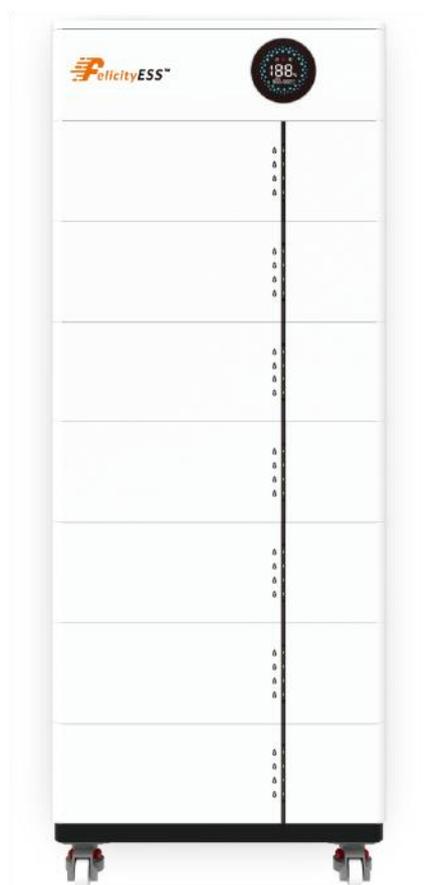




USER GUIDE

Household Low-Voltage Energy Storage System



In order to prevent improper operation before use, please carefully read this manual.

Household low-voltage energy storage system

About this manual

1. Purpose

This manual describes the introduction, installation, operation and emergency situations of the Megafelicity ESS series. Please read this manual carefully before installations and operations. Keep this manual for future reference.

2. Model Description

Inverter:

V-SKY-R5KLNA-US	V-SKY-R6KLNA-US	V-SKY-R7K6LNA-US	V-SKY-R8KLNA-US	V-SKY-R10KLNA-US
-----------------	-----------------	------------------	-----------------	------------------

Naming rules, For example: V-SKY-R7K6LNA-US

“7K6、5K” means “output power 7.6kw or 5kw”

“L” means “low battery voltage.”

“NA” means “North America”

“US” America

Battery:

Model	Description	Notes
LUX-X-48100LCG01-US	Control Module	Can be used separately
LUX-X-48100LMG01-US	Battery Module	It needs to be used with LUX-X-48100LCG01-US
LUX-X-48100LG01-USM 2	LUX-X-48100LCG01*1PCS-US+LUX-X-48100LMG01-US*1PCS	Max.4 pcs in Parallel (19.92kWh) for Residential use ESS
LUX-X-48100LG01-USM 3	LUX-X-48100LCG01*1PCS-US+LUX-X-48100LMG01-US*2PCS	
LUX-X-48100LG01-USM 4	LUX-X-48100LCG01*1PCS-US+LUX-X-48100LMG01-US*3PCS	
LUX-X-48100LG01-USM 5	LUX-X-48100LCG01*1PCS-US+LUX-X-48100LMG01-US*4PCS	
LUX-X-48100LG01-USM 6	LUX-X-48100LCG01*1PCS-US+LUX-X-48100LMG01-US*5PCS	Max.8 pcs in Parallel (39.84kWh) for Non-residential use ESS
LUX-X-48100LG01-USM 7	LUX-X-48100LCG01*1PCS-US+LUX-X-48100LMG01-US*6PCS	
LUX-X-48100LG01-USM 8	LUX-X-48100LCG01*1PCS-US+LUX-X-48100LMG01-US*7PCS	

Household low-voltage energy storage system

System:

<i>Model</i>	<i>Description</i>
Megafelicity Ess R5KLNA-US-5kWh	1*V-SKY-R5KLNA-US+1*LUX-X-48100LCG01-US
Megafelicity Ess R5KLNA-US-10kWh	1*V-SKY-R5KLNA-US+1*LUX-X-48100LG01-USM2
Megafelicity Ess R5KLNA-US-15kWh	1*V-SKY-R5KLNA-US+1*LUX-X-48100LG01-USM3
Megafelicity Ess R5KLNA-US-20kWh	1*V-SKY-R5KLNA-US+1*LUX-X-48100LG01-USM4
Megafelicity Ess R5KLNA-US-25kWh	1*V-SKY-R5KLNA-US+1*LUX-X-48100LG01-USM5
Megafelicity Ess R5KLNA-US-30kWh	1*V-SKY-R5KLNA-US+1*LUX-X-48100LG01-USM6
Megafelicity Ess R5KLNA-US-35kWh	1*V-SKY-R5KLNA-US+1*LUX-X-48100LG01-USM7
Megafelicity Ess R5KLNA-US-40kWh	1*V-SKY-R5KLNA-US+1*LUX-X-48100LG01-USM8
Megafelicity Ess R6KLNA-US-5kWh	1*V-SKY-R6KLNA-US+1*LUX-X-48100LCG01-US
Megafelicity Ess R6KLNA-US-10kWh	1*V-SKY-R6KLNA-US+1*LUX-X-48100LG01-USM2
Megafelicity Ess R6KLNA-US-15kWh	1*V-SKY-R6KLNA-US+1*LUX-X-48100LG01-USM3
Megafelicity Ess R6KLNA-US-20kWh	1*V-SKY-R6KLNA-US+1*LUX-X-48100LG01-USM4
Megafelicity Ess R6KLNA-US-25kWh	1*V-SKY-R6KLNA-US+1*LUX-X-48100LG01-USM5
Megafelicity Ess R6KLNA-US-30kWh	1*V-SKY-R6KLNA-US+1*LUX-X-48100LG01-USM6
Megafelicity Ess R6KLNA-US-35kWh	1*V-SKY-R6KLNA-US+1*LUX-X-48100LG01-USM7
Megafelicity Ess R6KLNA-US-40kWh	1*V-SKY-R6KLNA-US+1*LUX-X-48100LG01-USM8
Megafelicity Ess R7K6LNA-US-5kWh	1*V-SKY-R7K6LNA-US+1*LUX-X-48100LCG01-US
Megafelicity Ess R7K6LNA-US-10kWh	1*V-SKY-R7K6LNA-US+1*LUX-X-48100LG01-USM2
Megafelicity Ess R7K6LNA-US-15kWh	1*V-SKY-R7K6LNA-US+1*LUX-X-48100LG01-USM3
Megafelicity Ess R7K6LNA-US-20kWh	1*V-SKY-R7K6LNA-US+1*LUX-X-48100LG01-USM4
Megafelicity Ess R7K6LNA-US-25kWh	1*V-SKY-R7K6LNA-US+1*LUX-X-48100LG01-USM5
Megafelicity Ess R7K6LNA-US-30kWh	1*V-SKY-R7K6LNA-US+1*LUX-X-48100LG01-USM6
Megafelicity Ess R7K6LNA-US-35kWh	1*V-SKY-R7K6LNA-US+1*LUX-X-48100LG01-USM7
Megafelicity Ess R7K6LNA-US-40kWh	1*V-SKY-R7K6LNA-US+1*LUX-X-48100LG01-USM8
Megafelicity Ess R8KLNA-US-5kWh	1*V-SKY-R8KLNA-US+1*LUX-X-48100LCG01-US
Megafelicity Ess R8KLNA-US-10kWh	1*V-SKY-R8KLNA-US+1*LUX-X-48100LG01-USM2
Megafelicity Ess R8KLNA-US-15kWh	1*V-SKY-R8KLNA-US+1*LUX-X-48100LG01-USM3
Megafelicity Ess R8KLNA-US-20kWh	1*V-SKY-R8KLNA-US+1*LUX-X-48100LG01-USM4
Megafelicity Ess R8KLNA-US-25kWh	1*V-SKY-R8KLNA-US+1*LUX-X-48100LG01-USM5
Megafelicity Ess R8KLNA-US-30kWh	1*V-SKY-R8KLNA-US+1*LUX-X-48100LG01-USM6
Megafelicity Ess R8KLNA-US-35kWh	1*V-SKY-R8KLNA-US+1*LUX-X-48100LG01-USM7
Megafelicity Ess R8KLNA-US-40kWh	1*V-SKY-R8KLNA-US+1*LUX-X-48100LG01-USM8
Megafelicity Ess R10KLNA-US-5kWh	1*V-SKY-R10KLNA-US+1*LUX-X-48100LCG01-US
Megafelicity Ess R10KLNA-US-10kWh	1*V-SKY-R10KLNA-US+1*LUX-X-48100LG01-USM2
Megafelicity Ess R10KLNA-US-15kWh	1*V-SKY-R10KLNA-US+1*LUX-X-48100LG01-USM3
Megafelicity Ess R10KLNA-US-20kWh	1*V-SKY-R10KLNA-US+1*LUX-X-48100LG01-USM4
Megafelicity Ess R10KLNA-US-25kWh	1*V-SKY-R10KLNA-US+1*LUX-X-48100LG01-USM5
Megafelicity Ess R10KLNA-US-30kWh	1*V-SKY-R10KLNA-US+1*LUX-X-48100LG01-USM6
Megafelicity Ess R10KLNA-US-35kWh	1*V-SKY-R10KLNA-US+1*LUX-X-48100LG01-USM7
Megafelicity Ess R10KLNA-US-40kWh	1*V-SKY-R10KLNA-US+1*LUX-X-48100LG01-USM8

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1 Introduction

1.1 Safety Symbols & Warnings

The Megafelicity ESS series is designed, manufactured, and tested as per international safety standards. However, as an electrical and electric product, it must be installed, operated, and maintained strictly according to related safety notices.

If you have any problems, please contact the service center or authorized dealer.

Please DO NOT install or repair the product by anyone who is not qualified by local authority.

We are not responsible for any damage or loss caused by misuse or misunderstanding of the information in the manual.

1.1.1 Symbols Explanation

	The system will be touchable or operable after at least 10 minutes disconnected, in case of any electrical shock.		Install the product out of reach of children.
	Danger of high voltage and electric shock!		Do not place nor install near flammable or explosive materials.
	Danger of hot surface and burn injury!		In case of electrolyte leakage, keep leaked electrolyte away from eyes or skin.
	Earth line!		Disconnect the equipment before carrying out maintenance or repair.
	The wasted products must be sent to the authorized collecting center!		Do not connect the Pack's positive(+) and negative(-) terminal reversely.
	Refer to the operating instructions.		Societe Generale de Surveillance S.A.
	Danger! Serious physical injury or even death may occur if not follow the relative requirements.		Observe precautions for handling electrostatic discharge sensitive devices.
	CE mark: The inverter complies with the CE directive.		Do not use the Pack beyond specified conditions.
	Take care! This module is heavy enough to cause serious injury.	NOTE	Note: The procedures taken for ensuring proper operation.

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1.1.2 Safety Warning

 Warning	The system must be installed according to the local standards and related standards for an electrical enterprise. Please follow the instructions in this manual to use and operate the system.
 Danger	Keep the PV array covered and the DC circuit breaker OFF. High voltage will be generated by the PV array exposed under sunshine. All the cables must be connected firmly.
 Danger	PV negative(PV-) and battery negative(BAT-) on the system side are not grounded as default design. Connect PV- or BAT- to the ground are strictly forbidden.
 Danger	<ol style="list-style-type: none">1. High voltage is a hazard, make sure the system device is away from children.2. Any touch with the device or terminal may cause electric shock or fire. Please follow all the safety instructions.3. Damaged devices or system faults may cause electric shock. Make sure that you have checked the package and the device before installation to avoid unnecessary damage or loss.
 Caution	Be aware of the hot surface while the device is running.
 Warning	Do not open the inverter cover or change any components without our authorization, otherwise the warranty commitment of the inverter will be invalid.
 Warning	<ol style="list-style-type: none">1. Grounding the PV generator.2. Comply with the local requirements for grounding the PV modules and the PV generator. It is recommends connecting the generator frame and other electrically conductive surfaces in a manner which ensures continuous conduction and ground these in order to have optimal protection of system and persons
 Warning	<ol style="list-style-type: none">1. Ensure input DC voltage \leqMax. DC voltage. Over voltage may cause damage.2. Permanent damage to inverter or other losses, which will not be included in warranty!
 Warning	<ol style="list-style-type: none">1. Authorized service personnel must disconnect both AC and DC power from inverter before attempting any maintenance or cleaning or working on any circuits connected to inverter.2. Do not operate the inverter when the device is running.

Household low-voltage energy storage system

1.1.3 Battery Handling Guide

- Use the battery pack only as directed.
- If the battery is defective, appears cracked, broken, or otherwise damaged, or fails to operate, contact the Megafelicity ESS **hotline** immediately.
- Do not attempt to open, disassemble, repair, tamper, or modify the battery.

The battery is not suitable for users to use by themselves.

- To protect the battery and its components from damage when transporting, handle them with care.
- Do not subject it to any strong force.
- Do not insert foreign objects into any part of the battery pack.
- Do not use cleaning solvents to clean the battery.
- The battery can not be connected directly to the SELV circuit.

1.2 Response to Emergency Situations

The Felicity ESS battery is designed with multiple safety strategies to prevent hazards resulting from failures. However, Felicity ESS cannot guarantee their absolute safety in uncertain situations.

1.2.1 Leaking Batteries

If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas. Electrolyte is corrosive and contact may cause skin irritation and chemical burns. If one is exposed to the leaked substance, do these actions:

Inhalation: Evacuate the contaminated area and seek medical attention immediately.

Eyes contact: Rinse eyes with flowing water for 15 minutes, and seek medical attention immediately.

Skin contact: Wash the affected area thoroughly with soap and water, and seek medical attention immediately.

Ingestion: Induce vomiting as soon as possible, and seek medical attention immediately.

1.2.2 Fire

In case of a fire, make sure that an ABC or carbon dioxide extinguisher is

nearby and does not use water to extinguish the fire.



Household low-voltage energy storage system

WARNING

The battery pack may catch fire when heated above 150°

If a fire breaks out where the battery is installed, do these actions:

1. Extinguish the fire before the battery catches fire.
2. If the battery has caught fire, do not try to extinguish the fire. Evacuate people immediately.

WARNING

If the battery catches fire, it will produce poisonous gases. Do not approach.

1.2.3 Wet Battery

If the battery is wet or submerged in water, do not try to access it. Contact Felicity ESS **hotline** or your distributor for technical assistance.

1.2.4 Damaged Battery

If the battery is damaged, please contact Felicity ESS **hotline** or your distributor for help as soon as possible, because damaged batteries are dangerous and must be handled with extreme caution. Damaged batteries are not suitable for use and may pose a danger to people or property. If the battery seems to be damaged, return it to Felicity ESS or your distributor.

CAUTION

Damaged batteries might export electrolyte or flammable gas, so contact Felicity ESS for advice and information immediately and we will deal with it.

1.3 Installers

Megafelicity ESS series is suggested being installed by skilled workers or electricians.

A skilled worker is defined as a person who has been trained and is a qualified electrician or qualified with all of the following skills and experience:

- Knowledge of the functional principles and operation of on-grid Megafelicity ESS series.
- Knowledge of the dangers and risks associated with installing and using electrical devices and acceptable mitigation methods.
- Knowledge of the installation of electrical devices
- Knowledge of and adherence to this manual and all safety precautions and best practices.

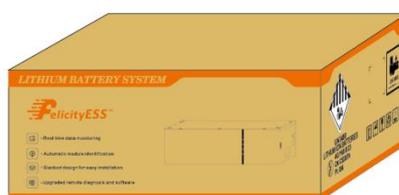
1.4 Scrap Battery

For scrap batteries, please deal with local laws or regulations to recycle or scrap.

Household low-voltage energy storage system

2 Guidance for Disconnection of System During Shipment

- Felicity ESS is not suitable for air transport.
- Cartons that have been crushed, punctured, or torn in such a way that contents are revealed shall be set aside in an isolated area and inspected by a skilled person. If the package is deemed not to be shippable, the contents shall be promptly collected, segregated, and either the consignor or consignee contacted.
- A precautionary label should have been affixed to the shipping carton to alert individuals that the batteries in the package are disconnected; otherwise, the battery should not be transported.
- We have conducted comprehensive tests to ensure the equipment distributed around the world is safe for shipping transport. These products shall be handled with care and immediately inspected if visibly damaged. If the carton is visibly damaged, please contact with Felicity ESS **customer service** to confirm whether the battery can be used safely or not.



NOTE

The battery module can only be transported in an upright position.

