PV Under Voltage Recover Voltage)	100.0V	User define: 100.0V to 200.0V, or (PV Under Voltage Protect Voltage plus 5V) to 200.0V, step size: 0.1V Note: Take the maximum value between 100.0V and (PV Under Voltage Protect Voltage plus 5V).	
2. Load Data Setup			
Output) (althewal (Output valtage			

OutputVoltLevel (Output voltage level)	220V	User define: 220V/230V
OutputFrequency (Output Frequency)	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 output frequency 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 Data Setup page again to check if the change has been changed).

Parameters	Default	User define
UnbalanceSet (Current unbalance set)	DISABLE	User define: DISABLE, ENABLE Note: The parameter will only take effect when used in three phase. After restoring to factory settings, the default value is the last modified value.
Phase Set	Single	User define: Single, Phase A, Phase B, Phase C Note: After phase set is changed, must turn off the inverter charger for 10 seconds before restarting. Enter into the <u>Load Data Setup</u> page again to check if the change has taken effect. After restoring to factory settings, the default value is the last modified value.
UnbalanceValue (Current unbalance value)	5A	User define: 0A to 6000A, step size 1A Note: The parameter will only take effect when used in three phase. When "UnbalanSet" is enabled, if current unbalance value between any two phases is higher than set value, the load output will be turned off automatically. After restoring to factory settings, the default value is the last modified value.
3 Utility Data Setup		
OverVoltDisconect (Utility over voltage disconnect voltage)	265.0V	User define: (Utility over voltage reconnect voltage plus 10V) to 285.0V, step size: 0.1V
OverVoltReconnect (Utility over voltage reconnect voltage)	255.0V	User define: 220.0V to (Utility over voltage disconnect voltage minus 10V), step size: 0.1V
Low Volt Disconct (Utility low voltage disconnect voltage)	175.0V	User define: 90.0V to (Utility low voltage reconnect voltage minus 10V), step size: 0.1V
LowVolt Reconnect (Utility low voltage reconnect voltage)	185.0V	User define: (Utility low voltage disconnect voltage plus 10V) to 220.0V, step size: 0.1V
OverFreqDisconnect (Utility over frequency disconnect)	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 plus 0.5Hz) to 70.0Hz, step size: 0.1Hz Note: Take the maximum value between 52.0Hz and (Utility under frequency disconnect plus 0.5Hz).

Parameters	Default	User define
UnderFreqDisconct (Utility under frequency disconnect)	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 minus 0.5Hz), step size: 0.1Hz Note: Take the minimum value between 58.0Hz and (Utility over frequency disconnect minus 0.5Hz).
	60.0A	User define: 5.0A to 60.0A for UC3542-0650P20/ UCP3542-0650P20, step size: 0.1A Namely, the maximum current at the battery end when the utility charges the battery.
MaxCharge Current (Max. Utility charging current)	100.0A	User define: 5.0A to 100.0A for UC5542-1050P20/ UCP5542-1050P20, 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 UC3522-1250P20/ UCP3522-1250P20, step size: 0.1A Namely, the maximum current at the battery end when the utility charges the battery.
Grid Enable	DISABLE	User define: DISABLE, ENABLE When set to "ENABLE," the inverter/charger operates in the On-Grid mode (see chapter <u>4.3</u> <u>On-Grid working modes</u> ). The PV supplies power to the load first, and then charges the battery. Only if there is excess energy will it be fed into the Grid. The maximum power fed into the Grid is limited by the setting of the "GridLimit Power." Note: When the "Charging Mode" is set as "Solar" or "UtltyPrior (Utility priority)," this parameter will not take effect.
	2300W	User define: 100W to 3500W for UC3542-0650P20/ UCP3542-0650P20, step size: 100W
GridLimit Power	2300W	User define: 100W to 3500W for UC3522-1250P20/ UCP3522-1250P20, step size: 100W
	3400W	User define: 100W to 5500W for UC5542-1050P20/ UCP5542-1050P20, step size: 100W

Parameters	Default	User define	
4. Battery Data Setup			
BAT Set Mode (Battery set	Creat	User define: Smart (Refer to chapter 2.5.3), Expert	
mode)	Smart	(Refer to chapter 2.5.4)	
		User define: 10.0AH to 1200.0AH, step size: 0.1AH	
PAT Capacity (Patton, capacity)	100.04	Note: When setting the BAT Capacity, press and	
BAT Capacity (Battery capacity)	100.041	hold the "UP/DOWN" button to increase/decrease	
		the value by 100*step size, namely, 10AH.	
EqualizeTime (Battery equalize	100 Міт	User define: 10 minutes to 180 minutes, step size: 1	
charging time)	120 10111	minute	
Boost Time (Battery boost	120 Min	User define: 10 minutes to 180 minutes, step size: 1	
charging time)	120 10111	minute	
T/C mV/ °C /2 (Battery		User define: $0-9$ , step size: 1	
temperature compensate	3	Note: This option is reserved, which is invalid	
coefficient)		currently.	
	56.01/	Under certain working modes, the utility will stop	
	56.0V (48V system)	charging the battery if the battery voltage exceeds	
AuxiliaryOff Volt (Auxiliary		this value.	
module Off voltage)	28.0V (24V system)	User define: (Auxiliary module ON voltage plus	
		$(0.2*N)) \leq Auxiliary module Off voltage \leq Charging$	
		limit voltage (N=Rated battery voltage/12)	
	51.01/	Under certain working modes, the utility will charge	
	(48V system)	the battery if the battery voltage is lower than this	
Auxiliary On Volt (Auxiliary		value.	
module ON voltage)	25.51/	User define: Low voltage disconnect voltage ≤	
	(24V system)	Auxiliary module ON voltage ≤ (Auxiliary module Off	
		voltage minus (0.2*N)) (N=Rated battery voltage/12)	
		User define: 5.0A to 60.0A for UC3542-0650P20/	
MaxCharginCurrent (Battery	60.0A	UCP3542-0650P20, step size: 0.1A. Namely, the	
		maximum allowable charge current on battery side.	
		User define: 5.0A to 100.0A for UC5542-1050P20/	
	100.0A	UCP5542-1050P20, step size: 0.1A. Namely, the	
		maximum allowable charge current on battery side.	
	120.0A	User define: 5.0A to 120.0A for UC3522-1250P20/	
		UCP3522-1250P20, step size: 0.1A. Namely, the	
		maximum allowable charge current on battery side.	

Parameters	Default	User define
	175.0A	User define: 10.0A to 175.0A for UC3542-0650P20/ UCP3542-0650P20, step size: 0.1A. Namely, the maximum allowable discharge current on battery side.
LimitDisChgCurrt (Battery limit discharging current)	250.0A	User define: 10.0A to 250.0A for UC5542-1050P20/ UCP5542-1050P20, step size: 0.1A. Namely, the maximum allowable discharge current on battery side.
	380.0A	User define: 10.0A to 380.0A for UC3522-1250P20/ UCP3522-1250P20, step size: 0.1A. Namely, the maximum allowable discharge current on battery side.
BMS ComStatus (BMS Communication Status)	164	Read-only, "164 indicates abnormal BMS communication, 165 means normal BMS communication"
ChargeControlMode (Battery charge control mode)	VOLT (Voltage)	User define: VOLT, SOC <u>VOLT</u> : The battery voltage control parameters take effect after setting this value as "VOLT." <u>SOC</u> : 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.
BMS InvalidAction	DSP Auto	User define: DSP Auto, NoAction <u>DSP Auto</u> : The inverter/charger works according to the default mode and parameters. <u>NoAction</u> : No charging and discharging, equivalent to standby mode.
Full Discnnct Soc (Full energy disconnect Soc)	100%	It takes effect after the "ChargeControlMode" 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 energy disconnect recover Soc plus 5%) to 100%, or 80% to 100%, step size: 1% Note: Take the maximum value between (Full energy disconnect recover Soc plus 5%) and 80%.

Parameters	Default	User define
FulDiscnctRecvSoc (Full energy disconnect recover Soc)	95%	It takes effect after the "ChargeControlMode" 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 energy disconnect Soc minus 5%), step size: 1%
LwEngyDisRecvrSoc (Low energy disconnect recover Soc)	40%	It cannot be set separately (equals the "LwEgyDnctRecvrSoc"). It takes effect after the "ChargeControlMode" is set as "SOC."
UnderEngyAlarmSoc (Under energy alarm Soc)	25%	It takes effect after the "ChargeControlMode" is set as "SOC." User define: 10% to 35%, or 10% to (Low energy disconnect recover Soc minus 5%), step size: 1% Note: Take the minimum value between (Low energy disconnect recover Soc minus 5%) and 35%.
LwEgyDnctRecvrSoc (Low energy disconnect recover Soc)	40%	It takes effect after the "ChargeControlMode" is set as "SOC." User define: (Under energy alarm Soc plus 5%) to 60%, or 20% to 60%, step size: 1% Note: Take the maximum value between (Under energy alarm Soc plus 5%) and 20%.
LowEngyDiscnctSoc (Low energy disconnect Soc)	10%	It takes effect after the "ChargeControlMode" is set as "SOC." When the battery SOC is lower than this value, the battery will stop discharging. User define: 0 to 10%, step size: 1%
UtiltyChargeOnSoc (Utility charging on Soc)	30%	It takes effect after the "ChargeControlMode" 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%).
UtiltyChargeOfSoc (Utility charging off Soc)	60%	It takes effect after the "ChargeControlMode" 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%.

Parameters	Default	User define
SOC BAT Capacity (SOC battery capacity)	Not fixed, updated in real time	Read-only (After the BMS is connected, this value will read from the BMS)
LimitChgTemp (Limit charge temperature)	0.0℃	User define: -20°C to 0°C, step size: 0.1°C When the environment or the battery temperature is lower than this value, the inverter/charger will stop charging the battery.
LimitDisChgTem (Limit discharge temperature)	0.0℃	User define: -20°C to 0°C, step size: 0.1°C When the environment or the battery temperature is lower than this value, the inverter/charger will stop discharging.
BATOverTemp (Battery over temperature protect)	50.0°C	User define: (Battery over temperature protect recover plus 5°C) to 60°C, step size: 0.1 °C
BATOverTempRecovr (Battery over temperature protect recover)	45.0℃	User define: 30 °C to (Battery over temperature protect minus 5°C), step size: 0.1 °C
Equalize Date	28	User define: $1-28$ , step size: 1
Manual Equalize	OFF	User define: OFF, ON This parameter is for manual equalizing charging. When set to "ON", the inverter/charger enters the manual equalizing charging working mode. After the inverter/charger restarts, the default value is restored to "OFF," indicating that the inverter/charger is charged periodically according to the set equalization charging cycle.
ResetSocCalculate (Reset Soc		Press the ENTER button to reset, the SOC will be
calculate)		automatically recalculated.
ResetSelfStudyAH		Press the ENTER button to reset the self study AH.
5. Basic Param Setup		
BAT Have (Battery have or not)	HAVE	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.

Parameters	Default	User define
Charging Mode	Utlty&solr	User define: Solar, SolarPrior (Solar priority), Utlty&solr (Utility & solar), UtltyPrior (Utility priority). Note: For detailed working modes, refer to chapter 4.
Discharging 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.
LiProtectEnbl (Lithium battery protection enable)	DISABLE	User define: DISABLE, ENABLE Set this value as "ENABLE," the charge/ discharge low temperature limit function is effective.
PV Mode	ALL SINGLE	User define: ALL SINGLE, ALL MULTIPLE, When two PV arrays are independently input, the value shall be set to "ALL SINGLE." When two 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 "ALL MULTIPLE." Product with one PV input is "ALL SINGLE" by default (other PV modes are invalid).
Stand By Mode	Normal	User define: Normal, Standby When set as "Standby," the inverter charger will enter standby mode and the AC output will be stopped. After modifying the parameter and restarting the inverter/charger, the parameter will be restored to the default value (the previous modified value will not be saved).
EqualizeEnable	DISABLE	User define: DISABLE, ENABLE This parameter is for automatic equalizing charging. Set this value as "ENABLE," the inverter/charger performs the equalize charging automatically. After modifying the parameter and restarting the inverter/charger, the parameter will be restored to the default value (the previous modified value will not be saved).

Parameters	Default	User define
	ENABLE	User define: DISABLE, ENABLE
		When set as "ENABLE," the inverter/charger will
		enter the low power consumption mode when certain
		conditions are met, such as no PV and utility, and the
ECO Mode		battery voltage drops to the "Low voltage disconnect
		voltage." After modifying the parameter and
		restarting the inverter/charger, the parameter will be
		restored to the default value (the previous modified
		value will not be saved).
	OFF	User define: OFF, ON
Calibration Mode		Note: This option is reserved, which is invalid
		currently.
	-	Factory Set (After setting the "Stand By Mode" as
		"Standby," some settings can be restored to the
		factory state.) Note: For other parameters, only
Return FactorySet (Return to		the last modified values will be saved and cannot
the factory settings)		be restored to the factory state. Please refer to
		the parameter description for details. After
		setting, restart the inverter/charger for the setting
		to take effect.
FR (fault reset)		Press the "ENTER" button to exit the current fault
		state and resume normal operation.
		Note:The historical fault records will not be
		cleared.
Load Open/Close	OPEN	User define: CLOSE, OPEN.
		Open or close the loads. This parameter and the load
		output switch are of the same control. To change the
		state of either of them, the other will be changed too.
		After modifying the parameter and restarting the
		inverter/charger, the parameter will be restored to the
		default value (the previous modified value will not be
		saved).

Parameters	Default	User define
	DISABLE	User define: DISABLE, ENABLE
		When using a DC power to replace the PV array for
		power supply testing, it is necessary to set the "PV
		DC Input Source" as "ENABLE." Otherwise, the
PVDCInputSource		inverter/charger cannot work properly. After
		modifying the parameter and restarting the
		inverter/charger, the parameter will be restored to the
		default value (the previous modified value will not be
		saved).
ClearAccum Energy (Clear		Press the ENTER button to clear all accumulated
accumulated energy)		charge and discharge energy.
	44.0V (48V system)	User define: 0 to (Dry contact OFF voltage minus
DryContactOnVolt (Dry contact		0.1*N), step size: 0.1V. Note: N=Rated battery
ON voltage)	22.0V (24V system) 50.0V (48V system)	voltage/12.
		When the battery voltage is lower than this value, the
		dry contact is connected.
		User define: (Dry contact ON voltage plus 0.1*N) to
DryContactOfVolt (Dry contact		Over voltage disconnect voltage, step size: 0.1V.
OFF voltage)	25.0	Note: N=Rated battery voltage/12.
	(24V system)	When the battery voltage is higher than this value,
		the dry contact is disconnected.
	Grid	User define: Grid, Generator
		When the AC input is a generator, this parameter
		needs to be set to "Generator" to improve the
AC Input mode		charging capability.
		Note: If the AC input mode does not match the
		AU source of the actual input, the normal
		After potting restort the inverter/charger will be affected.
		After setting, restart the inverter/charger for 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.

Parameters	Default	User define
BATT Input Mode	Shared	User define: Shared, Independent 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 "Shared" mode. If each inverter/charger is connected to a separate battery pack, this value needs to be set to "Independent" mode.
Low Power Enable	DISABLE	User define: DISABLE, ENABLE When set to "ENABLE," the inverter/charger will enter the low power mode if the AC output power continuously remains below 50W during the "LowPowerCheckTime." Low power mode wake-up method: After the inverter/charger enters the low power 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 "LowPowerCheckTime." 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 low power mode.
LowPowerCheckTime	10 Min	User define: 1minute to 10 minutes, step size: 1 minute
6. Svs Param Setup		
BackLightTime	30S	User define: 6S, 30S, 60S, Always
BuzzerAlert	ON	User define: OFF, ON If set to "ON," the buzzer will sound when an error occurs and will keep silence when the error is cleared. If set to "OFF," the buzzer will not sound even if an error occurs.
BckLightOnOff (Back Light On/Off)	ON	User define: OFF, ON Note: "BckLightOnOff" is superior to "BackLightTime."
BaudRate	115200	User define: 115200, 9600, 19200, 38400, 57600
Address	1	User define: 1—254, step size: 1