3 Product Introduction

3.1 Technical Specifications

Inverter:

Technical Data	V-SKY-R5KLNA-US	V-SKY-R6KLNA-US	V-SKY-R7K6LNA-US	V-SKY-R8KLNA-US	V-SKY-R10KLNA-US
PV Input Data					
Max. DC Input Power	7.5kW	9kW	12kW	12kW	15kW
NO. MPPT Tracker	4				
MPPT Range	120 - 500V				
Max. DC Input Voltage	500V				
Max. Input Current	14A				
Battery Input Data					
Nominal voltage (Vdc)	48V	48V	48V	48V	48V
Max. Charging/Discharging Current	120A/120A	135A/135A	190A/190A	190A/190A	190A/210A
Battery Voltage Range	40-60V				
Battery Type	Lithium and Lead Acid Battery				
Charging Strategy for Li-Ion Battery	Self-adaption to BMS				
AC Output Data (On-Grid)					
Nominal output power Output to Grid	5kVA	6kVA	7.6kVA	8kVA	10kVA

Household low-voltage energy storage system

Max. Apparent Power Output to Grid	5.5kVA	6.6kVA	8.4kVA	8.8kVA	11kVA
Output Voltage Range	110-120/220-240V split phase, 1Ø, 230 1 phase				
Output Frequency	50/60Hz (45 to 54.9Hz / 55 to 65Hz)				
Nominal AC Current Output to Grid	20.8A	25A	31.7A	33.3A	41.7A
Max.AC Current Output to Grid	22.9A	27.5A	35A	36.7A	45.8A
Output Power Factor	0.8leading...0.8lagging				
Output THDI	< 2%				
Max. Grid Pass through Current	100A				
AC Output Data (Back-Up)					
Nominal. Apparent Power Output	5kVA	6kVA	7.6kVA	8kVA	10kVA
Max. Apparent Power Output	5.5kVA	6.6kVA	8.4kVA	8.8kVA	11kVA
Nominal Output Voltage L-N/L1-L2	120/240V				
Nominal Output Frequency	60Hz				
Output THDU	< 2%				
Efficiency					
Europe Efficiency	≥97.8%				
Max. Battery to Load Efficiency	≥97.2%				
Protection					
Grounding detection	YES				
Arc Fault Protection	YES				
Island Protection	YES				
Battery reverse Polarity	YES				
Insulation Resistor Detection	YES				
Residual Current Monitoring Unit	YES				
Output Over Current Protection	YES				
Back-up Output Short Protection	YES				
Output Over Voltage Protection	YES				
Output Under Voltage Protection	YES				
General Data					
Output Conduit	25.4mm				
PV Input Conduit	25.4mm				
BAT Input Conduit	34.5mm				
Operating Temperature Range	-25 ~ +60°C (> 45°C derating)				
Relative Humidity	0-95%				
Operating Altitude	0~4000m				

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Ingress Protection	IP65/Type 3R
Weight	48kg
Size (Width*Height*Depth)	450mm x 820mm x 240mm
Cooling	Natural Convection
Noise emission	<38dB
Display	LED
Communication With BMS/Meter/EMS	RS485, CAN
Supported communication interface	RS485, WLAN, 4G (optional)
Self-consumption at night	< 25 W
Safety	UL1741SA all options, UL1699B, CSA 22.2
EMC	FCC Part 15 Class
Grid connection standards	IEEE 1547, IEEE 2030.5, Hawaii Rule 14H, Rule 21 Phase I, II, III

Battery:

Model	LUX-X-48	LUX-X-48	LUX-X-48	LUX-X-48	LUX-X-48	LUX-X-48	LUX-X-48	LUX-X-48	LUX-X-48
	100LCG0 1-US	100LMG0 1-US	100LG01- USM2	100LG01- USM3	100LG01- USM4	100LG01- USM5	100LG01- USM6	100LG01- USM7	100LG01- USM8
Battery Type	LiFePO4								
Module Nominal Energy	4.98kWh								
Module Nominal Capacity	97.3Ah								
Module Nominal Voltage	51.2V								
Number of Battery Modules	1	1	2	3	4	5	6	7	8
System Nominal Energy	4.98 kWh	4.98 kWh	9.96 kWh	14.94 kWh	19.92 kWh	24.9 kWh	29.88 kWh	34.86 kWh	39.84 kWh
System Nominal Voltage	51.2V								
System Operating Voltage	44.8~57.6V								
Recommend Charge/Discharge Current	50A	50A	100A	150A	200A	250A	300A	350A	400A
Max.continuous charge/Discharge current[1]	60A	60A	120A	180A	240A	300A	360A	400A	400A
Peak Charge/Discharge Current(15s)	100A	100A	200A	300A	400A	500A	600A	700A	800A
Scalability	Max.8 pcs in Parallel(39.84kWh)								
Depth of Discharge(DOD)	≥ 95%								
Protection Level	IP21								
Working Temperature Range	Charge: 0°C~+55°C Discharge:-20°C~+55°C								
Storage Temperature Range	0°C~+35°C								
Humidity	5%~95%								
Altitude	≤ 2000m								
Communication	RS485 / CAN								

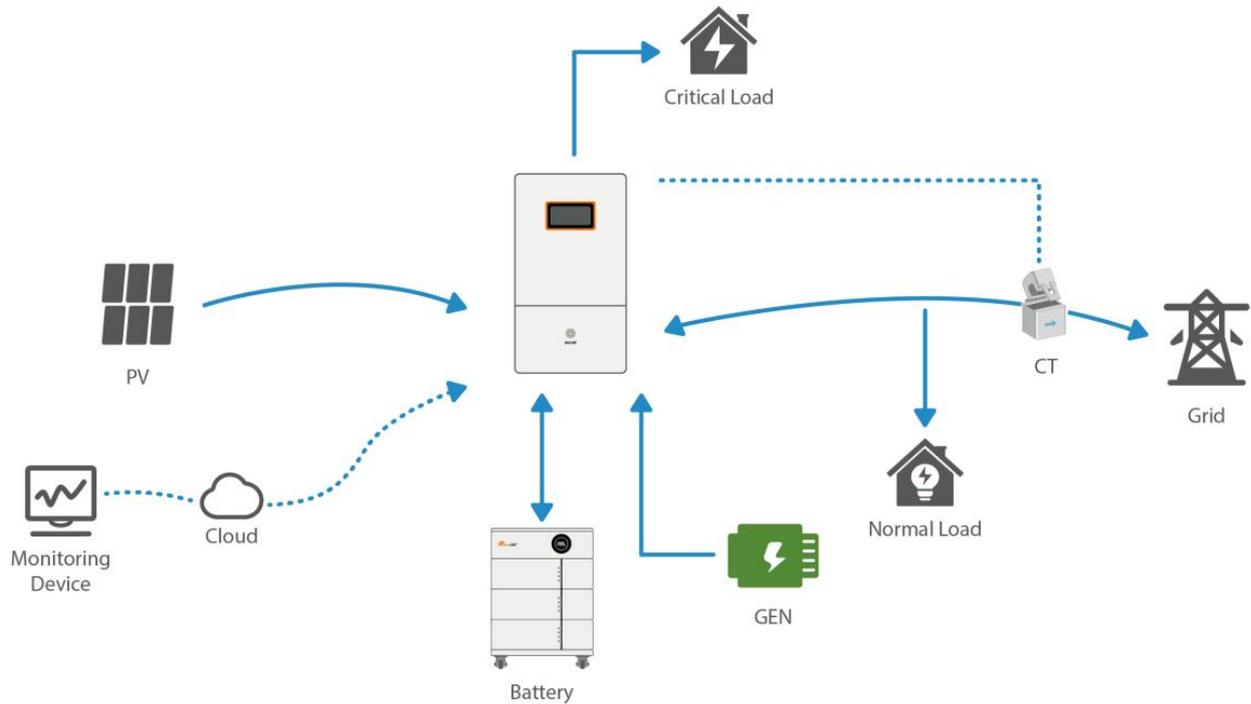
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Cycle Life[2]		≥ 6000 Cycles
Installation		Wall-Mounted / Floor-Mounted
Protection		Built-in smart BMS, Breaker, Fuse
Warranty Period[3]		10 Years
Battery Designation[4]		IFpP/54/150/120/((1P16S)NP)M/-20+50/90
Control Module LUX-X-48 100LCG0 1-US	Product Weight	46kg
	Package Weight (with base)	60kg
	Product Dimension	600x450x180mm
	Package Dimension (with base)	712x562x333mm
Battery Module LUX-X-48 100LMG0 1-US	Product Weight	46kg
	Package Weight	50kg
	Product Dimension	600x450x180mm
	Package Dimension	712x562x298mm
[1] Max.continuous charge/Discharge current is affected by temperature and SOC.		
[2] Test conditions: 0.2C Charging/Discharging @25°C, 80% DOD.		
[3] Conditions apply, refer to Felicity Household low-voltage energy storage system Warranty policy.		
[4] "N" means the number of battery packs connected parallel and should not exceed 8.(N≤8)		

Household low-voltage energy storage system

3.2 Megafelicity ESS series Diagram

Megafelicity ESS series is designed with two BACK-UP versions for customer to choose based on the local rules. This applies to the wiring rules that requires Neutral line of alternative supply must NOT be isolated or switched.



NOTE

- Please control the home loads and make sure it's within the "BACK-UP output rating" under BACK-UP mode, otherwise the inverter will shut down with an "overload fault" warning.
- Please confirm with the LOCAL grid operator whether there are any special regulations for grid connection.

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3.3 Operation Modes Introduction

Megafelicity ESS series normally has the following operation modes based on your configuration and layout conditions.

Working Mode		Designation	Definition
Self Used Mode	In the 'Hybrid work mode' menu, select 'Self-used mode' which prioritizes PV energy for local loads, then battery charging, and finally feeding excess energy into the grid. This default mode increases self-consumption rate and has various scenarios based on PV energy.	Wealthy PV Energy	Excess PV energy powers loads, charges battery, then feeds excess energy into the grid when PV energy is abundant.
		Limited PV Power	PV energy used for loads first, then battery used for any shortfall, and finally grid energy fills remaining gaps.
		No PV Input	The inverter uses battery energy for home load when there is no PV input, then switches to grid energy.
Peak Shift Mode	<p>Navigate to 'Hybrid work mode' and choose 'Peak Shift Mode'. This mode allows control of inverter charging and discharging with customized parameters.</p> <p>Charge and discharge frequency: one time or daily</p> <p>Charging start time: 0 to 24 hours</p> <p>Charging end time: 0 to 24 hours</p> <p>Discharge start time: 0 to 24 hours</p> <p>Discharge end time: 0 to 24 hours</p> <p>Users can choose to enable or disable grid charging for the battery. If the 'Grid charge function' is enabled, users can set the 'Maximum grid charger power' and 'Capacity of grid charger end'.</p>	During the charging time	<p>If there is sufficient sunlight, it will charge the battery first, and then supply power to the loads, if has excess power, then feed the power into grid if still has excess power.</p> <p>If there is not have enough sunlight, it will charge the battery from grid.</p>
		During the discharging time	<p>If there is sufficient sunlight, power the loads first.</p> <p>If there is insufficient sunlight, the battery supplies the power to the loads first until the battery is consumed to the SOC value that you set before, if there is still not enough, get the power from grid. If load power is less than battery, the battery supply power to load at first and then feed the power into grid with excess.</p>

Household low-voltage energy storage system

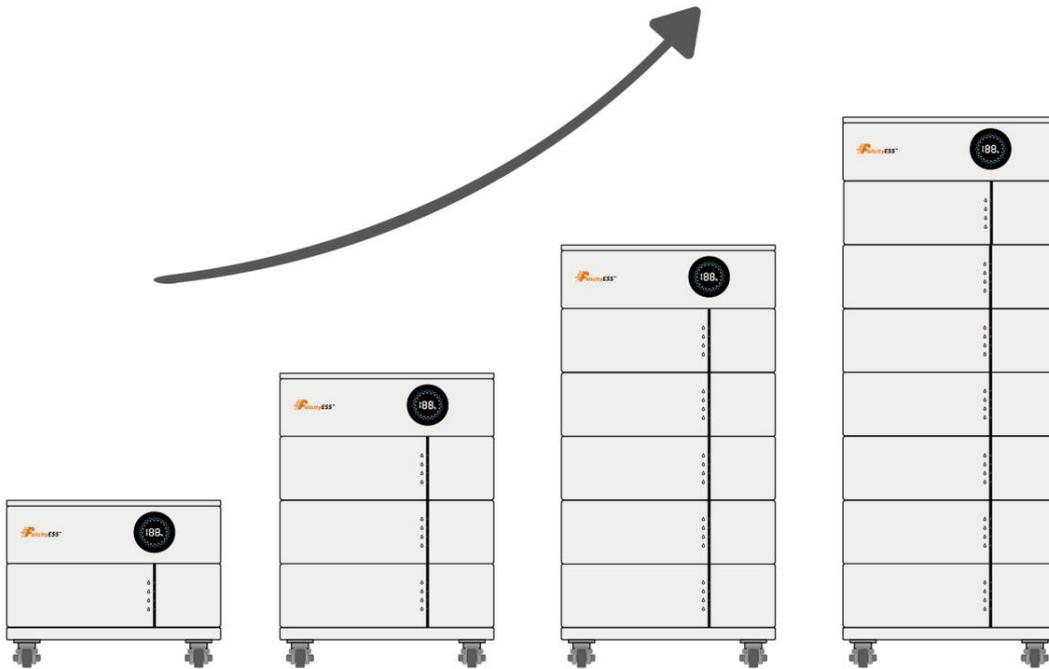
Battery Priority Mode	In the 'Hybrid work mode' menu, choose 'Back-up Charge' for faster battery charging with priority on PV energy. Optional AC charging.	When PV, Grid, Battery is available	When there is sufficient sunlight, the device first supplies power to battery, if there is still excess power, it will supply power to loads, and feed the power into the grid with excess power.
		No PV	It will get power from grid to charge battery fully

NOTE	
●	If set anti-Reverse function allowable, Once on the work mode of Self-use, Peak shift, battery priority, the system will not feed power to grid.
●	In addition to the above three basic modes, there is also an “Advanced Mode”.

3.4 Indicators and Ports

3.4.1 Battery

Product Overview



Features:

LiFePO4: Higher safe performance and longer cycle life.

Multiple Protection: Built-in smart BMS, Breaker and Fuse.

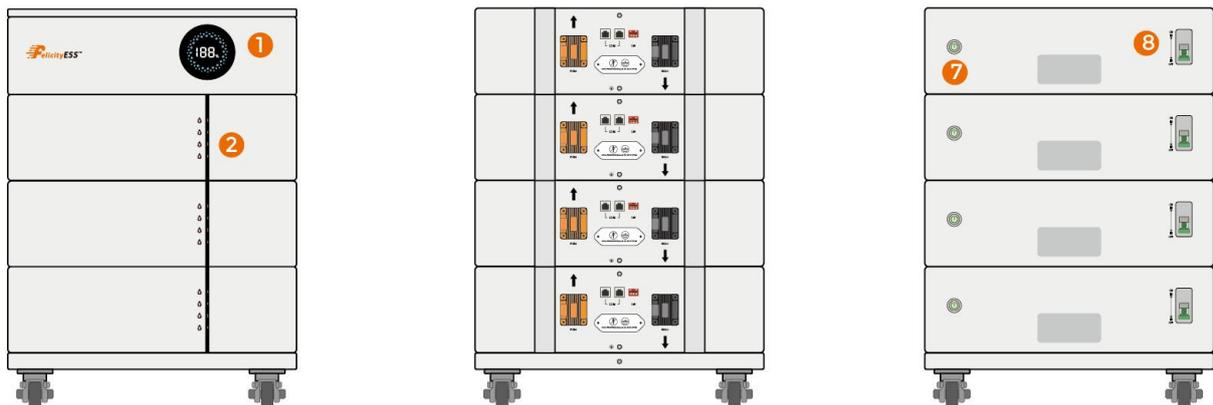
Modular design for easy installation and increased capacity.

Flexible Installation: Wall-Mounted or Floor-Mounted.