Parameters	Default	User define			
Log Data Interval	60 Sec	User define: 1 second to 3600 seconds, step size: 1 second (Note: When setting this value, press and hold the "UP/DOWN" button to increase/decrease the value by 100*step size, namely, 100 seconds.) Set the time interval of 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.)			
Language	ENGLISH	User define: ENGLISH, CHINESE			
BlueValid	VALID	User define: INVALID, VALID Note: This option is reserved, which is invalid currently.			
Temperature Unit	°C	User define: °C, °F			
BMS Valid/Invalid	INVALID	User define: INVALID, VALID Set this value as "VALID," the inverter/charger will communicate with the battery normally.			
BMS Protocol	0	User define: $0-240$ , step size: 1 Note: Refer to the Lithium battery protocol file.			
BMS Com Method	RS485	Read-only			
Led Switch	OPEN	User define: OPEN, CLOSE Turn on/off the PV/LOAD/GRID/RUN indicators.			
BMSVItCntrlEnable (BMS voltage control enable)	DISABLE	User define: DISABLE, ENABLE Set this value as "ENABLE," the BMS internal control parameters will be automatically synchronized to the inverter/charger, and the inverter/charger will control the battery charging/discharging based on these parameters.			
BMSCurent Select (BMS current control select) (See chapter <u>2.5.2 Battery work</u> <u>modes</u> for details)	INVALID	User define: INVALID, BMS, VIRTUAL_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. Set this value as "VIRTUAL_BMS", the inverter/charger controls the charge and discharge according to the charge-discharge current value calculated by the MAP table, which is preset in the inverter/charger.			
Parameters	Default	User define			
------------------------------------------------------------------	---------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	--	--
Log Data Reset	-	Press the ENTER button to clear the voltage, current and other data stored regularly, excluding the historical faults. Note: After pressing the ENTER button, the flashing LED light will become steady or turn off, and then the inverter/charger will restart, indicating that the reset is complete.			
BATT Dischage Kx (Batery charge and discharge coefficient)	3C	User define: 1C, 3C This value can be obtained by viewing the battery label. It takes effect only when the "BMSCurent Select" is set as "VIRTUAL_BMS." When this parameter is set to "3C," the inverter/charger controls the charge and discharge according to the minimum value between 3 x BAT Capacity and MaxCharginCurrent/ LimitDisChgCurrt (which are set on the LCD).			
MAP TEMP Select (MAP temperature select)	Default	User define: Default (25 °C ), BMS_ET (BMS environment temperature), BMS_C_MaxT (BMS cell maximum temperature), BMS_C_MinT (BMS cell minimum temperature), RS485, DSP The MAP table calculates the charging and discharging current values based on the temperature and SOC value of the lithium battery. When the lithium battery has BMS function and supports temperature upload, set "MAP TEMP Select" as "BMS_ET, BMS_C_MaxT, or BMS_C_MinT" according to the uploaded temperature. The "BMS_ET, BMS_C_MaxT, and BMS_C_MinT" take effect only when the "BMSCurent Select" is set as "VIRTUAL_BMS." When the lithium battery only has a protection board, set "MAP TEMP Select" as "RS485" (A smart remote temperature sensor is needed). Otherwise; select "default (25°C)."			

Parameters	Default	User define
		User define: ENABLE, DISABLE
	ENABLE	Under the normal BMS communication, if the
ManualChageEnable (Manual		"ManualChageEnable" is set to "ENABLE," the
charge enable)		lithium battery charging is allowed. If the
		"ManualChageEnable" is set to "DISABLE," the
		lithium battery charging is not allowed.

### 7. Sys DataTime Setup (See chapter 2.5.5)

### 8. Password Setup (See chapter 2.5.6)

9. Bat Control Data Setup (This	will take effect	when setting the	"BAT Set Mode"	as "Smart.")

BAT Set Mode (Battery set mode)	Smart	Read-only
Level	48V (48V system) 24V (24V system)	Read-only
Battery Type	AGM	48V battery type: AGM, OPZS, GEL, FLD, LFP15S, LFP16S, LNCM13S, LNCM14S
5 51		24V battery type: AGM, OPZS, GEL, FLD, LFP8S, LNCM6S, LNCM7S
BoostCharginVolt (Boost charging voltage)	57.6V (48V system) 28.8V (24V system)	
FloatChagingVolt (Float	55.2V (48V system) 27.6V	Deed eek
LowVoltReconect (Low voltage reconnect voltage)	(24V system) 50.0V (48V system) 25.0V (24V system)	Note: They are determined by the battery type and cannot be modified.
LowVoltDisconect (Low voltage disconnect voltage)	43.2V (48V system) 21.6V (24V system)	
9. Bat Control Data Setup (This	will take effect	when setting the "BAT Set Mode" as "Expert" first)
BAT Set Mode (Battery set mode)	Expert	Read-only
Level	48V (48V system) 24V (24V system)	Read-only

Parameters	Default	User define			
		48V battery type: AGM, OPZS, GEL, FLD, LFP15S,			
Battery Type	AGM	LFP16S, LNCM13S, LNCM14S			
		24V battery type: AGM, OPZS, GEL, FLD, LFP8S,			
		LNCM6S, LNCM7S			
OverVoltDiscnect (Over voltage	64.0V (48V system)	User define: Charging limit voltage< Over voltage			
disconnect voltage)	32.0V (24V system)	disconnect voltage≤ 16*N, step size: 0.1V Note: N=Rated battery voltage/12.			
ChargingLimitVolt (Charging	60.0V (48V system)	User define: Equalize charging voltage< Charging			
limit voltage)	30.0V (24V system)	limit voltage< Over voltage disconnect voltage, step size: 0.1V			
Over\/oltReconect (Over	60.0V (48V system)	User define: 9*N≤ Over voltage reconnect voltage<			
voltage reconnect voltage)	30.0V	(Over voltage disconnect voltage minus 0.1*N), step			
	(24V system)	size: 0.1V. Note: N=Rated battery voltage/12.			
EqualizeChagVolt (Equalize	(48V system)	User define: Boost charging voltage≤ Equalize			
charging voltage)	29.2V (24V system)	charging voltage≤ Charging limit voltage, step size: 0.1V			
BoostCharginVolt (Boost	57.6V (48V system)	User define: Float charging voltage< Boost charging			
charging voltage)	28.8V (24V system)	voltage≤ Equalize charging voltage, step size: 0.1V			
FloatChagingVolt (Float	55.2V (48V system)	User define: Boost voltage reconnect voltage< Float			
charging voltage)	27.6V (24V system)	charging voltage≤ Boost charging voltage, step size: 0.1V			
BoostRecnectVolt (Boost	52.8V (48V system)	User define: Low voltage reconnect voltage< Boost			
voltage reconnect voltage)	26.4V	voltage reconnect voltage< Float charging voltage,			
	(240 393(611))				
		voltage reconnect voltage< Boost voltage reconnect			
	50.0V (48V system)	voltage step size: 0.1V			
		Note: This voltage is also the recovery voltage			
LowVoltReconect (Low voltage		for the AC output main power-off and second			
reconnect voltage)		power-off. The relays of the AC output main			
	25.0V	power-off and second power-off are connected			
	(24V system)	again after the battery voltage rises to this			
		voltage.			
Linda) (H) Marris Dalar m	48.8V	User define: (Under voltage warning voltage plus			
	(48V system)	0.1*N)< Under voltage warning recover voltage≤ Low			
voltage warning recover	24.4V	voltage reconnect voltage, step size: 0.1V			
voltage)	(24V system)	Note: N=Rated battery voltage/12.			

Parameters	Default	User define			
		User define: Discharging limit voltage≤ Under voltage			
	48.0V	warning voltage< (Under voltage warning recover			
	(48V system)	voltage minus 0.1*N), step size: 0.1V Note: N=Rated			
UnderVolt Warn (Under voltage		battery voltage/12.			
warning voltage)		Note: This voltage is also the disconnect voltage			
	24.0V (24V system)	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.			
		User define: Discharging limit voltage≤ Low voltage			
	43.2V (48V system)	disconnect voltage< Low voltage reconnect voltage,			
	, ,	step size: 0.1V			
LowVoltDisconect (Low voltage		Note: This voltage is also the disconnect voltage			
disconnect voltage)	21.6V	for the AC output second power-off. The relay of			
	(24V system)	the AC output second power-off is disconnected			
		after the battery voltage drops to this voltage.			
Dischrael imit/olt (Discharging	40.7V				
	20.3V	Read-only			
	(24V system)				

Note: Except for some parameters (such as "OutputFrequency, Phase Set, Return FactorySet, and AC Input mode" etc.), the inverter/charger needs to be restarted to take effect. The rest of the parameters take effect immediately after modifying.

### 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	<ol> <li>Lithium battery pack with BMS and current control function at the end of charge and discharge</li> <li>Normal communication</li> </ol>	The inverter/charger controls charging and discharging based on the read BMS values.	See Figure 2 "Setting process for lithium battery pack with BMS and current control function"

3	<ol> <li>Lithium battery pack with</li></ol>	The inverter/charger controls	See Figure 3 "Setting
	BMS, without current	charging and discharging	process for lithium battery
	control function at the end	based on the pre-set MAP	pack with BMS, without
	of charge and discharge <li>Normal communication</li>	table.	current control function"
4	<ol> <li>Lithium battery pack with protective board only (no BMS)</li> <li>No communication (A smart remote temperature sensor is recommended in this scenario.)</li> </ol>	The inverter/charger controls charging and discharging based on the pre-set MAP table.	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. Set "BAT Capacity, T/C mV/°C/2, Battery Type" correctly, and set "ChargeControlMode" as "VOLT" or "SOC." And then set the battery voltage control parameters or SOC control parameters. The inverter/charger will control charging and discharging based on the LCD settings.



#### 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. Set BMS protocol correctly, set "BMS Valid/Invalid" as "VALID," set "BMSVItCntrlEnable" as "ENABLE," set "BMSCurent Select" as "BMS," and set "ChargeControlMode" as "VOLT" or "SOC." And then set the battery voltage control parameters or SOC

control parameters. The inverter/charger controls charging and discharging based on the read BMS

values.