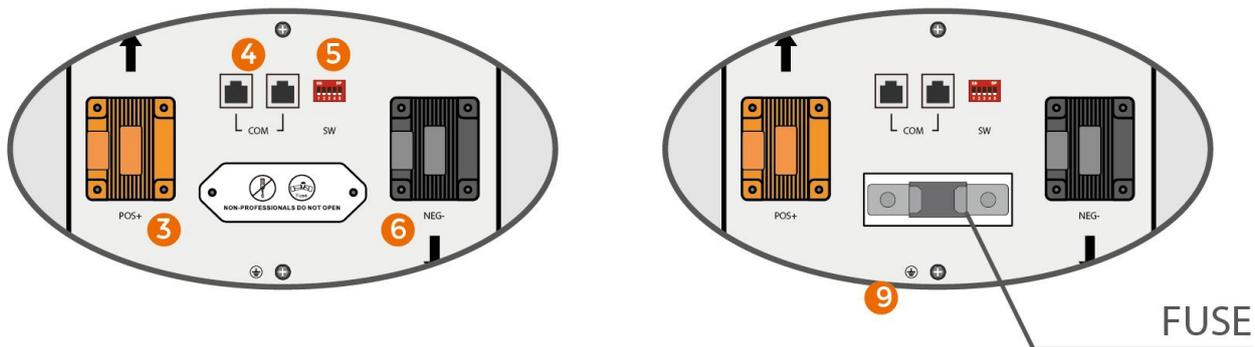
Wide Compatibility: Compatible with leading inverter brands.

High Scalability: Capacity up to 39.84kWh.

Household low-voltage energy storage system



Object	Description	Object	Description
1	LCD Display	6	Battery Negative -
2	LED	7	Power ON/OFF
3	Battery Positive +	8	DC Breaker
4	Communication Port	9	Earth Cable
5	DIP Switch		



NOTE

Fuse(Non professionals are not allowed to open this cover), If the fuse is burnt out, please open the cover and replace it.

Description for LED

100%	75%	50%	25%	Flashing SOC<10%

NOTE

The battery need to be fully charged for at least once in one month to ensure the accurate SOC calculation.

Household low-voltage energy storage system

ON/OFF or SOC Led (Mode or SOC)

BATTERY MODE	ON/OFF		SOC				REMARK
	GREEN LED	RED LED	LED1	LED2	LED3	LED4	
POWER OFF	OFF	OFF	OFF	OFF	OFF	OFF	
POWER ON	OFF	ON	ON	ON	ON	ON	
STANDBY	OFF	OFF	SOC				SOC <10%(DEFAULT): LED1 FLASH
NORMAL	ON	OFF	RUNNING/SOC				SOC <10%(DEFAULT): LED1 FLASH
DISCHARGE	ON	OFF	SOC				SOC <10%(DEFAULT): LED1 FLASH
CHARGE	FLASH	OFF	RUNNING				
LOW POWER	FLASH	OFF	OFF				
FAULT	OFF	ON	ON	OFF	OFF	OFF	BATTERY VOLTAGE HIGH
			OFF	ON	OFF	OFF	BATTERY VOLTAGE LOW
			ON	ON	OFF	OFF	CELL VOLTAGE HIGH
			OFF	OFF	ON	OFF	CELL VOLTAGE LOW
			ON	OFF	ON	OFF	CHARGING;CURRENT HIGH
			OFF	ON	ON	OFF	DISCHARGING CURRENT HGH
			ON	ON	ON	OFF	BMS TEMPERATURE HIGH
			OFF	OFF	OFF	ON	BMS TEMPERATURE LOW
			ON	OFF	OFF	ON	CELL TEMPERATURE HIGH
			OFF	ON	OFF	ON	CELL TEMPERATURE LOW
			ON	ON	OFF	ON	CURRENT SENSOR ABNOMAL

Household low-voltage energy storage system

LCD Display Icon

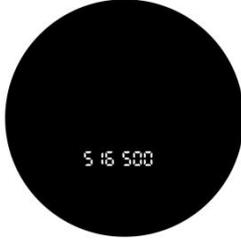
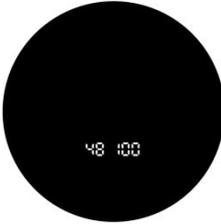
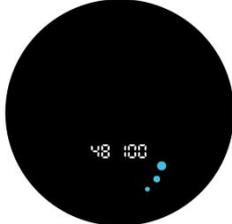
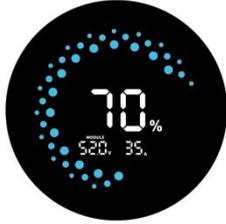


Icon	Function Description
Display Information	
<p>MODULE 888.888 V 888.888 % °F V °C A H</p>	Indicates the voltage,current,temperature,SOC of the module.(Short press the button to display the information of each parallel module.)
<p>100%</p>	Indicates SOC
	Indicates battery level,each LED represents 5%(When charging, this icon flashes; when discharging,the icon displays constant).
	Indicates settings.
	Indicates fault.
	Indicates communication signs.

Household low-voltage energy storage system

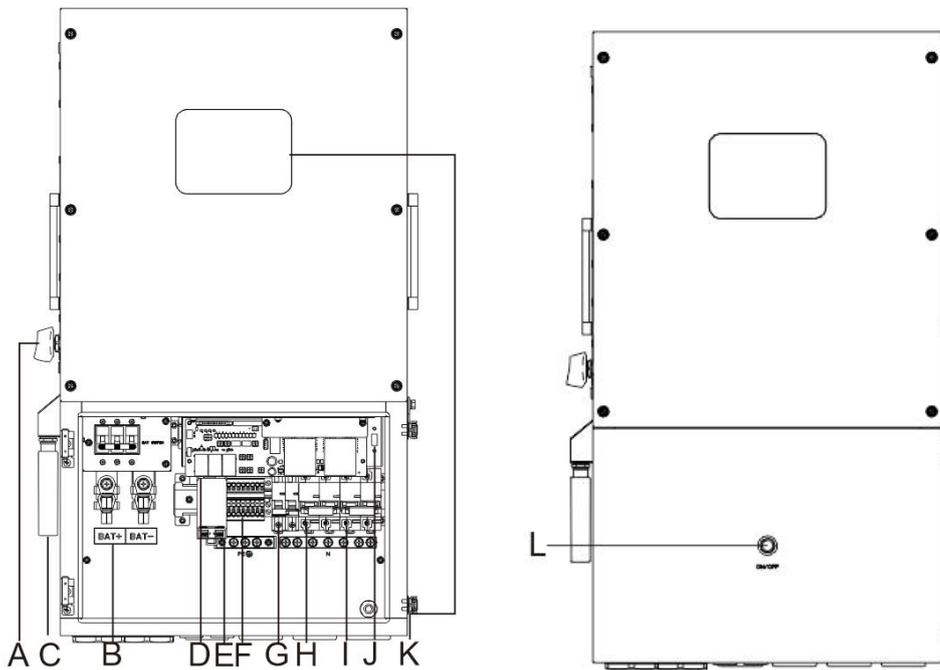
BMS Information Page on the LCD

The basic information will be displayed in turn after power on.

<p>BMS power on information</p> <p>BMS information is all on.</p> 	<p>BMS version</p> <p>Eg: "516" is the software version, "500" is the IAP version and temporary version.</p> 
<p>BMS type</p> <p>Eg: Rated voltage is "48V", model is "100AH".</p> 	<p>BMS data</p> <p>This interface indicates that it is in SOC calibration.</p> 
<p>BMS data</p> <p>Eg: "70%" refer to battery SOC, "C" indicates that the battery is charging, and if it is discharging, "d" is displayed. "2" indicates that the data currently displayed is for module 2, "65%" represents the SOC of module 2. Short press the button to display the information of each parallel module.</p> 	<p>BMS data</p> <p>Eg: "70%" refer to battery SOC, "52.0V" refer to battery voltage, "35A" refer to battery current. Short press the button to display the information of each parallel module.</p> 
<p>BMS fault code /flag</p> <p>Eg: "52.0V"/"C09"/"70%" are battery voltage, fault code and SOC respectively, and Fault icon constant.</p> 	

Household low-voltage energy storage system

3.4.2 Inverter



Object	Description
A	DC switch
B	BAT input
C	Wi-Fi/GPRS
D	CAN1/CAN2/Meter_RS485/BMS_CAN/485/CTL1L2/Type-C upgrade
E	PE
F	PV1~PV4 input
G	Generator
H	Grid output
I	EPS load output
J	Screen firmware USB upgrade port
K	LCD screen
L	RSD (ON/OFF) button

Household low-voltage energy storage system

Port Function

CAN1/CAN2: Communication interface for connecting inverters.

Meter_RS485: Read the inverter data and send it to the screen.

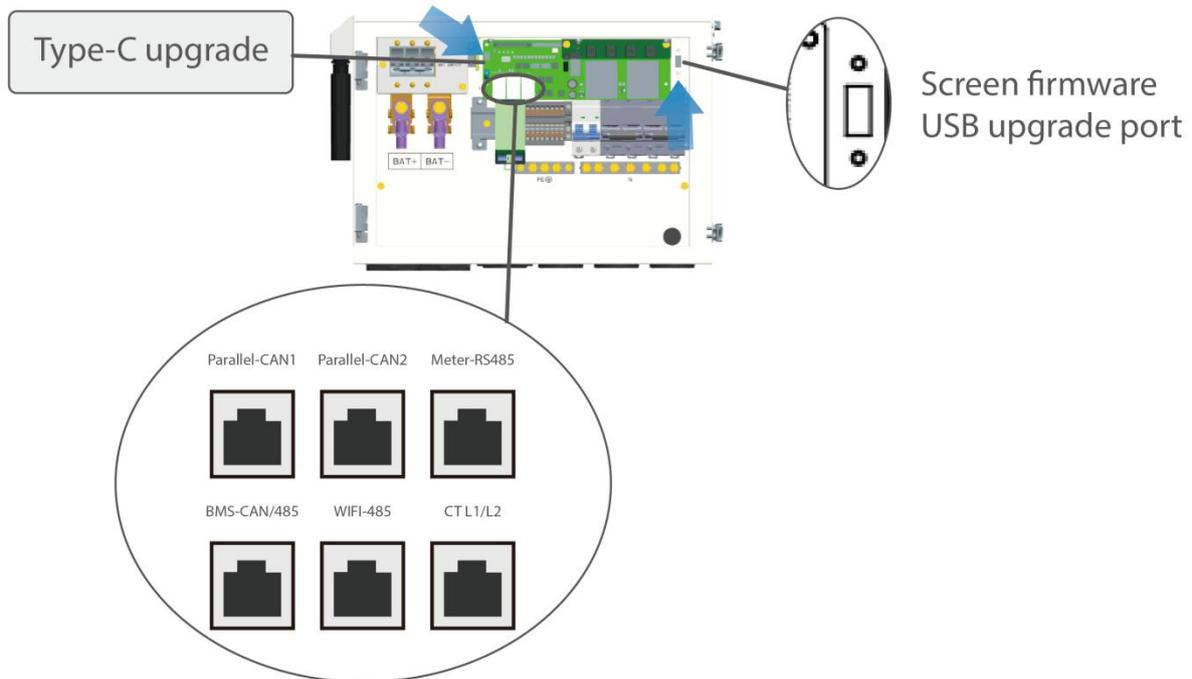
BMS-485/ BMS-CAN: BMS communication for lithium batteries.

Wi-Fi_485: Standby crystal port for the Wi-Fi module.

CT L1/L2: For external grid side CT to detect current size.

TYPE-C UPDATE: Update Inverter software locally on PC via USB-A port.

Screen firmware USB upgrade port: Upgrade the screen firmware using the USB port



DRY1_1B/DRY1_1A: Used to start the Inverter driver. Used to start the Inverter driver. The two have been connected through the circuit, and only one interface needs to be controlled separately.

DRY0_2A and DRY0_2B (dry contact, normally closed): Reserved dry contact port.

DRY0_2A and DRY0_2C (dry contact, normally open): Reserved dry contact port. (mutually exclusive with DRY0_2B and DRY0_2A).

DRY0_1A and DRY0_1B (dry contact, normally open): For generators, dry contact closure, generator start, dry contact disconnection, generator shutdown.

DRY0_1A and DRY0_1C (dry contact, normally closed): mutually exclusive with DRY0_1B and DRY0_1A.

+12V_com/GND com: Used to connect rapid solar shutdown.

IGRID_BN_I/ IGRID_BP_I: CT L2 standby cable port.

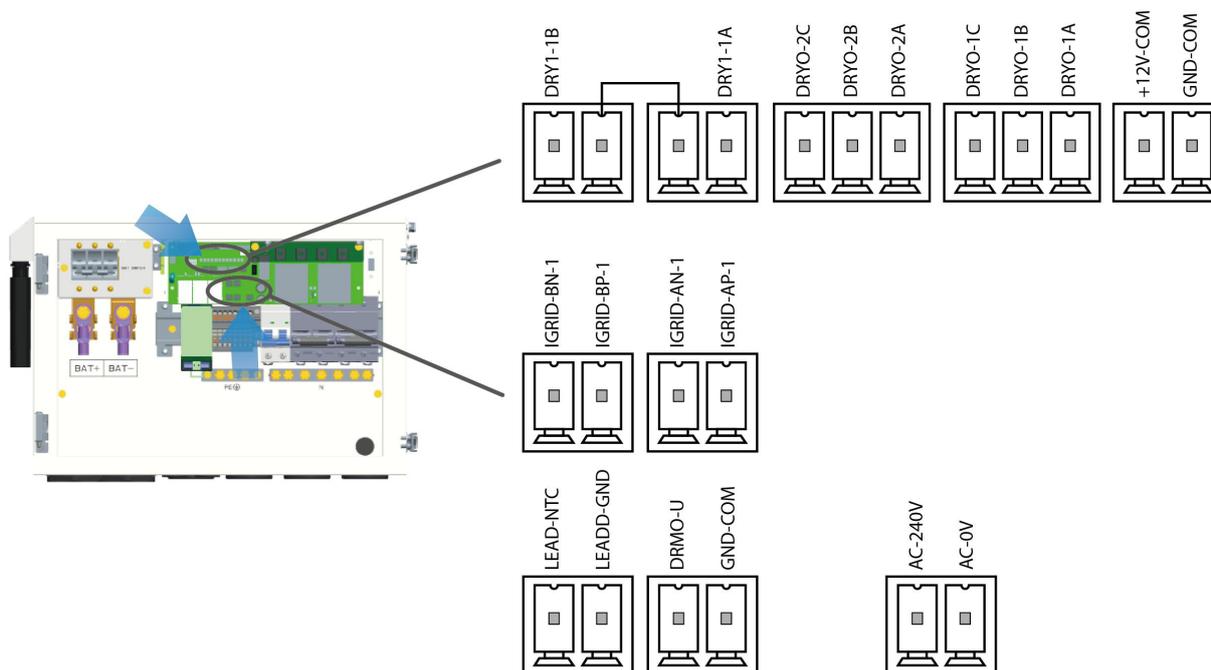
IGRID_AN_I/ IGRID_AP_I: CT L1 standby cable port.

LEAD_NTC/ LEAD_GND: Lead-acid battery temperature sampling input interface.

DRMO_U / GND_COM: Reserved dry contact port.

AC_240V/AV-0V: AC240V isolated output interface.

Household low-voltage energy storage system



WARNING

Qualified electrician will be required for the installation.

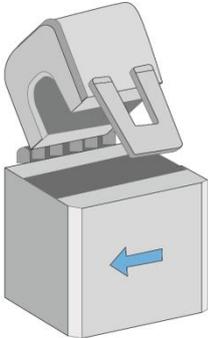
4 Installation Prerequisite

4.1 Packing List

Make sure the products are intact during transportation. If there is any visible damage, such as cracks, please contact your dealer immediately.

Open the package and take out the product, please check the accessories first.

The inverter packing list shown as below.

	 	
<p>Inverter</p>	<p>Expansion screws and pan-head screws, Hanging rack</p>	<p>CT (CTSA016-90A-90mA, inner radius 16mm)</p>

Household low-voltage energy storage system

		
Wi-Fi module (optional)	GPRS module (optional)	User manual

The battery packing list shown as below.