Тір	Please go to EPEVER official website to download the currently supported BMS manufacturers and the BMS parameters.
	<ul> <li>The inverter/charger will control charging and discharging based on the LCD settings after setting the "BMSCurent Select" as "INVALID," or the communication between battery and inverter/charger fails.</li> <li>The inverter/charger controls charging and discharging based on the pre-set MAP table after setting the "BMSCurent Select" as "VIRTUAL_BMS."</li> </ul>

	٠	Due	to	the	different	charging	and	discharging	characteristics	and	voltage
		cons	ister	ncy d	of lithium	batteries f	rom o	lifferent man	ufacturers, it is	neces	sary for
		profe	ssic	onals	to guide	the use of V	VIRTU	JAL_BMS for	charging and di	schar	ging.

## 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. Set BMS protocol and "BATT Dischage Kx" (viewing the battery label) correctly, set "BMS Valid/Invalid" as "VALID," set "BMSVItChtrlEnable" as "ENABLE," set "BMSCurent Select" as "VIRTUAL\_BMS," set "MAP TEMP Select" as "BMS\_ET," set "Battery Type" correctly, and set "ChargeControlMode" as "VOLT" or "SOC." And then set the battery voltage control parameters or SOC control parameters. The inverter/charger controls charging and discharging based on the pre-set MAP table.



#### 

- The inverter/charger will control charging and discharging based on the LCD settings after setting the "BMSCurent Select" as "INVALID."
   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 VIRTUAL BMS for charging and discharging.
  - The MAP table controlling the battery charge and discharge is only related to parameters of "BMSCurent Select, BATT Dischage Kx, Battery Type, and MAP TEMP Select."

#### • 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. Set "BATT Dischage Kx" (viewing the battery label) correctly, set "BMSCurent Select" as "VIRTUAL\_BMS," set "MAP TEMP Select" as "RS485" (A smart remote temperature sensor is needed. Otherwise; select "default (25°C)."), set "Battery Type" correctly, and set "ChargeControlMode" as "VOLT" or "SOC." And then set the battery voltage control parameters or SOC control parameters. The inverter/charger controls charging and discharging based on the pre-set MAP table.



### 2.5.3 Battery voltage control parameters (Smart)

After setting the "BAT Set Mode" as "Smart," the battery voltage control parameters are determined by the battery type and cannot be modified. To modify them, set the "BAT Set Mode" as "Expert" first.

### 2.5.4 Battery voltage control parameters (Expert)

After setting the "BAT Set Mode" as "Expert," all battery voltage control parameters can be modified.

#### 1) Lead-acid battery voltage control parameters

Battery Type	AGM	OPZS	GEL	FLD	User define
Voltage control parameters		0. 20			
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	25.0V	25.0V	25.0V	25.0V	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	21.6V	21.6V	21.6V	21.6V	20.4-32V
Discharging Limit Voltage	20.3V	20.3V	20.3V	20.3V	Read-only

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

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 UC3522-1250P20/UCP3522-1250P20 as below:



Battery Type	AGM	OPZS	GEL	FLD	User define
Voltage control parameters		0.10			
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	50.0V	50.0V	50.0V	50.0V	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	43.2V	43.2V	43.2V	43.2V	40.8-64V
Discharging Limit Voltage	40.7V	40.7V	40.7V	40.7V	Read-only

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

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 UC5542-1050P20/UCP5542-1050P20 /UC3542-0650P20/UCP3542-0650P20 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 parameters

Dettern Turn			LFP		
Battery Type	24V system		48V system		
Voltage control parameters	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	Read-only	41.2V	44.0V	Read-only

Battery Type	LNCM		
		24V system	
Voltage control parameters	LNCM6S	LNCM7S	User Define
Over Voltage Disconnect Voltage	25.8V	30.1V	21.5-32V
Charging Limit Voltage	25.5V	29.7V	21.5-32V
Over Voltage Reconnect Voltage	25.5V	29.7V	21.5-32V
Equalize Charging Voltage	24.8V	28.9V	21.5-32V
Boost Charging Voltage	24.8V	28.9V	21.5-32V
Float Charging Voltage	24.0V	28.0V	21.5-32V
Boost Voltage Reconnect Voltage	23.5V	27.5V	21.5-32V
Low Voltage Reconnect Voltage	22.2V	25.9V	21.5-32V
Under Voltage Warning Recover Voltage	21.6V	25.2V	21.5-32V
Under Voltage Warning Voltage	21.0V	24.5V	21.5-32V

Low Voltage Disconnect Voltage	21.5V	22.4V	21.5-32V
Discharging Limit Voltage	18.6V	21.7V	Read-only

Battery Type	LNCM			
		48V system		
Voltage control parameters	LNCM13S	LNCM14S	User Define	
Over Voltage Disconnect Voltage	55.9V	60.2V	42.8-64V	
Charging Limit Voltage	55.2V	59.5V	42.8-64V	
Over Voltage Reconnect Voltage	55.2V	59.5V	42.8-64V	
Equalize Charging Voltage	53.8V	57.9V	42.8-64V	
Boost Charging Voltage	53.8V	57.9V	42.8-64V	
Float Charging Voltage	52.0V	56.0V	42.8-64V	
Boost Voltage Reconnect Voltage	51.0V	55.0V	42.8-64V	
Low Voltage Reconnect Voltage	48.1V	51.8V	42.8-64V	
Under Voltage Warning Recover Voltage	46.8V	50.4V	42.8-64V	
Under Voltage Warning Voltage	45.5V	49.0V	42.8-64V	
Low Voltage Disconnect Voltage	42.8V	44.8V	42.8-64V	
Discharging Limit Voltage	40.3V	43.4V	Read-only	

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

	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
CAUTION	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.

### 2.5.5 Time setting

Se	Set Data Navigation			
1.	PV	Data Setup		
2.	Load	Data Setup		
3.	Utility	Data Setup		
4.	Battery	Data Setup		
5.	Basic	Param Setup		
6.	Sys	Param Setup		
7.	Sys	DataTime Setup		
8.	PassWord	Setun		

Enter the "Set Data Navigation" interface according to chapter <u>2.4.3</u> <u>Administrator interface</u>. Then click the "UP/DOWN" button to select "7 Sys Data Time Setup", and click the "ENTER" button to enter the system time setting interface. On the system time setting interface, click the "ENTER" button to move right, click the "AC OUT" button to move left, and click the "UP/DOWN" button to adjust the value. After the time setting is completed, move the cursor back to the first digit and click the "ENTER" to confirm. The system time will be updated if the setting value complies with the range.

### 2.5.6 Password modifying

Set Data Navigation				
1.	PV	Data Setup		
2.	Load	Data Setup		
3.	Utility	Data Setup		
4.	Battery	Data Setup		
5.	Basic	Param Setup		
6.	Sys	Param Setup		
7.	Sys	DataTime Setup		
8.	PassWord	Setup		

Enter the "Set Data Navigation" interface according to chapter <u>2.4.3</u> <u>Administrator interface</u>. Then click the "UP/DOWN" button to select "8 PassWord Setup", and click the "ENTER" button to enter the password modifying interface. Click the "ENTER" button to move right, click the "AC OUT" button to move left, and click the "UP/DOWN" button to adjust the value. After the password is modified, move the cursor back to the first digit and click the "ENTER" button to confirm.

Note: The default password is "0000", which is set to prevent non-professional operations. Please memorize the new password after modifying it. If forgetting the password, press and hold the "AC OUT" button on the password inputting page; the password will be automatically reset to "0000."

# **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<sup>2</sup>.
- 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 inverter/charger has no anti-reverse protection circuit at the DC input terminal, it is prohibited to
  reverse connect the battery. Otherwise, it may cause damage to the inverter/charger.
- The inverter/charger has anti-reverse protection circuit at the PV input terminal.



1. The short-circuit current of the PV array must comply with the "PV Maximum Short-circuit Current" in chapter <u>8 Specifications</u>. 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 lsc (Max. short circuit current). Please refer to the lsc value in the PV module's specifications. When the PV modules are connected in series, the total lsc equals any PV module's lsc. When the PV modules are connected in parallel, the total lsc equals the sum of the PV module's lsc. The PV array's lsc 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	
UC3522-1250P20		2P—20A (with arc extinguishing function)	
UC3542-0650P20	4mm <sup>2</sup> /11AWG		
UCP3522-1250P20			
UCP3542-0650P20	6mm <sup>2</sup> /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
UC5542-1050P20	4mm <sup>2</sup> /11AWG	2P—20A (with arc extinguishing function)
UCP5542-1050P20	6mm <sup>2</sup> /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
UC5542-1050P20	10mm <sup>2</sup> /7AWG	2P—50A (with arc extinguishing function)
UCP5542-1050P20	13mm <sup>2</sup> /6AWG	2P—50A (with arc extinguishing function)



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°C).
--------------------

### > Recommended Utility wire size

Model	Utility wire size	Circuit breaker	
UC3522-1250P20			
UC3542-0650P20	2/// 2////0	2P—32A	
UCP3522-1250P20	6mm <sup>2</sup> /10AWG		
UCP3542-0650P20			
UC5542-1050P20	2/74/4/0	00 504	
UCP5542-1050P20	10mm <sup>2</sup> /7AWG	2P—50A	



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
UC3522-1250P20		
UC5542-1050P20	252/20100	20.0004
UCP3522-1250P20	250P20 35 mm²/2AWG 050P20	2P—200A
UCP5542-1050P20		
UC3542-0650P20	20 2/10/20	00 4054
UCP3542-0650P20	20mm <sup>2</sup> /4AVVG	2P—125A



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
UC3522-1250P20		
UC3542-0650P20	C3542-0650P20	
UCP3522-1250P20	6mm²/10AWG	2F
UCP3542-0650P20		
UC5542-1050P20	10	
UCP5542-1050P20	Tomm-//AvvG	2P—50A

	• The wire size is only for reference. Suppose a long distance exists between the PV
$\wedge$	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.
CAUTION	• 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.
	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 a sleeve.