LUX-X-48100LCG01-US			
NO.	DESCRIPTION	QUANTITY	PICTURE
1	The base is used for product placement and plays a supporting role.	1	
2	User manual	1	
3	Warranty card	1	
4	Power Cable 1: 0.9 meters, 35mm ² , allows for charging and discharging up to 150A, used for connecting to external PCS+ (red). Power Cable 2: 2.3 meters, 35mm ² , allows for charging and discharging up to 150A, used for connecting to external PCS- (black).	2	
5	Ground Wire: used for grounding connections between the master and slave controllers.	1	
6	Communication Cable 1: used for CAN/RS485 communication with inverters from other brands.	1	
7	Communication Cable 2: used for RS485 communication with Megafelicity inverters.	1	
8	Hole Marking Cardboard: used to mark drilling positions during product installation. For detailed installation instructions, please refer to the installation steps below.	1	

Household low-voltage energy storage system

9	Hex Wrench: used as a tool for stacking and securing products. For detailed installation instructions, please refer to the installation steps below.	1	
10	OT Terminal: screw hole diameter 10.5mm, wire crimp hole diameter 17mm, used with 150mm ² power cables.	4	
11	Plastic Expansion Screw: used together for product fixation.	4	
12	Screws M5X12*8 PCS Screws M6X16*16 PCS Screws M5X25*2 PCS	/	
13	Casters: used for product support and short-distance transportation.	4	
14	Signal Terminal: used for creating custom communication cables.	2	
15	Fixed trestle:Used for fixing products	4	

LUX-X-48100LMG01-US

NO.	DESCRIPTION	QUANTITY	PICTURE
1	User manual	1	
2	Warranty card	1	
3	Ground Wire: used for grounding connections between stackable battery packs.	1	
4	Plastic expansion screws are used to secure products and walls	2	
5	Screws M5X12*4PCS Screws M5X25*2PCS	/	
6	Parallel Soft Copper Busbar: allows for charging and discharging up to 450A, used for parallel connections between stackable battery packs.	2	

Household low-voltage energy storage system

7	Communication Cable: used for communication connections between stackable battery packs.	1	
8	Fixed trestle: Used for fixing products	2	

4.2 Installation Position

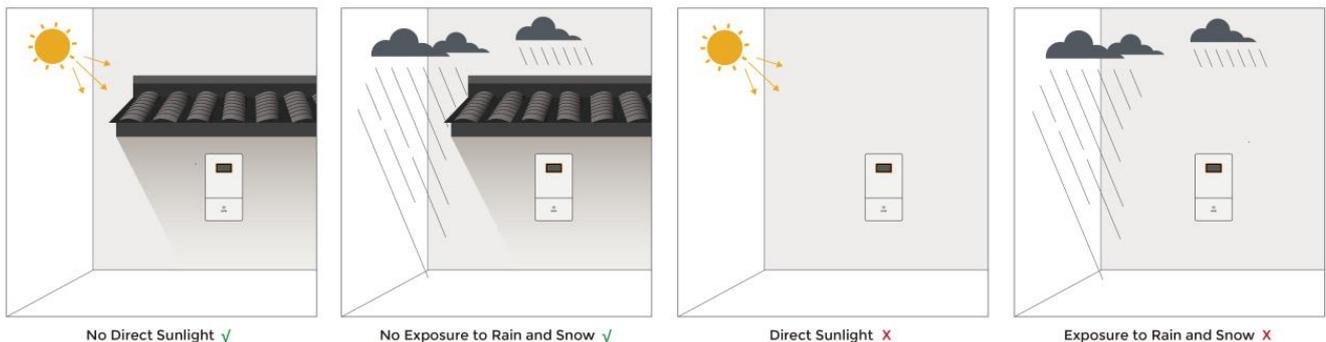
Inverter Installation Position

Inverter is designed for outdoor installation (IP65). Make sure the installation site meets the following conditions:

- Not in direct sunlight.
- Not in areas where highly Flammable materials are stored.
- Not in potential explosive areas.
- Not in the cool air directly.
- Not near the television antenna or antenna cable.
- Not higher than altitude of about 2000m above sea level.
- Not in environment of precipitation or humidity (>95%).
- Under good ventilation condition.
- The ambient temperature in the range of -20°C to +60°C.
- The slope of the wall should be within $\pm 5^\circ$.

The wall hanging the inverter should meet conditions below:

- 1.Solid brick/concrete, or strength equivalent mounting surface;
- 2.Inverter must be supported or strengthened if the wall's strength isn't enough (such as wooden wall, the wall covered by thick layer of decoration) Please AVOIDE direct sunlight, rain exposure, snow laying up during installation and operation.



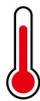
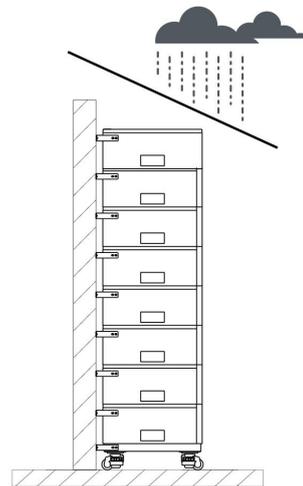
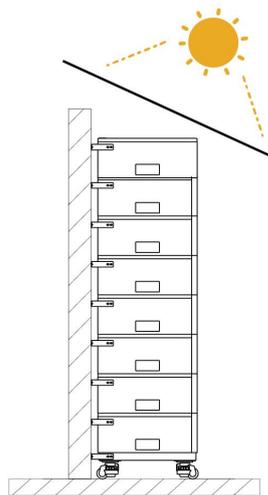
Household low-voltage energy storage system

<i>Position</i>	<i>Min.Size(CM)</i>
Left	30CM
Right	30CM
Top	50CM
Bottom	50CM
Front	100CM

Battery Installation Position

1. The system should be installed in a ventilated & dry place with temperature from 0°C to 50°C (High ambient temperature will reduce the power of the system.).
2. To avoid burning and electric shock, the system should be installed beyond the reach of children.
3. Make sure the installation position does not shake.

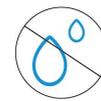
<i>Position</i>	<i>Min.Size(CM)</i>
Left	30CM
Right	30CM
Front	100CM



Max. +55°C



Min. -20°C

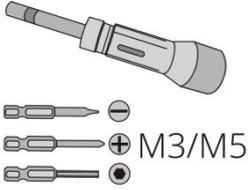
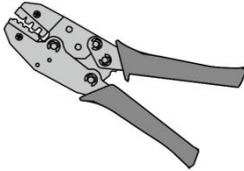
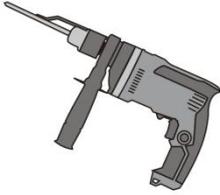
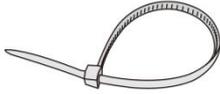


RH. +5%~+95%

4.3 Tools

Household low-voltage energy storage system

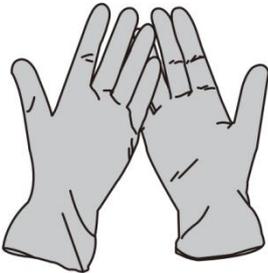
To install the system, the following tools are required:

			
Diagonal Pliers	Torque Wrench	Cable Crimper	Wire Clamp
			
Voltmeter	Heat Gun	Drill	Ruler
			
Heat Shrink Tubing	Rubber Mallet	Rolling Strip	Marking Pen

In order to protect the operator and the installer's safety, please select and use suitable tools and measuring instruments that are certified for precision and accuracy.

4.4 Safety Instruments

When dealing with the battery, the following safety gears should be equipped. Installers must meet the relevant requirements of UL or the domestic legislation and other relevant international standards.

		
Insulated glove	Safety goggles	Safety shoes

Household low-voltage energy storage system

4.5 Storage

If the system is not to be installed immediately, or removed from operation and needs to be stored for a long period, please choose an appropriate location to store it. Instructions for storage are:

- The temperature of the system stored is recommended in the range of -4F(-20°C) to 113F(45°C).
- Do not expose the system to water.
- The products box should be upright and not stacked upside down when storing the battery box.
- If the battery needs to be stored for over 3 months, the main breaker of the battery is suggested to be disconnected. Otherwise, the battery would discharge at a minimum rate and its capacity will reduce depending on storage time, the battery self-consumption will be less than 5W.
- If the battery will be stored for over 6 months, it is suggested to connect the battery with an inverter and commissioning the system.

5 Installation

5.1 Inverter Mounting

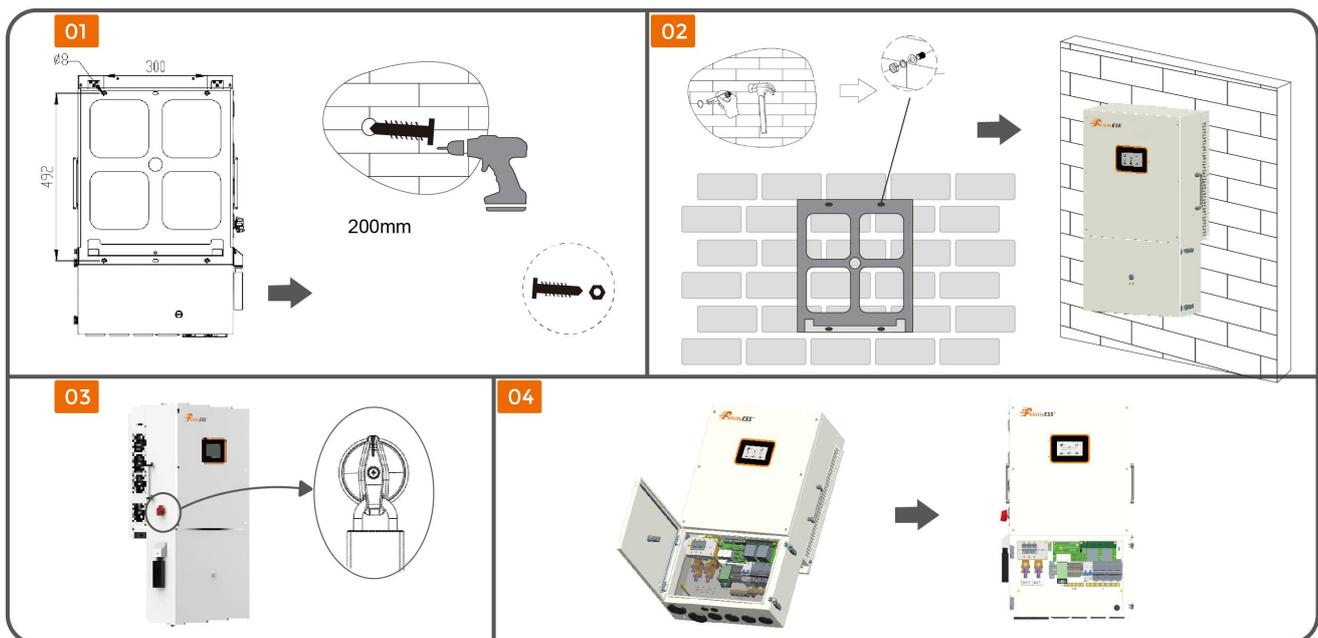
Step 1: Drill 4 holes in the wall according to the following distance dimensions, 200mm depth. Then use a proper hammer to fit the expansion bolt into the holes.

Step 2: Attach the Hanging rack to the wall using 4 expansion screws. Lift the inverter, place the inverter on the Hanging rack, and tighten the screws on both sides of the lower part.

Step 3: Install an anti-theft lock on DC switch of the inverter.

Step 4: The two latches on the lower right of the inverter open upward to open the waterproof cover. If you need to remove the display panel on the top half of the machine, use a hexagonal screwdriver to remove the six screws on the top. Wiring box conduit plugs, Conduit plugs are provided for 1inch conduit fittings. If used conduit fitting is not 1 inch, an appropriate conduit adaptor should be used.

Step 5: Pass the corresponding conduit and fasten the joint.



Household low-voltage energy storage system

5.2 Battery Mounting

Step 1: Open the packaging Carton box and remove the accessories(LUX-X-48100LCG01-US battery pack.base,wheel*4PCS);

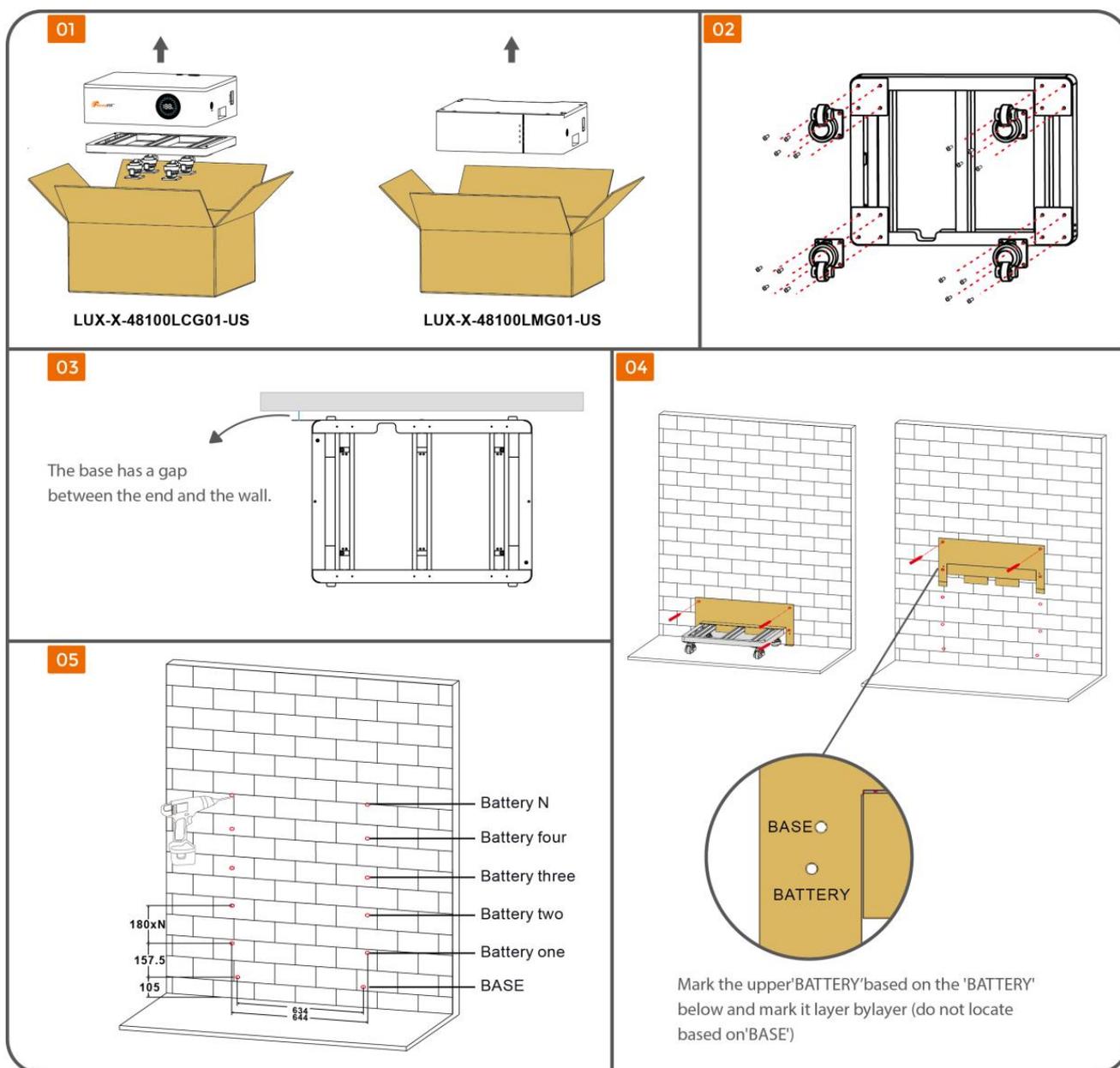
Step 2:Open the packaging Carton box and remove the accessories(LUX-X-48100LMG01-US battery pack).

Step 3: Fix the 4 casters on the base using M6X16 screws.

Step 4: Place the base, which should be 35MM away from the wall.

Step5: Use wall mounted positioning cardboard, and mark the holes layer by layer.

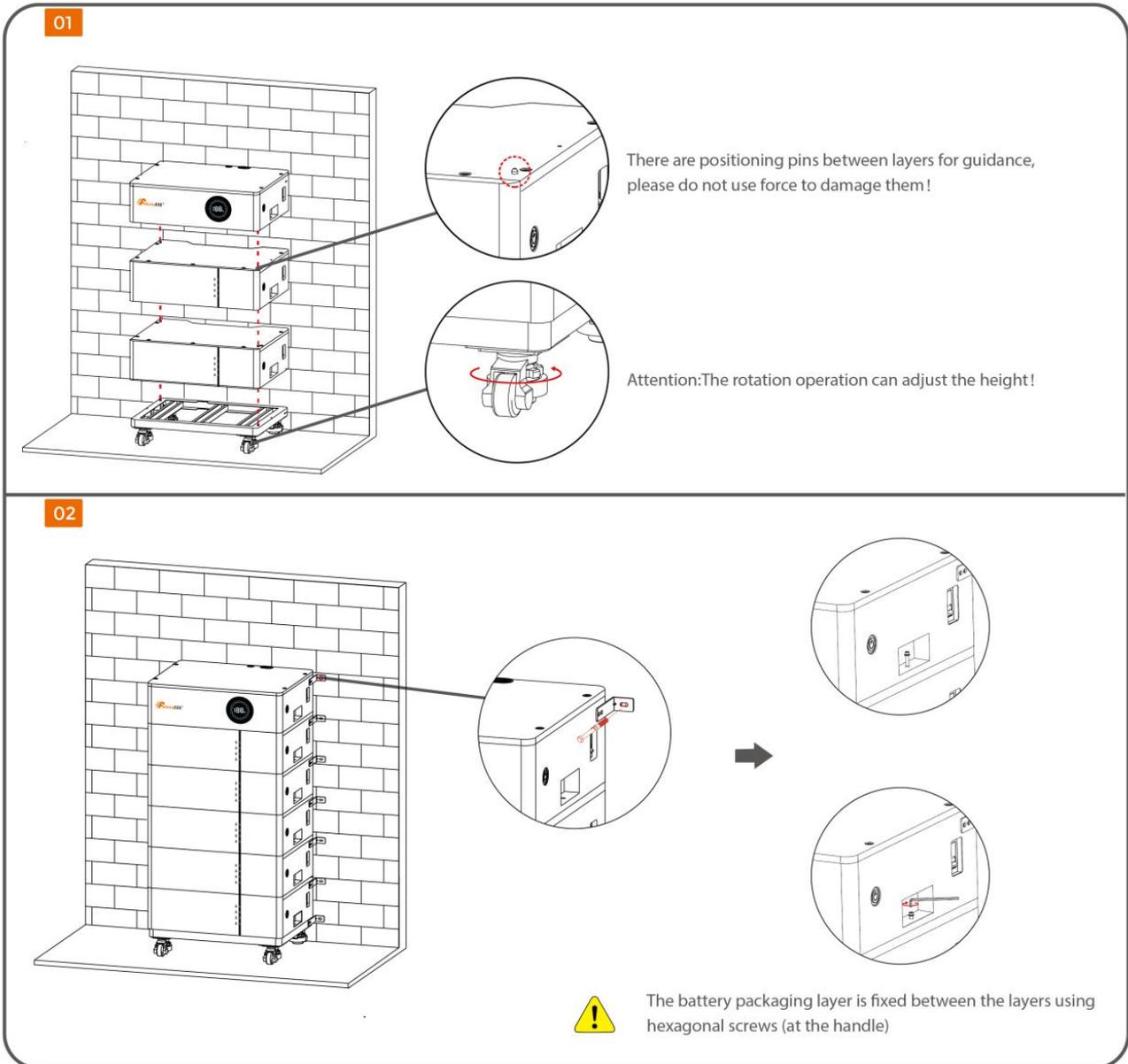
Step 6: Drill holes according to the position marked on the installation hole position cardboard (note: the hole diameter is 10mm, and the drilling depth is 60mm).



Household low-voltage energy storage system

Step 7: Stack and place the products with a base on the bottom layer, LED lights on the middle layer and an LCD display screen on the top layer.

Step 8: Use sheet metal lock wall components to fix the product on the wall.

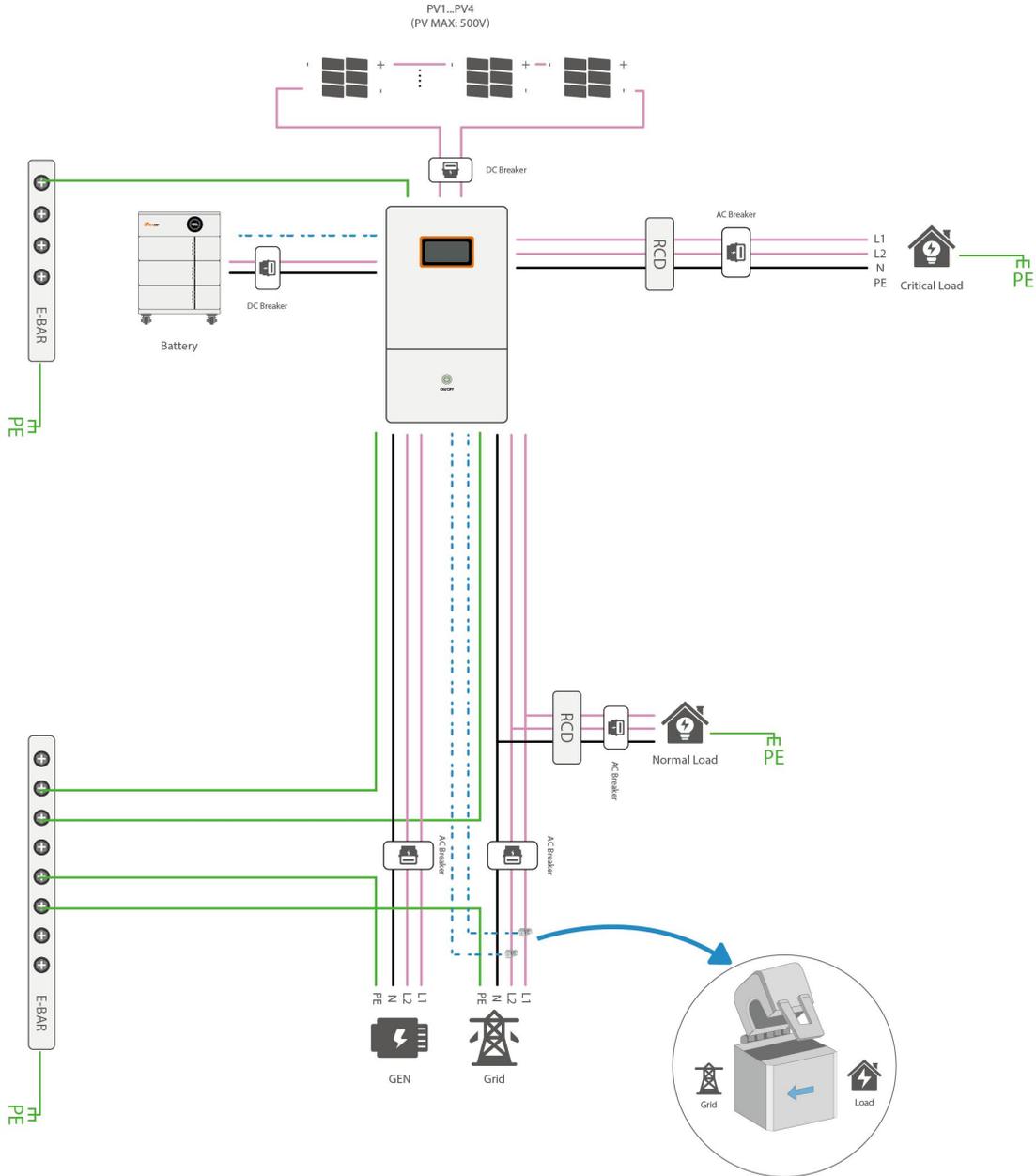


Household low-voltage energy storage system

5.3 Electrical Connection

5.3.1 Megafelicity ESS Series Wiring Diagram

General wiring diagram of system.



 All switches and RCD devices in the figure are for reference only, and the specific installation shall be subject to local regulations!

NOTE
The arrow on the CT points to the power grid, showing as above. If the CT connector is improperly connected, the inverter cannot read the data correctly, so that the relevant working conditions cannot be realized normally.

Household low-voltage energy storage system

6 Cable Connection

6.1 PV Connection

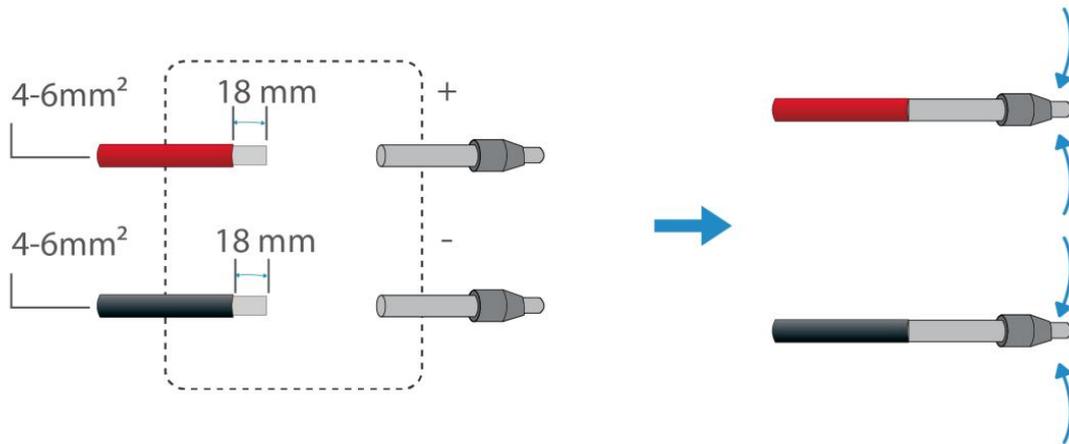
Hybrid can be connected in series with 4-strings PV modules for inverter. Select PV modules with excellent function and reliable quality.

Open-circuit voltage of PV connected in series should be less than Max. DC input voltage; operating voltage should be conformed to MPPT voltage range.

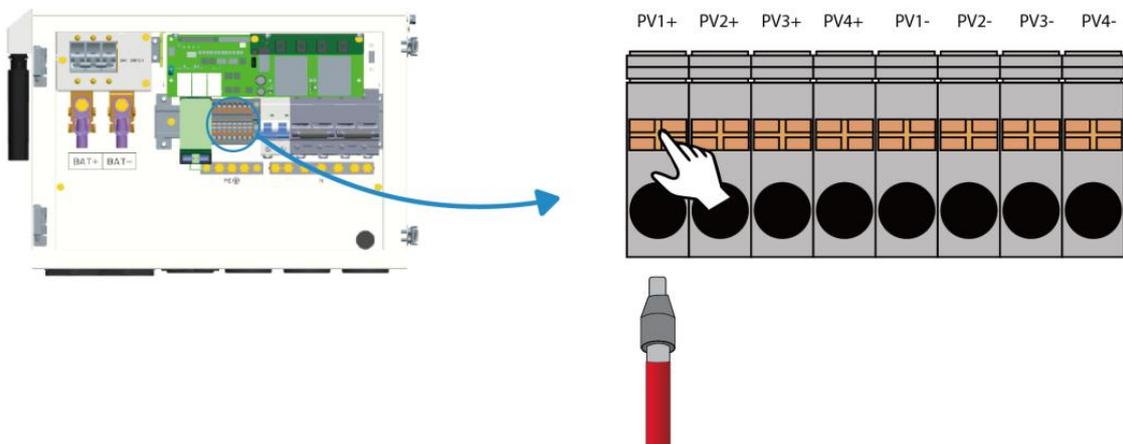
Before connecting PV panels/strings to the inverter, please make sure:

1. Use the right PV connectors in the accessory box.
2. The voltage, current, and power ratings of the PV strings are within the allowable range of the inverter. Please refer to the Technical Data Sheet for voltage and current limits
3. Make sure the PV switch of the inverter is in the "OFF" position during wiring.
4. PV strings could not connect to the EARTH conductor.

Step1: Choose the 12 AWG wire to connect with the cold-pressed terminal. Remove 18mm of insulation from the end of wire.



Step2: Press the button and cross the PV cables through the PV port, Connect PV cables to PV terminals. Release the button, and the cable will be locked in.



Household low-voltage energy storage system

6.2 Grid Connection

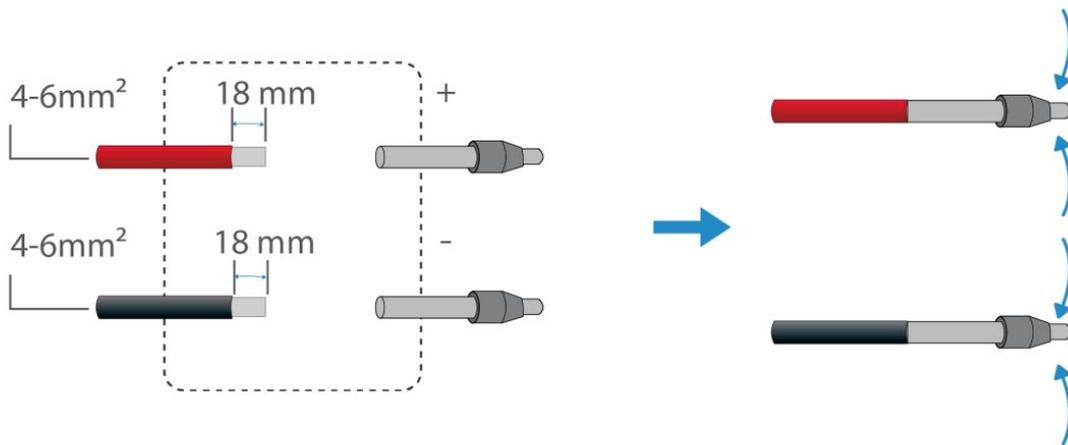
Step1: Check the grid voltage.

1. Check the grid voltage and compare with the permissive voltage range (Please refer to technical data).
2. Disconnect the AC breaker from all the phases.

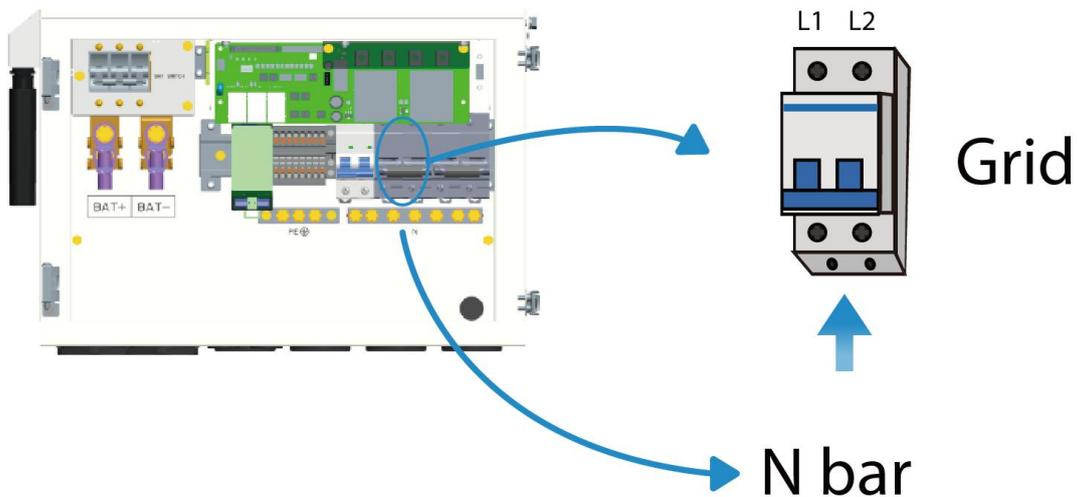
Step2: Grid cables selection

Use the right pin terminal from the accessory box. Press the connectors on cable conductor core tightly.(Remove 18mm of insulation from the end of wire.)

Model	V-SKY-R5KLNA-US	V-SKY-R6KLNA-US	V-SKY-R7K6LNA-US	V-SKY-R8KLNA-US	V-SKY-R10KLNA-US
Cable	12AWG		10AWG		8AWG



Step3: Cross the Grid cables through the grid port, Connect cables to Grid terminals.