### 3.4 Wiring the inverter/charger

Connect the inverter/charger in the order of " $\bigcirc$  Ground > 2 Battery  $\implies$  > 3 Load  $\heartsuit$  >  $\bigcirc$  PV  $\boxplus$  > 5 Utility  $\bowtie$  or Generator > 6 Optional accessories", and disconnect the inverter/charger in the reverse order. The following wiring sequence is illustrated in the appearance of "UC3522-1250P20/UC9542-0650P20." 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.



	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.
M	The cabinet of the inverter/charger is connected to earth through the earth
Grounding	rail, along with the AC input and output's PE (Protective Earth) terminal.



### 2. Connect the battery

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



### 3. Connect the AC load

	· 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
4	inverter/charger. The AC load's surge power must be lower than the instantaneous
WARNING	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 "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 "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 "Low Voltage Disconnect Voltage," there is no output at the AC output second load interface. Once the battery voltage rises above the "Low Voltage Reconnect Voltage," restoring the output of the AC output second load interface.
- ③ When the battery voltage is between "Under Voltage Warning Voltage" and "Low Voltage Reconnect Voltage" 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.
- If the "Under Voltage Warning Voltage" is set higher than the "Low Voltage Reconnect Voltage," the AC output main power-off relay will be forcibly disconnected after a 5-second delay. Once the "Under Voltage Warning Voltage" and "Low Voltage Reconnect Voltage" 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.

If there is no output at the AC output main load interface, please follow the steps below to troubleshoot:
 Check whether the battery voltage is lower than the "Under Voltage Warning Voltage" during no-load output. If the battery voltage is lower than the "Under Voltage Warning Voltage," please charge the battery. When the battery voltage is higher than the "Low Voltage Reconnect Voltage," restoring the output of the AC output main load interface.
 If the battery voltage is higher than the "Under Voltage Warning Voltage" 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 "Under Voltage Warning Voltage" and the "Low Voltage Reconnect Voltage" appropriately, until the load output is normal.

### • AC OUTPUT (MAIN) connection



AC OUTPUT (SECOND) connection



### 4. Connect the PV modules

WARNING	<ul> <li>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.</li> <li>It is forbidden to connect the positive and negative poles of the PV with the ground;</li> </ul>
	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



 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.

<ul> <li>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).</li> </ul>
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 *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 *Dry Contact ON Voltage* and *the Dry Contact OFF Voltage* are different. Please refer to the chapter <u>2.5.1 Parameters list</u> for details.

### 6. Connect optional accessories

### Connect the communication module

Connect the WiFi, Bluetooth, TCP, or 4G 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 the cloud APP, WiFi, Bluetooth, TCP, or 4G module user manual.





# 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.



	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
4	any responsibility for not following the operation.
WARNING	• 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.



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 chapter <u>2.4 Interface</u>.



# 4 Working modes

# 4.1 Abbreviation

Abbreviation	Instruction
P <sub>PV</sub>	PV power
PLOAD	Load power
VBAT	Battery voltage
LVD	Low Voltage Disconnect Voltage
LVR	Low Voltage Reconnect Voltage
LED	Low Energy Disconnect SOC
LER	Low Energy Disconnect Recover SOC
AOF	Auxiliary module OFF voltage (namely, Utility charging OFF voltage)
AON	Auxiliary module ON voltage (namely, Utility charging ON voltage)
UCF	Utility Charging OFF SOC
UCO	Utility Charging ON SOC
MCC	Battery Max. Charging Current
	The battery charging state, which indicates the ratio of the current storage
SOC	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.



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





Scenario C: Both PV and Utility are available.











Charging Mode: "Solar prior" 2023-03-28 16:49 AGM Boos Status OK P<sub>PV</sub> ≤ MCC\*V<sub>BAT</sub> PPV > MCC' 2023-03-28 16:51 AGM (C-4) ΡV V<sub>BAT</sub>≥AOF V<sub>BAT</sub> ≤ AON Utility 🔽 / SOC ≥ UCF SOC ≤ UCO 2023-03-28 16:53 AGM 219.2 V Status: Err 50

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

When the PV power is greater than the (MCC\*V<sub>BAT</sub>), the Utility and PV supply power to the load, and the PV charges the battery at the same time.

When the PV power is lower than or equal to the (MCC\*V<sub>BAT</sub>), the Utility supplies power to the load and the PV charges the battery.

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 **AON** value.
- The battery SOC is lower than or equal to the **UCO** value.

Note: When the battery voltage is greater than or equal to the **AOF** value, or the battery SOC is greater than or equal to the **UCF** value, the working mode returns to state **2**.




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

	Charging Mode: "Solar"	Discharging Mode: " <u>PV&gt;BT&gt;BP</u> "
(D-1) PV 🔀	2023-03-28 17:40 AGM 2023-03-28 17:40 AGM	<ul> <li>Any of the following is satisfied, the battery supplies the load.</li> <li>The battery voltage is greater than or equal to the LVR value.</li> <li>The battery SOC is greater than or equal to the LER value.</li> </ul>
Utility 💌	2023-03-28 17:41 AGM → → → → → → → → → → → → → → → → → → →	<ul> <li>Any of the following is satisfied, the Utility supplies power to the load.</li> <li>The battery voltage is lower than or equal to the LVD value.</li> <li>The battery SOC is lower than or equal to the LED value.</li> </ul>



	Charging Mode: "Solar prior"	Discharging Mode: " <u>PV&gt;BT&gt;BP</u> "
(D-3)	Z023-03-28 17:31 AGM	<ul> <li>Any of the following is satisfied, the battery supplies the load.</li> <li>The battery voltage is higher than or equal to the AOF value.</li> <li>The battery SOC is greater than or equal to the UCF value.</li> </ul>
Utility 🗹	2023-03-28 17:30 AGM Boost	<ul> <li>Any of the following is satisfied, the Utility supplies power to the load and charges the battery simultaneously.</li> <li>The battery voltage is lower than or equal to the AON value.</li> <li>The battery SOC is lower than or equal to the UCO value.</li> </ul>

	Charging Mode: " <u>Solar prior</u> '	Discharging Mode: " <u>PV&gt;BP&gt;BT</u> " or " <u>BP&gt;PV&gt;BT</u> "
(D-4) PV X Utility √	$\begin{array}{c} \hline \\ \hline $	<ul> <li>Any of the following is satisfied, the Utility supplies power to the load.</li> <li>The battery voltage is greater than or equal to the AOF value.</li> <li>The battery SOC is greater than or equal to the UCF value.</li> </ul>



	Charging Mode: "Utly & solr"	Discharging Mode: No impact under any
	or " <u>Utityprior</u> "	mode
(D-5)	2023-03-28 17:15 AGM Boost	
PV 🔀 Utility 🗹		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.





## 4.3 On-Grid working modes

#### 4.3.1 On-Grid operation procedure

Set the "Grid Enable" as "ENABLE" and set "GridLimit Power" as required on the LCD. Detailed procedure as below:



#### 4.3.2 Battery mode

	Charging Mode: " <u>Solar prior</u> "	Discharging Mode: " <u>BP&gt;PV&gt;BT</u> "
	2023-12-27 09:19 * AGM Boost	Set the "Grid Enable" and "GridLimit
(On-Grid	<sup>*</sup> <sup>276.7</sup> ∨ − <sup>57.5</sup> ∨ <sup>+</sup>	Power" as above procedure. When the PV
Scenario 1)		input power is greater than the sum of the
	240.6 V 1059 W BuRase	charging power and the load power, the PV
PV 🗹	Status: OK	charges the battery first, and then supplies
Utility 🗹		power to the load. Only if there is excess
· · · · · <b>,</b> <u> </u>		energy will it be fed into the Grid. The power
		fed into the Grid cannot exceed the setting of
		"GridLimit Power."



Note: When the charging mode is set to "<u>Solar prior</u>", the inverter/charger can enter the On-Grid working mode only under the discharging mode of "BP > PV > BT;" other discharging modes cannot achieve the

On-Grid.

	Charging Mode: " <u>Utly &amp;</u> solr"	Discharging Mode: No impact under any mode
(On-Grid Scenario 2) PV ☑ Utility ☑	2023-12-29 14-28 * AGM Boost	Set the "Grid Enable" and "GridLimit Power" as above procedure. When the PV input power is greater than the sum of the charging power and the load power, the PV supplies power to the load first, and then charges the battery. Only if there is excess energy will it be fed into the Grid. The power fed into the Grid cannot exceed the setting of "GridLimit Power."



#### 4.3.3 No battery mode



●Set the "Grid Enable" and "GridLimit Power" as above procedure. When the PV input power is greater than the load power, the PV supplies power to the load first. Only if there is excess energy will it be fed into the Grid. The power fed into the Grid cannot exceed the setting of "GridLimit Power."

Note: If there is no load power, all the PV input power will be fed into the Grid. The power fed into the Grid cannot exceed the setting of "GridLimit Power."

When the PV input power is lower than or equal to the load power, the PV and the Utility supply power to the load together.

Note: The On-Grid working mode must be carried out with PV input and Grid input, which is limited by the setting of "Grid Enable" and "GridLimit Current."

# Protections

No.	Protections	Instruction
		When the PV array's actual charging current/power exceeds its rated current/power, it will charge the battery as
1	D) / limit Current/Dewer	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.
		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 <u>8 Specifications)</u> , and the reverse connection time should not exceed 5
	DV Deverse Delerity	minutes. Frequent incorrect wiring is strictly prohibited as it may damage the inverter/charger.
3	PV Reverse Polarity	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.
		When the utility voltage exceeds the set value of "Utility over voltage disconnect voltage", the utility will stop
4	Utility input over-voltage	charging and supplying the load.
_	l Itility input under voltage	When the utility voltage is lower than the set value of "Utility low voltage disconnect voltage", the utility will stop
5	ounty input under-voltage	charging and supplying the load.
	Potton, over veltage	When the battery voltage goes higher than the [Over Voltage Disconnect Voltage], the PV/Utility will stop
0	Dattery over-voltage	charging the battery to protect the battery from being over-charged.

No.	Protections	Instruction						
-	Dettem even dischange	When the battery voltage goes lower than the [Low Voltage Disconnect Voltage], the battery will stop						
1	Battery over-discharge	y over-discharge discharging to protect the battery from being over-discharged.						
		The output is turned off ir	mmediately in the occurrence	e of short-circuiting. And the	en, the output is recovered			
		automatically after a delay	time of 5s, 10s, and 15s sep	arately (less than three times	s recovery within 5 minutes,			
		it will be recounted). The in	nverter/charger stops working	g after the 4th protection and	d can resume working after			
	Lood output abort airquit	resetting or restarting.						
ð	Load output short circuit	Clear the fault in time beca	use it may damage the invert	ter/charger permanently.				
		Note: Resetting operation	See chapter 2.4.3 Admini	<u>strator interface</u> to enter th	e "5. Basic Param Setup"			
		screen, and then click the l	JP/DOWN button to locate th	e "FR (fault reset)" menu. Cli	ck the ENTER button to exit			
		the current fault state and r	resume normal operation.					
		When the internal temperature overheats, the inverter/charger will stop charging/discharging.						
9	Device overheating	The inverter/charger will resume charging/discharging when the internal temperature is normal and the						
		protection time lasts more than 20 minutes.						
	UC3522-1250P20	3605W≤P<4550W	4550W≤P<5250W	5250W≤P<7000W	P≥7000W			
	UC3542-0650P20	Protect after 30 seconds	Protect after 10 seconds	Protect after 5 seconds	Protect immediately			
10	UCP3522-1250P20				I Totect infinediately			
	UCP3542-0650P20	Note: The output is rec	overed automatically after	a delay time of 5s 10s	and 15s separately. The			
	Inverter overload	inverter/charger stops work	king after the 4th protection a	nd can resume working after	resetting or restarting			
(no Utility) (no Utility)					resetting of restarting.			
	UC3522-1250P20	3850W≤P<4795W	4795W≤P<5495W	5495W≤P<7000W	P≥7000W			
	UC3542-0650P20	Protect after 30 seconds	Protect after 10 seconds	Protect after 5 seconds	Protect immediately			
11	UCP3522-1250P20							
	UCP3542-0650P20	Note: The output is rec	overed automatically after	a delay time of 5s 10s	and 15s separately. The			
	Utility bypass overload	inverter/charger stops work	king after the 4th protection a	nd can resume working after	resetting or restarting			
	(no-Battery mode)							

No.	Protections	Instruction					
	UC3522-1250P20	5350W≤P<6295W	- 5350W≤P<6295W 6295W≤P<6995W		6995W≤P<8500W		P≥8500W
	UC3542-0650P20 UCP3522-1250P20	Protect after 30 seconds	Protect	after 10 seconds	Protect after 5 s	econds	Protect immediately
12	UCP3542-0650P20 Utility bypass overload (Battery mode)	Note: The output is reco inverter/charger stops work	overed a	utomatically after the 4th protection a	a delay time of nd can resume wor	5s, 10s, king after	and 15s separately. The resetting or restarting.
	UC5542-1050P20	5665W≤P<6600W		6600W≤F	P<7700W		P≥7700W
13	UCP5542-1050P20	Protect after 30 seconds Protect after 10 seconds					Protect immediately
	Inverter overload (no Utility)	Note: The output is reco inverter/charger stops work	overed a	utomatically after the 4th protection a	a delay time of nd can resume wor	5s, 10s, king after	and 15s separately. The resetting or restarting.
	UC5542-1050P20	6050W≤P<6985W		6985W≤F	P<8085W		P≥8085W
14	UCP5542-1050P20	Protect after 30 seconds Protect after 10 se		10 seconds		Protect immediately	
	Utility bypass overload (no-Battery mode)	Note: The output is reco inverter/charger stops work	overed a	utomatically after the 4th protection a	a delay time of nd can resume wor	5s, 10s, king after	and 15s separately. The resetting or restarting.
	UC5542-1050P20	8550W≤P<9485W		9485W≤P	<10585W		P≥10585W
15	UCP5542-1050P20	Protect after 30 second	ds	Protect after	10 seconds		Protect immediately
	Utility bypass overload (Battery mode)	Note: The output is reco inverter/charger stops worki	overed a	utomatically after the 4th protection a	a delay time of nd can resume wor	5s, 10s, king after	and 15s separately. The resetting or restarting.

# 6 Troubleshooting

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 <sup>①</sup>	Indicator	Buzzer	Solution
1	BAT OVP (Battery over voltage protection)	Err4			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 "over voltage disconnect voltage" is inconsistent with the battery specifications. After the battery voltage drops below the set value of "over voltage reconnect voltage", the alarm will automatically be cleared.
2	BAT UVP (Battery under voltage protection)	Err5			Disconnect the loads connection, and check whether the battery voltage is too low. After the battery voltage is charged and restored to above the "low voltage reconnect voltage", it will automatically return to normal, or use other methods to charge the battery.
3	BAT OTP (Battery over temperature protection)	Err11			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 "Battery Max. charging current " and "Battery limit discharging current." It resumes normal work when the battery cools down to below the "Battery over temperature protect recover."

No.	Fault/Status	Error code <sup>①</sup>	Indicator	Buzzer	Solution
4	BAT OCP (Battery over current protection)	Err37			Check that the battery actual charging and discharging current does not exceed the setting values of "Battery Max. charging current " and "Battery limit discharging current."
5	BAT DROP (Battery dropout)	Err39			Check whether the battery connection is normal, and whether the BMS protection occurs.
6	BAT UNDERVOLT WARN (Battery under voltage warning)	Err50			Check if the battery voltage is lower than the "under voltage warning voltage"
7	BAT FTA (Battery fail to activate)	Err56			Check if the battery connection is normal and the BMS communication of the lithium battery is normal.

①The fault/status code is displayed in the "Status" column at the bottom right corner of the LCD. When multiple faults occur simultaneously, the LCD only displays the fault code with the smallest value.

### 6.2 PV faults

No.	Fault/Status	Error code <sup>①</sup>	Indicator	Buzzer <sup>②</sup>	Solution
1	PV1 OVP (PV1 over voltage protection)	Err15	PV indicator red on	Intermitte nt beeps	Check if the PV open-circuit voltage is too high (greater than 500 V). The alarm is released when the PV open-circuit voltage is below 480 V.
2	PV1 OCP (PV1 over current protection)	Err17	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.