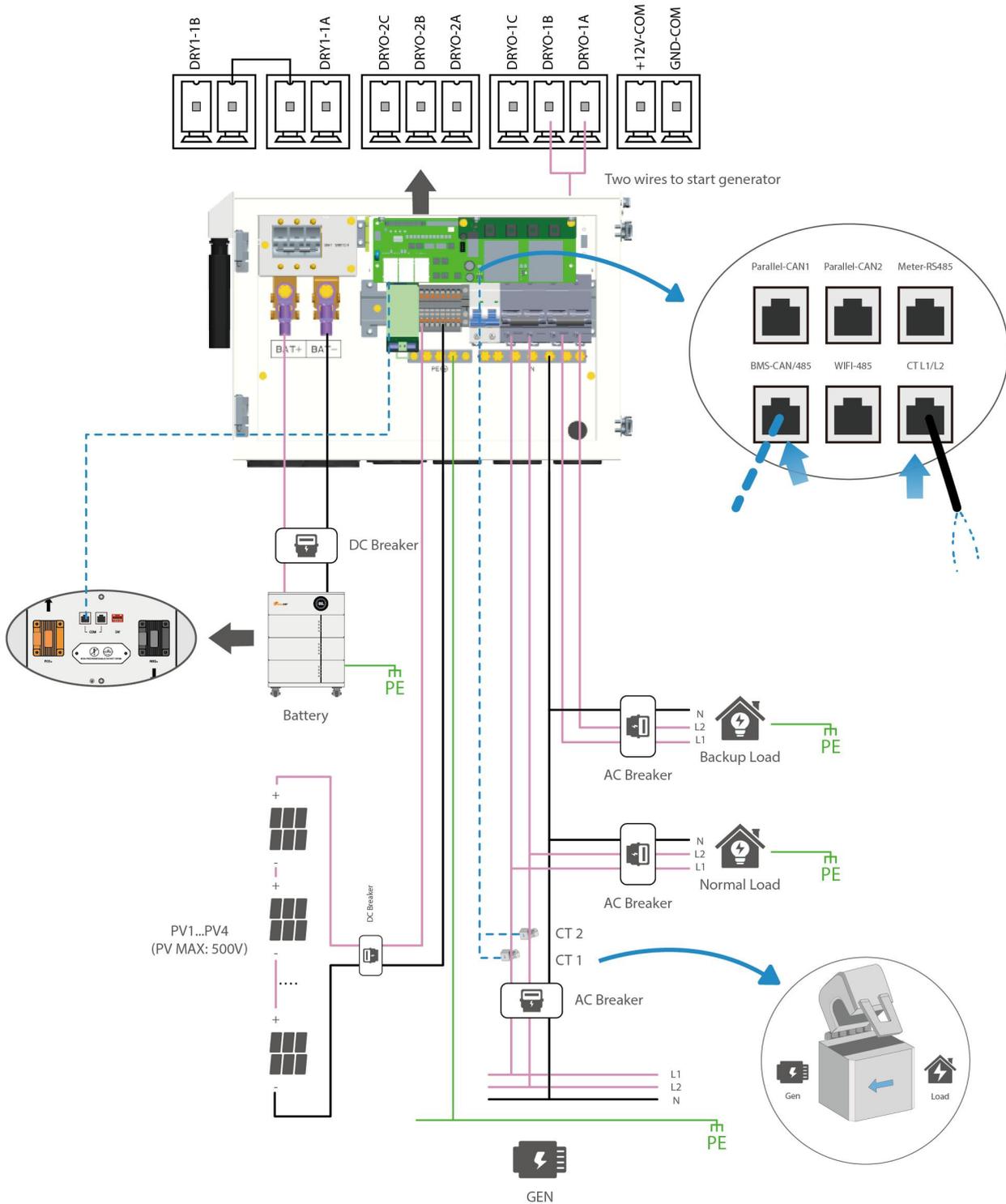
Household low-voltage energy storage system

6.3 Gen Connection

There are two applications for gen connection:

1. Off grid Megafelicity ESS series

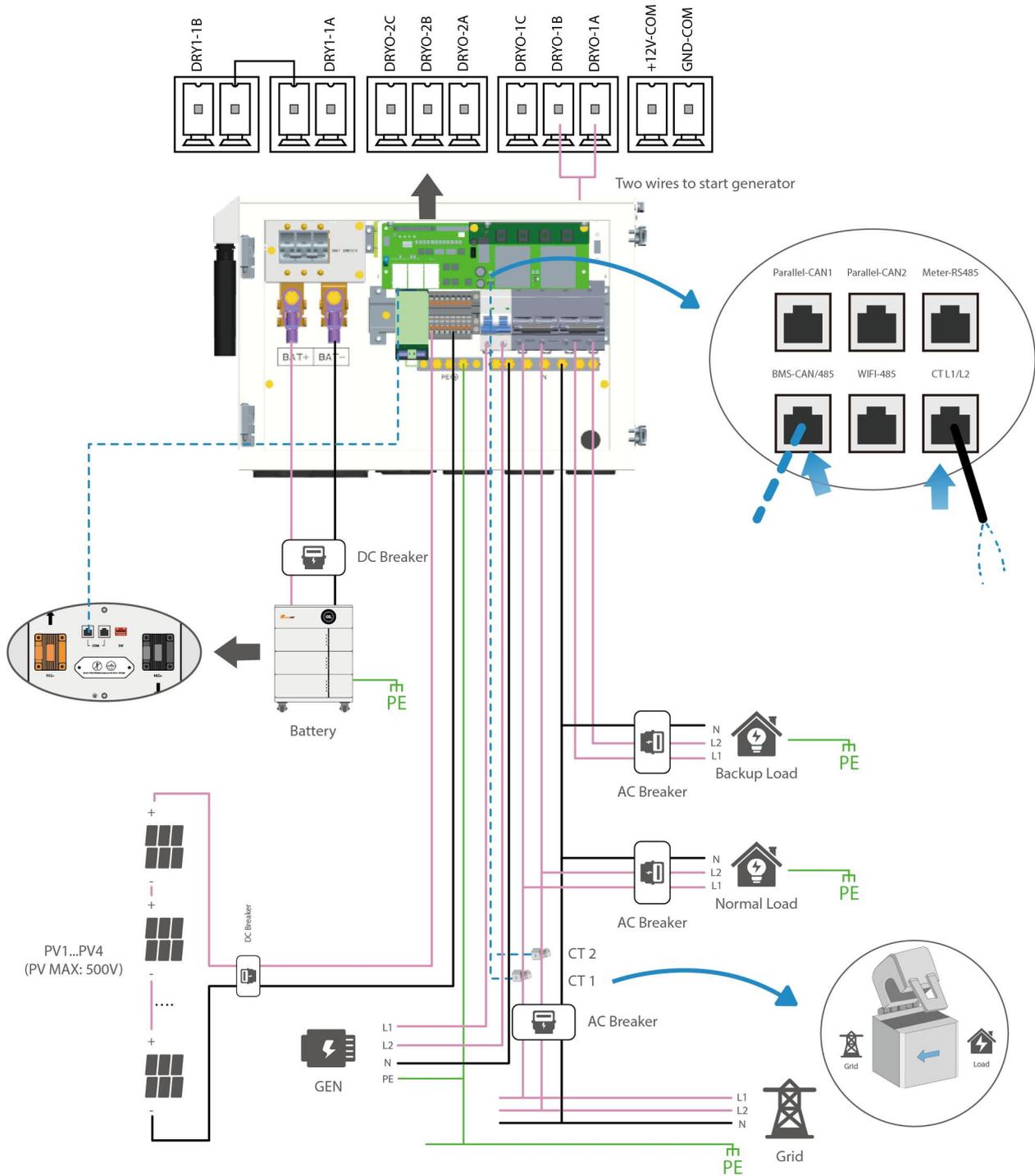
The generator is connected to the grid port of the inverter. The connecting cable shall be covered with CT. The system diagram is showing as follows.



Household low-voltage energy storage system

2. On grid Megafelicity ESS series

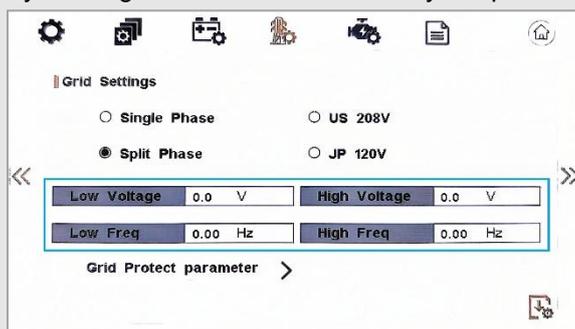
The Generator is normally connected to the Generator port.



Household low-voltage energy storage system

NOTE

1. The two wires start signal DRYO_1A and DRYO_1B of the Generator is used to automatically control the start and stop of the Generator.
2. Don't forget to set the settings in APP to enable this function.
3. When the generator is used in inverter parallel situation, the two wires start signal is only needed to be connected to the master unit. The wiring and the setting of the Generator should be exactly same.
4. The generator provides two modes (automatic and manual) for control, please select one mode to use, do not set both at the same time.
5. The input voltage and frequency of the generator are controlled by the protection parameters of this page.



6.4 Back-up: Load Connection

Inverter has On and Off grid function, the inverter will deliver output power through AC port when the grid is on, and it will deliver output power through back-up port when the grid is off.

Load port: important load.

- 1). For inverter, the standard PV installation typically consists of the connecting the inverter with both panels and batteries. In the event that batteries aren't connected into the system, it's strongly advised against using the system as a back-up. If the system is used as a back-up as mentioned here, Damages will not be covered under the standard warranty and the manufacture will not be liable for consequences arising as result of the user not following this instruction.
- 2). Hybrid inverters are able to supply overload output as its "Back-Up". For details, please refer to the technical parameters of inverter. And the inverter has self-protection dreading at high ambient temperature.
- 3). For complicated application, or Special load, please contact after-sales team.

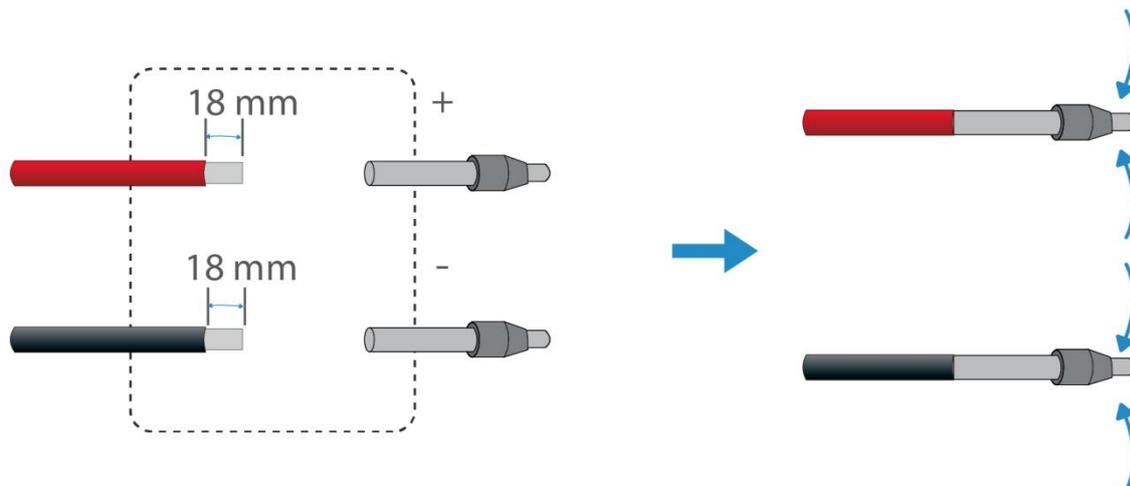
NOTE

In case of discrepancies between wiring mode of local policy and the operation guide above, especially for the wiring of neutral line,grounding and RCD, please contact us before any operation!

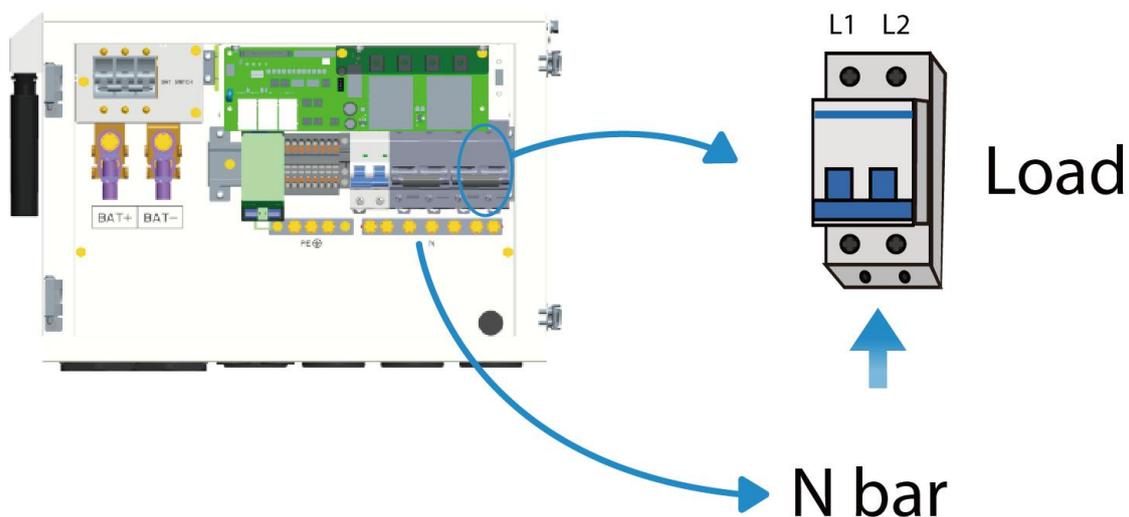
Step1: Make BACK-UP wires.

Model	V-SKY-R5KLNA-US	V-SKY-R6KLNA-US	V-SKY-R7K6LNA-US	V-SKY-R8KLNA-US	V-SKY-R10KLNA-US
Cable	12AWG		10AWG		8AWG

Household low-voltage energy storage system



Step2: Connect the cables to the BACK-UP port of the inverter.



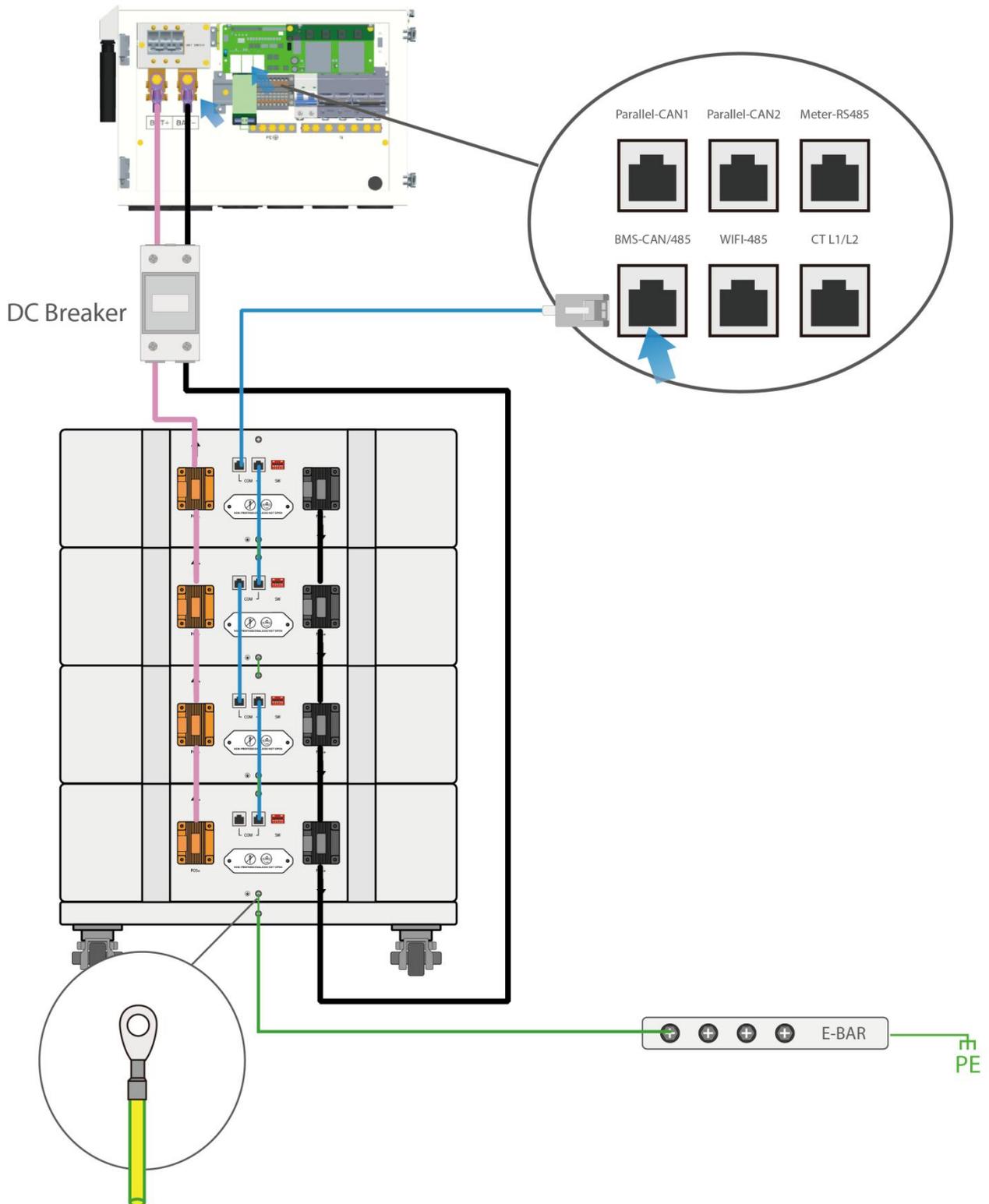
WARNING

- Make sure the BACK-UP load power rating is within BACK-UP output rating, otherwise the inverter will shut down with an “over load” warning.
- When an “over load” is appeared, adjust the load power to make sure it is within the BACK-UP output power range, then return the inverter.
- For the nonlinear load, please make sure the inrush power should be within the BACK-UP output power range.