No.	Fault/Status	Error code <sup>①</sup>	Indicator	Buzzer®	Solution
3	PV2 OVP (PV2 over voltage protection)	Err18	PV indicator red on	Intermitte nt beeps	Check if the PV open-circuit voltage is too high (greater than 500 V). The alarm is released when the PV open-circuit voltage is below 480 V.
4	PV2 OCP (PV2 over current protection)	Err20			
5	PV HARD FAULT (PV hardware fault)	Err30	PV indicator		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,
6	PV1TS NC (PV1 temperature sensor no connection)	Err43	green on		please contact our technical support.
7	PV1 PCTO (PV1 pre-charge timeout)	Err52	PV		Turn off the inverter/charger first, wait for 5 minutes and then turn on the
8	PV2 PCTO (PV2 pre-charge timeout)	Err53	green on		please contact our technical support.

①The fault/status code is displayed in the "Status" column at the bottom right corner of the LCD. When multiple faults occur simultaneously, the LCD only displays the fault code with the smallest value.

②Set the "BuzzerAlert" as "ON," the buzzer will sound when a fault occurs. After the fault is eliminated, the buzzer will automatically mute. If the "BuzzerAlert" is set as "OFF," even if a fault occurs, the buzzer will not sound.

## 6.3 Inverter faults

No.	Fault/Status	Error code <sup>①</sup>	Indicator	Buzzer®	Solution
1	INV OCP (Inverter over current protection)	Err2	LOAD	Intermitte nt beeps	Check if the load actual power exceeds the rated power (namely, the inverter/charger's continuous output power), 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	INV OVP (Inverter over voltage protection)	Err7	red ON		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	INV OTP (Inverter over temperature protection)	Err10			Ensure the inverter/charger is installed in a cool and well-ventilated place.
4	HARD INV OVP (Inverter hardware over voltage protection)	Err22			
5	HARD INV OCP (Inverter hardware over current protection)	Err23			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.
6	INV VOLT OFFSET ERR (Inverter voltage offset error)	Err32			

No.	Fault/Status	Error code <sup>①</sup>	Indicator	Buzzer <sup>®</sup>	Solution
	INV CURR OFFSET ERR				Disconnect the load completely and turn off the inverter/charger. Wait 5
7	(Inverter current offset	Err35			minutes and then turn on the inverter/charger to check if it resumes
	error)				normal. If it is still abnormal, please contact our technical support.
	ITS NC (Internal		LOAD		Turn off the inverter/charger. Wait 5 minutes and then turn on the
8	temperature sensor no	Err45	indicator		inverter/charger to check if it resumes normal. If it is still abnormal,
	connection)		green ON		please contact our technical support.
9	INV UVP (Inverter under voltage protection)	Err49	LOAD indicator red ON	Intermitte nt beeps	Check if the load actual power exceeds the rated power (namely, the inverter/charger's continuous output power), 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	Step-up Unit OTP	Err60			Ensure the inverter/charger is installed in a cool and well-ventilated place.

①The fault/status code is displayed in the "Status" column at the bottom right corner of the LCD. When multiple faults occur simultaneously, the LCD only displays the fault code with the smallest value.

②Set the "BuzzerAlert" as "ON," the buzzer will sound when a fault occurs. After the fault is eliminated, the buzzer will automatically mute. If the "BuzzerAlert" is set as "OFF," even if a fault occurs, the buzzer will not sound.

## 6.4 Utility faults

No.	Fault/Status	Error code <sup>①</sup>	Indicator	Buzzer <sup>2</sup>	Solution
1	AC OVP (AC over voltage protection)	Err8	GRID indicator red on	Intermittent beeps	Check if the utility voltage exceeds the "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	AC OCP (AC over current protection)	Err9	GRID indicator red on	Intermittent beeps	Check if the load actual power exceeds the "Inverter Rated Power (see chapter <u>8 Specifications</u> )," 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	AC UVP (AC under voltage protection)	Err25	GRID indicator red on		Check if the utility voltage is lower than the "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.
4	AC PRECHG OUT (AC pre-charge timeout)	Err28			Check if the utility frequency in between the "Utility Under
5	AC RELAY Adhesion (AC relay adhesion. Namely, AC relay abnormal)	Err29	green on		Disconnect Frequency," disconnect the utility input and turn off the inverter/charger. Wait 5 minutes and then turn on the
6	AC FREQ ERR (AC frequency error)	Err31	GRID indicator red on	Intermittent beeps	please contact our technical support.

①The fault/status code is displayed in the "Status" column at the bottom right corner of the LCD. When multiple faults occur simultaneously, the LCD only displays the fault code with the smallest value.

(2)Set the "BuzzerAlert" as "ON," the buzzer will sound when a fault occurs. After the fault is eliminated, the buzzer will automatically mute. If the "BuzzerAlert" is set as "OFF," even if a fault occurs, the buzzer will not sound.

### 6.5 Load faults

No.	Fault/Status	Error code <sup>①</sup>	Indicator	Buzzer®	Solution
1	LAOD CURR OFFSET ERR (Load current	Err33			Disconnect the load completely and turn off the inverter/shareer
	offset error)				
2	OVERLOAD (Overload)	Err48	LOAD	Intermitt	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
3	OVERLOAD LOCK (Overload lock)	Err55	red ON	beeps	support.

①The fault/status code is displayed at the "Status" column at the bottom right corner of the LCD interface. When multiple faults occur simultaneously, the LCD only displays the fault code with the smallest value.

②Set the "BuzzerAlert" as "ON"; the buzzer will sound when a fault occurs. After the error is eliminate, the buzzer will automatically mute. If the "BuzzerAlert" is set as "OFF," even if a fault occurs, the buzzer will not sound.

## 6.6 Other faults for single inverter/charger

No.	Fault/Status	Error code <sup>①</sup>	Indicator	Buzzer	Solution										
1	BUS OVP (DC bus over voltage protection)	Err0			Turn off the inverter/charger. Wait 5 minutes and then turn on the										
2	BUS UVP (DC bus under voltage protection)	Err6			please contact our technical support.										
3	AMBIENT OTP (Ambient over temperature protection)	Err12			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	HARD OVP (Hardware over voltage protection)	Err21													
5	BAT CHG OCP (Battery charge over current protection)	Err24													
6	CHG CURR OFFSET ERR (Charge current offset error)	Err36													Iurn 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.
7	PUSH DRV ERR (Push driver error)	Err38													
8	APS ERR (Auxiliary power supply error)	Err40													
9	ATS NC (Ambient temperature sensor no connection)	Err42			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.										

No.	Fault/Status	Error code <sup>①</sup>	Indicator	Buzzer	Solution
10	LIMITCHG (Low temperature limit charging)	Err46			Check whether the ambient temperature is lower than the set "Charge
11	LIMITDISCHG (Low temperature limit discharging)	Err47		-	low temperature limit" and "Discharge low temperature limit."
12	EEP ERR (EEPROM error)	Err54			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.

①The fault/status code is displayed at the "Status" column at the bottom right corner of the LCD interface. When multiple faults occur simultaneously, the LCD only displays the fault code with the smallest value.

### 6.7 BMS faults

No.	Fault/Status	Error code <sup>®</sup>	Indicator	Buzzer	Solution
1	BMS OVP (BMS over voltage protect)	Err66			
2	BMS Chage TEMP ERR (BMS charge temperature error)	Err68			
3	BMS UVP (BMS under voltage protect)	Err69			Check the BMS communication
4	BMS DisChageTEMP ER (BMS discharge temperature error)	Err71			status or BMS setting parameters.
5	BMS COM ERR (BMS communication error)	Err74	]		

①The fault/status code is displayed in the "Status" column at the bottom right corner of the LCD. When multiple faults occur simultaneously, the LCD only displays the fault code with the smallest value.

# 7 Maintenance

- 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.



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

# 8 Specifications

# 8.1 UC Series

Model	UC3542-0650P20	UC5542-1050P20				
Utility input						
Litility (pour ) (oltage	176VAC to 20	64VAC (Default)				
	90VAC to 285V	AC (Configurable)				
Utility Input Frequency	45Hz to 65Hz					
Maximum Utility Charging Current	60A	100A				
	Switch Response Time	e – Inverter to Utility: 10ms				
Switch Response Time	Switch Response Time – U	tility to Inverter (when the load				
	power is higher	than 100W): 20ms				
Utility output						
Rated Output Voltage	220/23	0VAC±3%				
Utility Output Frequency	50/60	Hz±0.2%				
Rated Output Power	100W to 3500W	100W to 5500W				
	(Default: 2300W)	(Default: 3400W)				
Power Factor	(	0.99				
Inverter output						
Inverter Rated Power (@30°C)	3500W	5500W				
3-second Transient Surge Output	7000\//	8500\//				
Power	100011	000011				
Inverter Output Voltage	220/23	220/230VAC±3%				
Inverter Frequency	50/60Hz±0.2%					
Output Voltage Waveform	Pure sine wave					
Load Power Factor	$0.2-1$ (VA $\leq$ Rated output power)					
THDu (Total Harmonic Voltage	<3% (18)/ resistive load)					
Distortion)						
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 "Under Vol	Itage Warning Voltage"				
Second Output Cut-Off Voltage	Equal to "Low Voltage Disconnect Voltage"					
Dual Output Recovery Voltage	Equal to "Low Voltage Reconnect Voltage"					
Solar controller						
PV Maximum Open-circuit	500V (At minimum operating environment temperature)					
Voltage	440V (At 25°C)					
MPPT Voltage Range	85V to 450V					