Household low-voltage energy storage system

6.5 Battery Connection

Battery Wiring Diagram



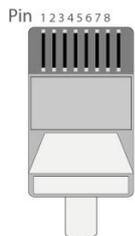
Household low-voltage energy storage system

Battery breaker

A 250 A non-polarized DC circuit breaker has been installed at the positive battery connection end of the inverter to ensure that the inverter can be safely disconnected for maintenance. If you need to add a DC breaker at the negative terminal, add it yourself.

Model	V-SKY-R5KLNA-US	V-SKY-R6KLNA-US	V-SKY-R7K6LNA-US	V-SKY-R8KLNA-US	V-SKY-R10KLNA-US
Current[A]	160A			250A	

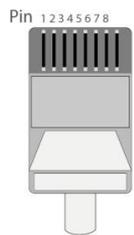
BMS PIN Definition on inverter side



PIN	1	2	3	4
Function Description	/	/	/	BMS_CANH

PIN	5	6	7	8
Function Description	BMS_CANL	GND	BMS_485A	BMS_485B

BMS PIN Definition on battery side

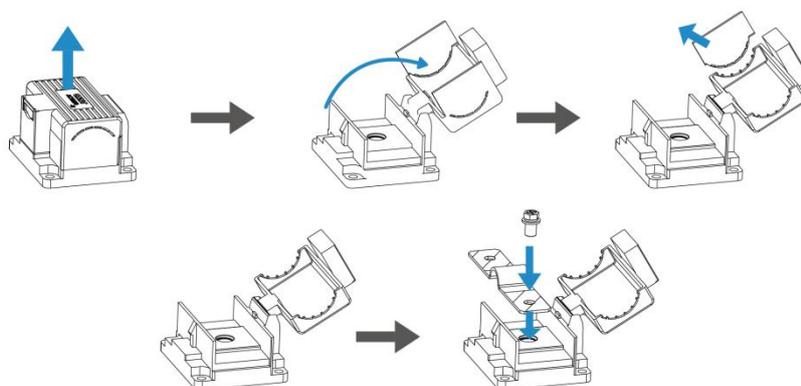


PIN	1	2	3	4
Function Description	Trigger-GND	Trigger-VCC	PCS_CANL	PCS_CANH

PIN	5	6	7	8
Function Description	485B	485A	CANL	CANH

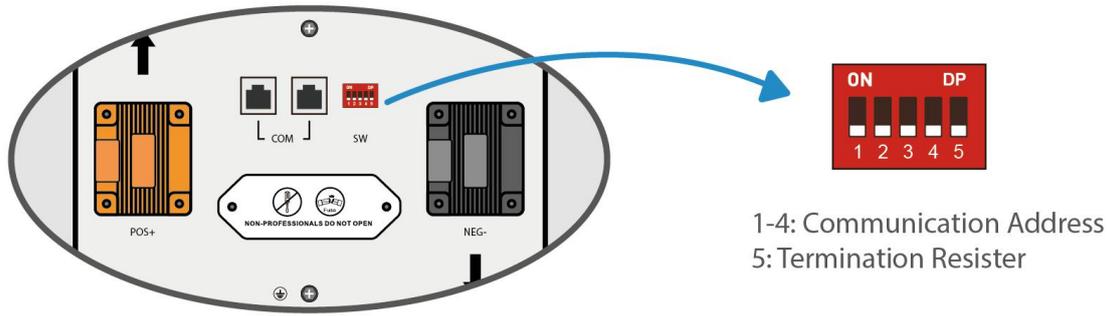
Battery connection

Step1: Please open the lid latch upwards, rotate the lid and tear off the lid cover. Use screws to connect the copper bar, with the positive pole connected from bottom to top and the negative pole connected from top to bottom.



Household low-voltage energy storage system

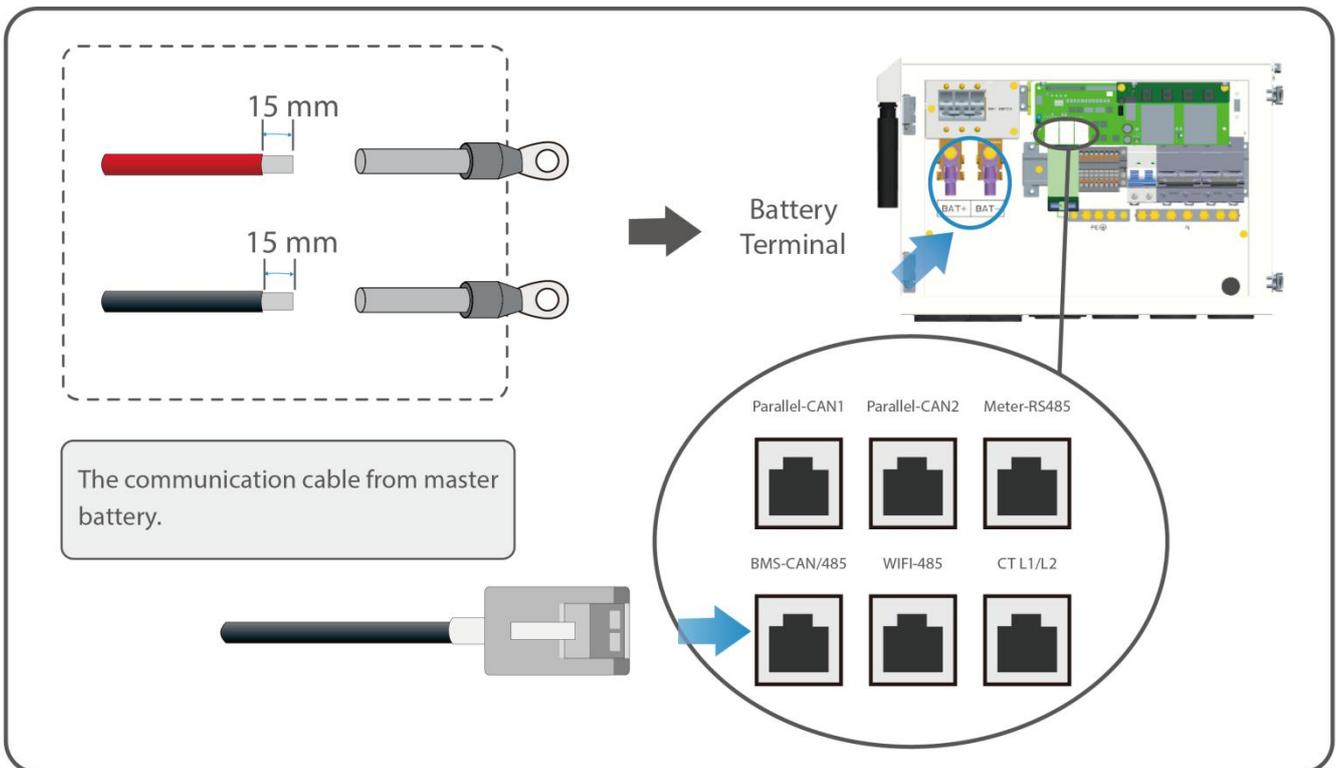
DIP Switch on Battery



No. of BAT	1	2	3	4	5	6	7	8
1PCS	1,5 ON							
2PCS	1,5 ON	2,5 ON						
3PCS	1,5 ON	2 ON	1,2,5ON					
4PCS	1,5 ON	2 ON	1,2 ON	3,5 ON				
5PCS	1,5 ON	2 ON	1,2 ON	3 ON	1,3,5 ON			
6PCS	1,5 ON	2 ON	1,2 ON	3 ON	1,3 ON	2,3,5 ON		
7PCS	1,5 ON	2 ON	1,2 ON	3 ON	1,3 ON	2,3 ON	1,2,3,5 ON	
8PCS	1,5 ON	2 ON	1,2 ON	3 ON	1,3 ON	2,3 ON	1,2,3 ON	4,5 ON

Step3: Choose the 1 AWG wire and strip 15mm off the cable. Select two O-terminals with an aperture of M8. Insert the stripping line into the O-terminal and clamp it with a crimping clamp.

Step4: Insert the battery cable through the battery port. Connect the battery cable to the correct battery terminal.



Household low-voltage energy storage system

WARNING

Positive and negative wires are not allowed to reverse.

6.6 Wi-Fi Connection (Optional)

Inverter provides a Wi-Fi port which can collect data from inverter and transmit it to monitoring-website by Wi-Fi.
(Purchase the product from supplier if needed)

1. Diagram



2. Wi-Fi Connection:

Step1: Plug Wi-Fi into “Wi-Fi” port at the bottom of the inverter.

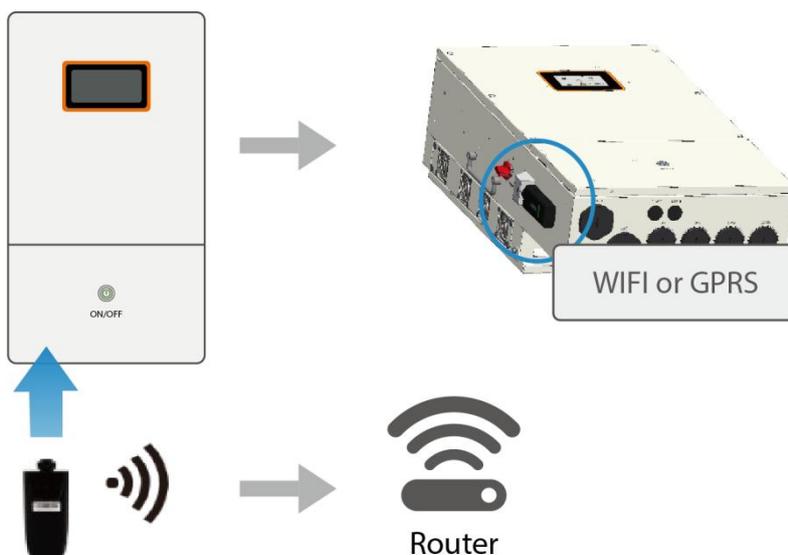
Step2: Build the connection between the inverter and router.

Step3: Create a user account online. (Please check the Wi-Fi user manual for more details).

6.7 GPRS Connection (Optional)

Inverter provides a GPRS port which can collect data from inverter and transmit it to monitoring-website by GPRS.
(Purchase the product from supplier if needed)

1. Diagram



2. GPRS Connection:

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

Household low-voltage energy storage system

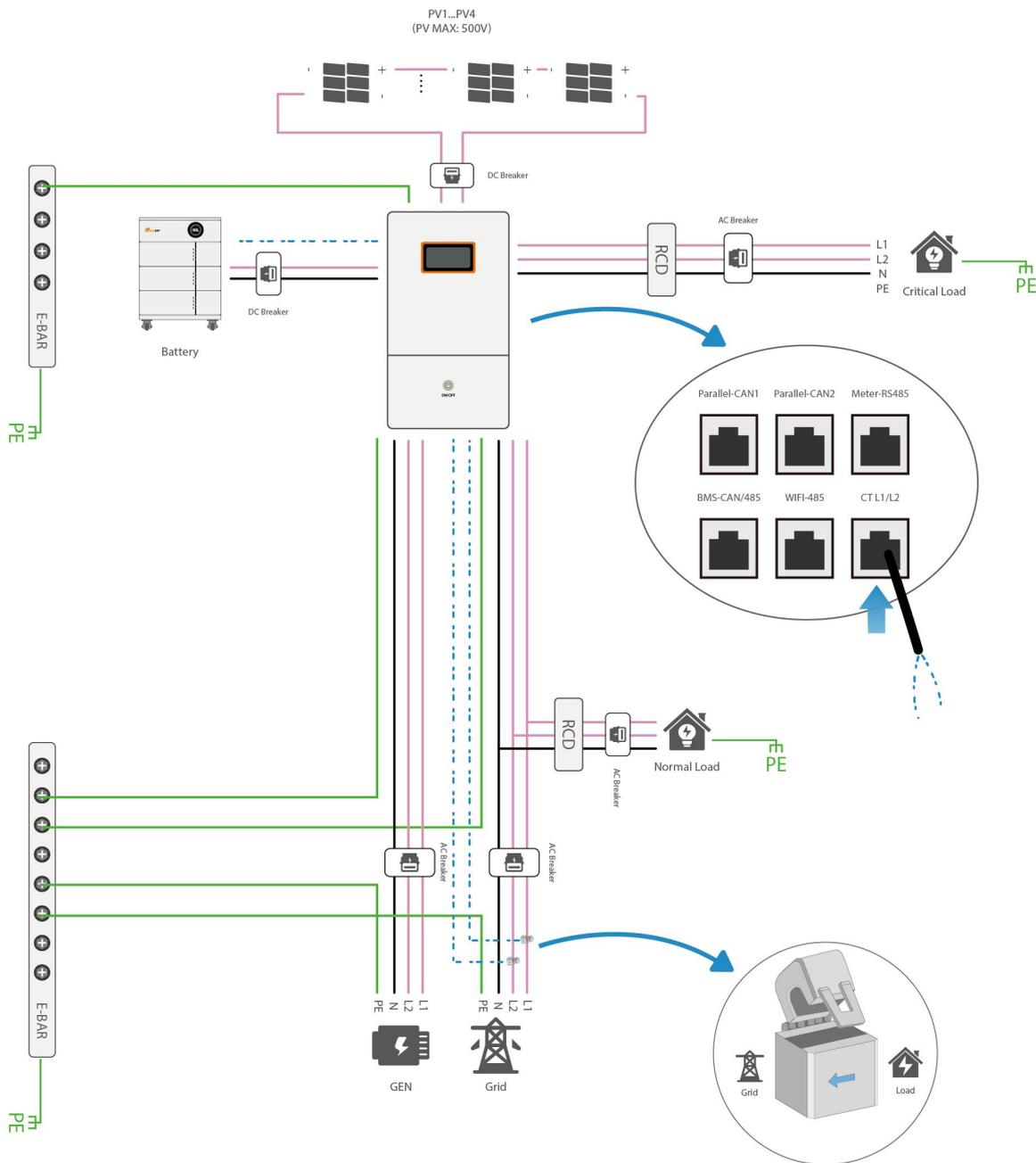
6.8 CT Installation

CT is short for “current transform”, it’s used to detect Grid current. The hybrid inverter provides the CTSA016-90A-90mA CT device by default, which has a 1000:1 sampling ratio.

If the customer uses a third-party CT device, please ensure that the device meets the UL2808 standard.

When connected to single-phase power grid (Europe, Africa, Asia, Australia). Only one CT is provided in the accessories. The RJ45 connector of CT is connected to “CT-L1”, and the CT is connected to L phase. The arrow direction of CT points to the power grid.

When connected to split phase power grid (North America), the accessories provide two CTS, “CT-L1” network interface is connected to L1 phase, and “CT-L2” network interface is connected to L2 phase. The arrow direction of CT points to the power grid.



Household low-voltage energy storage system

NOTE

If CT is not installed or installed reversely, the functions of "Anti-reflux", "Self-use", "Peak-shift" will not be realized. The direction of the arrow on the CT points from this inverter to the GRID!