PV Maximum Input Current         One way, 16A         Two ways, 2x16A           PV Maximum Short-circuit         One way, 18A         Two ways, 2x18A           Current         One way, 18A         Two ways, 2x18A
PV Maximum Short-circuit Current One way, 18A 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 60A 100A
Others
≤0.8A ≤1.1A
No-load Losses Test condition: Utility, PV and Load are disconnected, AC
output is ON, fan stops, @48V input
≤0.6A ≤0.8A
Standby Current 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
-20°C to +50°C (When the environment temperature exceeds
30°C, the actual output power is reduced appropriately)
Storage Temperature Range -25°C to +60°C
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 534mm × 300mm × 163mm 590mm × 300mm × 163mm
Mounting size (Length x Width) 512mm × 245mm 568mm × 245mm
Mounting hole size
Net Weight 12.7Kg 15.5Kg

Model	UC3522-1250P20		
Utility input			
Litility Input Voltage	176VAC to 264VAC (Default)		
Otility input voltage	90VAC to 285VAC (Configurable)		
Utility Input Frequency	45Hz to 65Hz		

Maximum Utility Charging	110A		
	Switch Response Time – Inverter to Utility: 10ms		
Switch Response Time	Switch Response Time – Utility to Inverter (when the load		
	power is higher than 100W): 20ms		
Utility output			
Rated Output Voltage	220/230VAC±3%		
Utility Output Frequency	50/60Hz±0.2%		
Rated Output Power	100W to 3500W (Default: 2300W)		
Power Factor	0.99		
Inverter output			
Inverter Rated Power (@30°C)	3500W		
3-second Transient Surge Output	700014		
Power	700000		
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)	S3% (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 "Under Voltage Warning Voltage"		
Second Output Cut-Off Voltage	Equal to "Low Voltage Disconnect Voltage"		
Dual Output Recovery Voltage	Equal to "Low Voltage Reconnect Voltage"		
Solar controller			
PV Maximum Open-circuit	500V (At minimum operating environment temperature)		
Voltage	440V (At 25°C)		
MPPT Voltage Range	85V to 450V		
Number of MPPTs	1		
PV Maximum Input Current	One way, 16A		
PV Maximum Short-circuit	0		
Current	One way, 18A		
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	
	≤1.5A
No-load Losses	Test condition: Utility, PV and Load are disconnected, AC
	output is ON, fan stops, @24V input
	≤1.1A
Standby Current	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°C to +50°C (When the environment temperature exceeds
	30°C, the actual output power is reduced appropriately)
Storage Temperature Range	-25°C to +60°C
Enclosure	IP20 (With ANTI-DUST KIT)
Relative Humidity	< 95% (N.C.)
Altitude	<4000M (If the altitude exceeds 2000 meters, the actual output
Altitude	power is reduced appropriately)
Certifications and Standards	IEC 62109-1, IEC 62109-2, IEC 61683, IEC 62368
Mechanical parameters	
Dimension (Length x Width x	500mm x 300mm x 163mm
Height)	
Mounting size (Length x Width)	568mm × 245mm
Mounting hole size	Ф9mm/Ф10mm
Net Weight	13.8Kg

## 8.2 UCP Series

Model	UCP3542-0650P20	UCP5542-1050P20
Utility input		
Utility Input Voltage	176VAC to 2	264VAC (Default)
	90VAC to 285	VAC (Configurable)
Utility Input Frequency	45Hz	z to 65Hz
Maximum Utility Charging	<u> </u>	1004
Current	60A	100A
	Switch Response Time	e – Inverter to Utility: 10ms
Switch Response Time	Switch Response Time – Utility to Inverter (when the load	
	power is higher	r than 100W): 20ms
Utility output		
Rated Output Voltage	220/23	80VAC±3%
Utility Output Frequency	50/60	0Hz±0.2%

Rated Output Power	100W to 3500W	100W to 5500W	
	(Default: 2300W)	(Default: 3400W)	
Power Factor	0.99		
Inverter output			
Inverter Rated Power (@30°C)	3500W	5500W	
3-second Transient Surge Output Power	7000W	8500W	
Inverter Output Voltage	220/23	80VAC±3%	
Inverter Frequency	50/60	50/60Hz±0.2%	
Output Voltage Waveform	Pure sine wave		
Load Power Factor	0.2−1(VA≤R	ated 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 "Under Vo	bltage Warning Voltage"	
Second Output Cut-Off Voltage	Equal to "Low Volta	age Disconnect Voltage"	
Dual Output Recovery Voltage	Equal to "Low Volta	age Reconnect Voltage"	
Solar controller			
PV Maximum Open-circuit	500V (At minimum operat	ing environment temperature)	
Voltage	440V	(At 25°C)	
MPPT Voltage Range	85V	85V to 450V	
Number of MPPTs	1	2	
PV Maximum Input Current	One way, 20A	Two ways, 2x20A	
PV Maximum Short-circuit Current	One way, 22A	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	4	8VDC	
Battery Work Voltage Range	40.8VDC to 64.0VDC		
Battery Maximum Charging Current	60A	100A	
Others			
	≤0.8A	≤1.1A	
No-load Losses	Test condition: Utility, PV and Load are disconnected, AC		
Standby Current	≤0.6A	≤0.8A	

	Test condition: Utility, PV a	and Load are disconnected, AC
	output is OFF, fa	an stops, @48V input
Communication with BMS	F	RS485
Communication with Portal	F	RS485
Parallel Function	Yes, 12 units in sta	indard, 16 units at most
Work Temperature Range	-20°C to +50°C (When the e	nvironment temperature exceeds
	30°C, the actual output power is reduced appropriately)	
Storage Temperature Range	-25°C	to +60°C
Enclosure	IP20 (With	ANTI-DUST KIT)
Relative Humidity	< 95	i% (N.C.)
Altitude	<4000M (If the altitude exceeds 2000 meters, the actual output	
	power is reduced appropriately)	
Certifications and Standards	IEC 62109-1, IEC 6210	9-2, IEC 61683, IEC 62368
Mechanical parameters		
Dimension (Length x Width x	534mm × 300mm ×	500 000 100
Height)	163mm	590mm × 300mm × 163mm
Mounting size (Length x Width)	512mm × 245mm	568mm × 245mm
Mounting hole size	Φ9mm/Φ10mm	Ф9mm/Ф10mm
Net Weight	12.7Kg	15.5Kg

Model	UCP3522-1250P20	
Utility input		
Utility Input Voltage	176VAC to 264VAC (Default)	
	90VAC to 285VAC (Configurable)	
Utility Input Frequency	45Hz to 65Hz	
Maximum Utility Charging	110A	
Current		
	Switch Response Time – Inverter to Utility: 10ms	
Switch Response Time	Switch Response Time – Utility to Inverter (when the load	
	power is higher than 100W): 20ms	
Utility output		
Rated Output Voltage	220/230VAC±3%	
Utility Output Frequency	50/60Hz±0.2%	
Rated Output Power	100W to 3500W (Default: 2300W)	
Power Factor	0.99	
Inverter output		
Inverter Rated Power (@30°C)	3500W	
3-second Transient Surge Output	7000W	
Power		
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 "Under Voltage Warning Voltage"
Second Output Cut-Off Voltage	Equal to "Low Voltage Disconnect Voltage"
Dual Output Recovery Voltage	Equal to "Low Voltage Reconnect Voltage"
Solar controller	
PV Maximum Open-circuit	500V (At minimum operating environment temperature)
Voltage	440V (At 25℃)
MPPT Voltage Range	85V to 450V
Number of MPPTs	1
PV Maximum Input Current	One way, 20A
PV Maximum Short-circuit	
Current	One way, 22A
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	1204
Current	120A
Others	
	≤1.5A
No-load Losses	Test condition: Utility, PV and Load are disconnected, AC
	output is ON, fan stops, @24V input
	≤1.1A
Standby Current	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°C to +50°C (When the environment temperature exceeds
	30°C, 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	590mm × 300mm × 163mm	
Height)		
Mounting size (Length x Width)	568mm × 245mm	
Mounting hole size	Ф9mm/Ф10mm	
Net Weight	13.8Kg	

# 9 Dimensions

Model: UC3522-1250P20/UCP3522-1250P20 (Unit: mm)





#### Model: UC3542-0650P20/UCP3542-0650P20 (Unit: mm)







Model: UC5542-1050P20/UCP5542-1050P20 (Unit: mm)





Any changes without prior notice! Version number: V1.0

## HUIZHOU EPEVER TECHNOLOGY CO., LTD.

Tel: +86-752-3889706

E-mail: info@epever.com

Website: www.epever.com