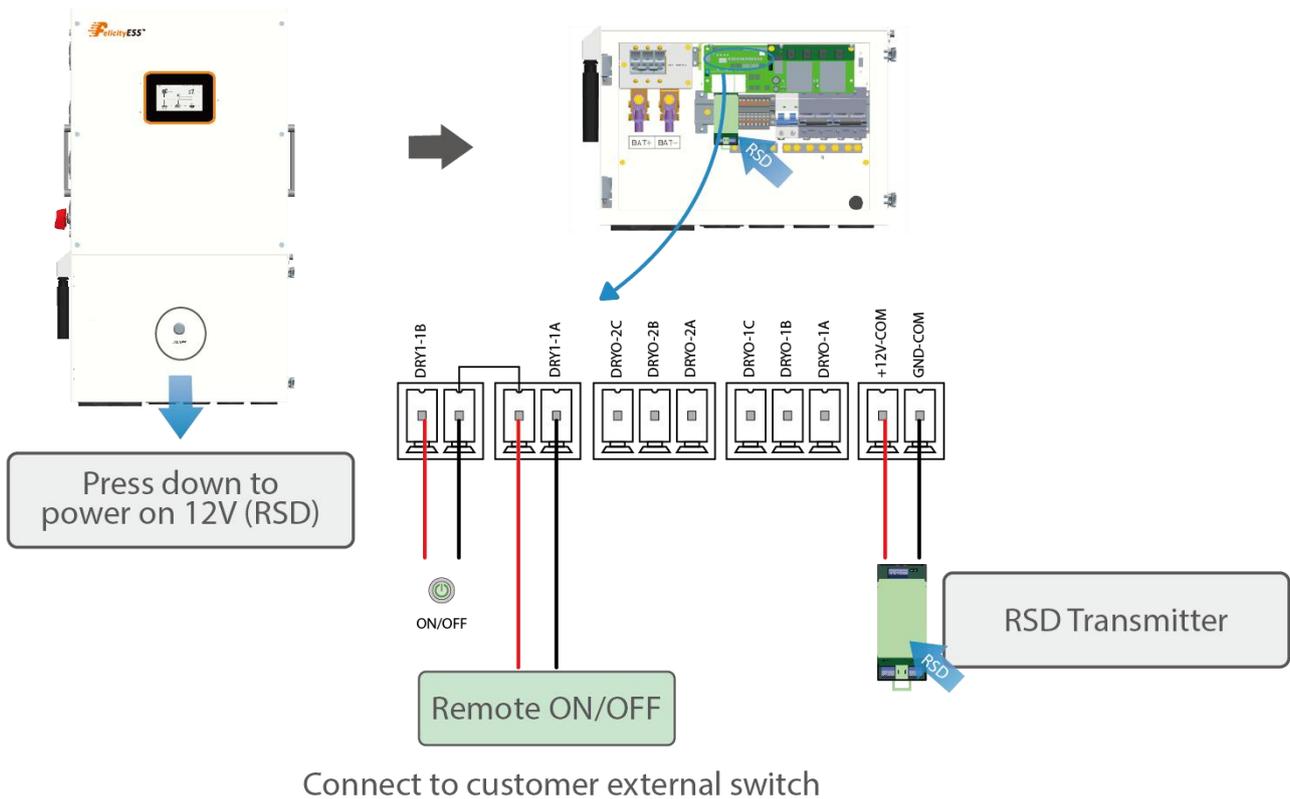
6.9 RSD(ON/OFF) Installation

RSD function and ON/OFF function are the same button.

ON/OFF: The button is connected to dry contacts "DRY1_1B" and "DRY1_1A" through two terminals, if the two terminals are both shorted, the inverter will power on. In addition, the inverter reserves a remote power off terminals. The contact has been shorted before delivery. If necessary, customers can connect a external switch to control the inverter ON and OFF.

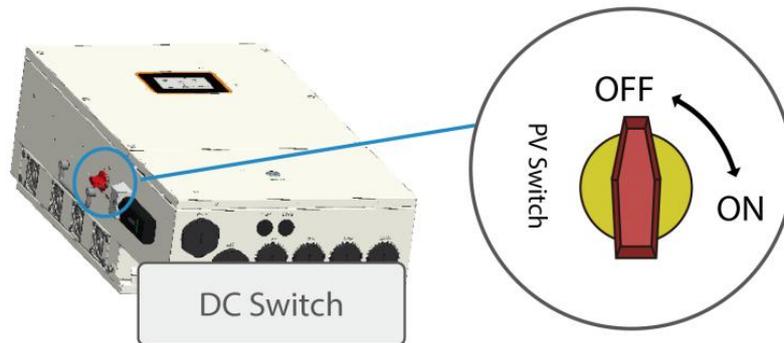
RSD: short for "rapid shutdown". PV system circuits installed on or in buildings include a rapid shutdown function to reduce shock hazard for emergency responders.

Press up this button to power off the 12V ("12V_COM") which is for the "RSD Transmitter", the "RSD Transmitter" is power off ,then all PV modules will shutdown.



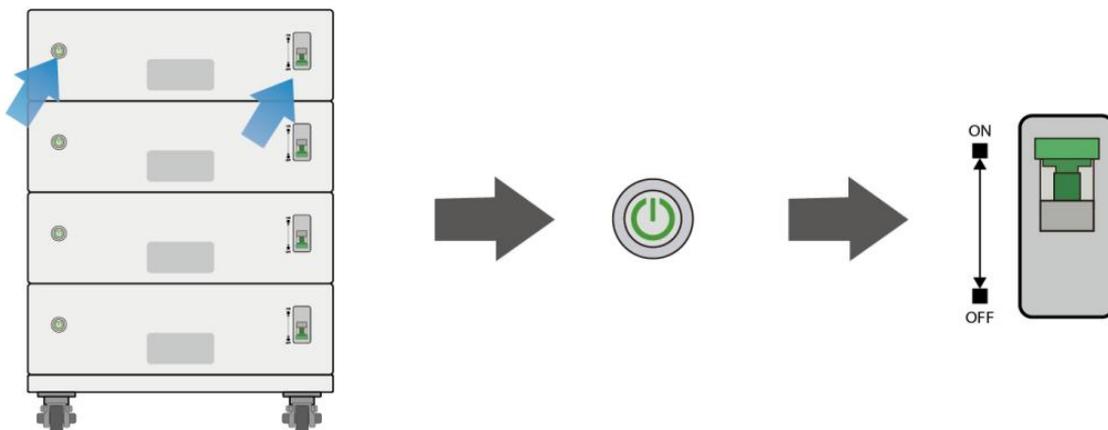
Household low-voltage energy storage system

DC switch: PV input switch.



7 Startup Procedure

Step 1: Turn on the battery breaker and press the battery power button one by one.



Step 2: Turn on the PV switch.

Step 3: Turn on the grid breaker.

Step 4: If the generator is applied, turn on the gen breaker.

Step 5: If the back-up load is applied, turn on the backup breaker.

Step 6: Press the power Button of inverter.

Step 7: Configure the WIFI stick.

8 Shutdown Procedure

Step 1: If the backup load is applied, turn off the backup load first and then turn off the backup breaker.

Step 2: Turn off the grid breaker.

Step 3: If the generator is applied, turn off the gen breaker.

Step 4: Turn off the PV switch.

Step 5: Open the battery breaker covers and turn off the battery breakers.

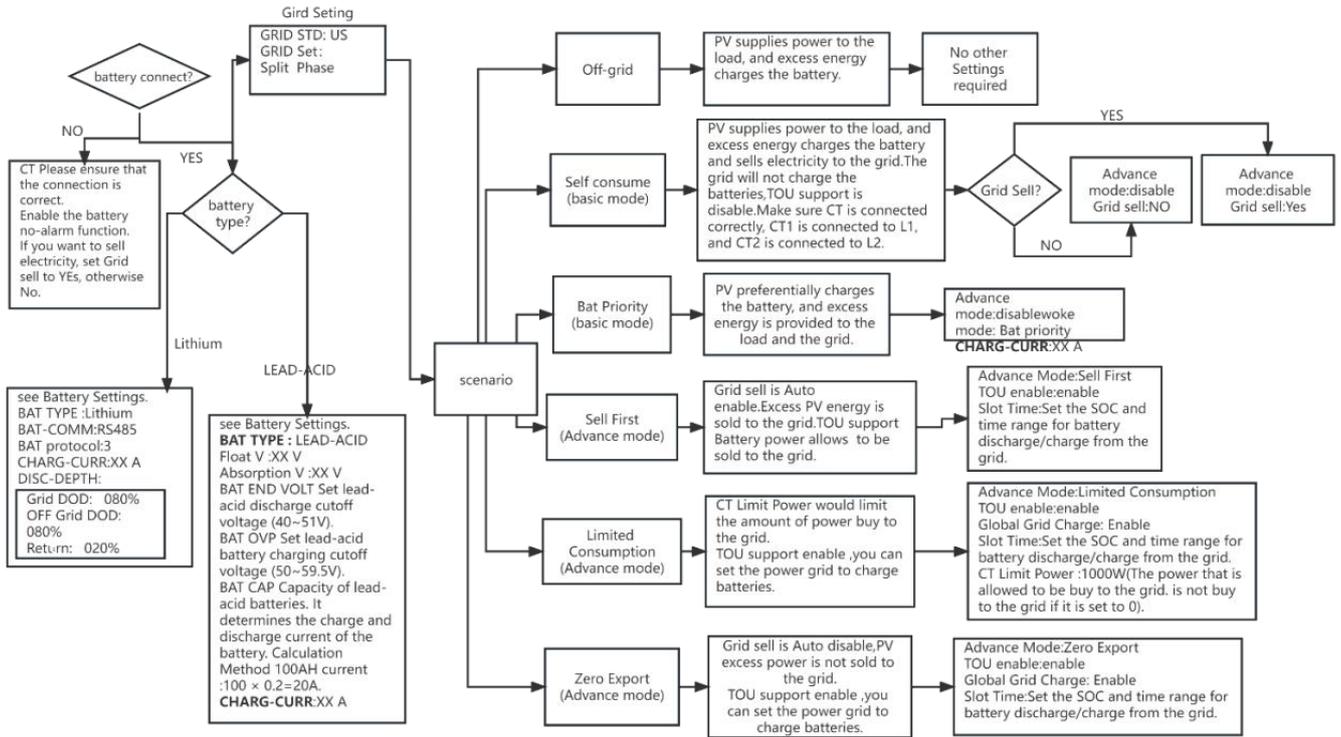
Step 6: Turn off the battery switch on every battery module.

Step 7: Release the power Button of inverter.

Household low-voltage energy storage system

9 LED Operation on Inverter

How to use the Hybrid Inverter.

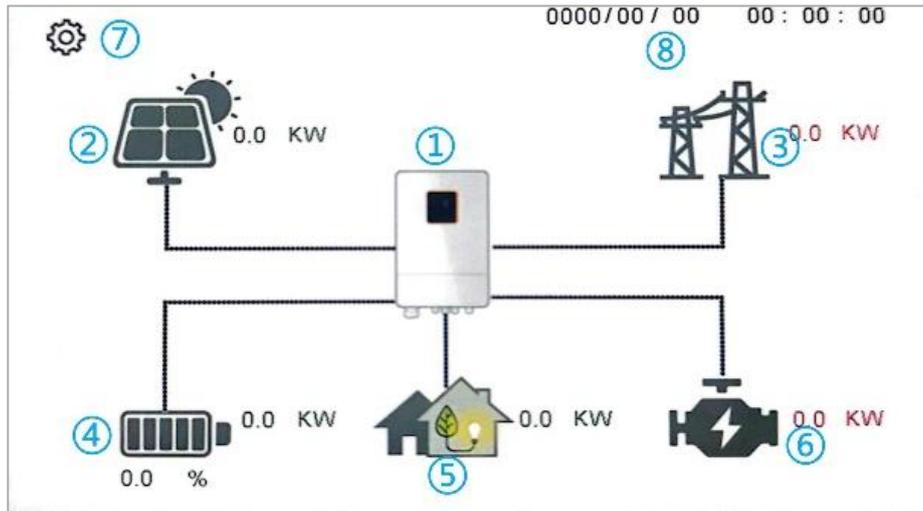


Abbreviated noun interpretation:

Abbreviation	Full name		
RSD	Rapid Shutdown	TOU	Time-of-use
CV	Constant voltage	Aux load SOC	Auxiliary load SOC
EPS	EMERGENCY POWER SYSTEM	GRID HYST	GRID Hysteresis
ZeroExportP	Zero Export Power		
BAT COM	Battery Communication		
DOD	Depth of discharge		
E-TODAY	Energy-Today		

Household low-voltage energy storage system

9.1 Control Panel



Code	Name	Explanation
1	Energy Storage Inverter	Click Energy Storage Inverter to enter the working status interface of the energy storage inverter.
2	PV	Display the real-time PV power. Click PV to enter the working status interface of PV.
3	Grid	Display the real-time grid power. Click Grid to enter the working status interface of grid.
4	Battery	Display the real-time battery power and percentage of battery surplus capacity from the BMS. Click Battery to enter the working status interface of battery.
5	Load	Display the real-time load power. Click Load to enter the working status interface of load.
6	Generator	Display the real-time generator power. Click generator to enter the working status interface of generator.
7	Setting	Users can click Setting to enter the settings interface.
8	Data/Time	Date and time of the inverter.

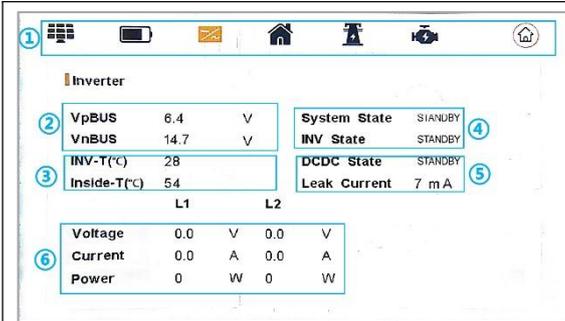
NOTE

It takes 2 seconds to upload the data to the screen. Please wait patiently.

Household low-voltage energy storage system

9.2 Working Status

9.2.1 Energy Storage Inverter



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

② **VPBUS:** Real-time voltage of bus capacitor of the Inverter.

③ Temperature

INV-T(°C): INV Temperature

Inside-T(°C):

Internal ambient temperature of the Inverter.

④

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

System Status: Display complete Inverter status information, include INIT, STANDBY, PV GRID, BAT GRID, BYP, AC BAT CHG, HYBRID POW etc.

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

GRID: Grid connected state.

OFF-GRID:

Off-GRID working state.

OFF GRID PL:

Working state of off-grid conversion to grid connection.

INV TO PFC: Status of power by public grid turn into on grid working mode.

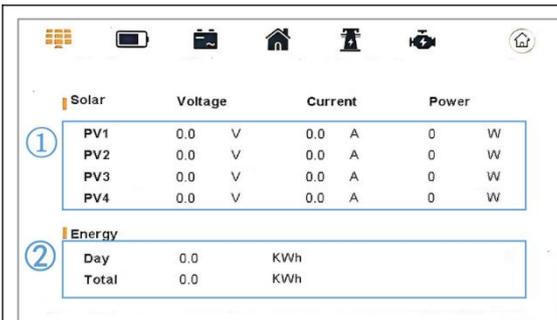
DCDC Status:

Displays charging and discharging status information, include STANDBY, CHARGE, DISCHARGE.

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

⑥ Display the **real-time voltage, current, and power** of the device.

9.2.2 PV



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

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

Household low-voltage energy storage system

9.2.3 Grid

① Display the working parameters on the grid, including **Frequency, real-time voltage, real-time current,** and **real-time power.**

② Accumulated energy from the power grid to the equipment (Sell) and accumulated energy from equipment to the power grid (Buy), including daily and total accumulated energy.

9.2.4 Battery

③ Three working states of batteries (from BMS), including **charging, discharging, and forced charging.**
 Charge EN: Charge Enable Discharge EN: Discharge Enable.

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

① Display the working parameters of the battery, including **real-time voltage, real-time current, battery surplus capacity, battery temperature, battery power,** and **battery type.**

② Display battery **charging voltage, charging current,** and **discharge current.**

9.2.5 Load

9.2.5.1 Load/Page One

Load

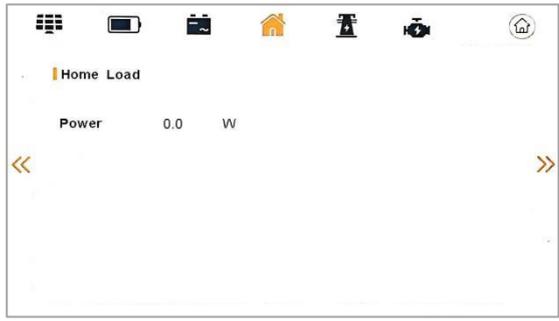
User can click « to return to the previous page, and click » to enter the next page. (not to be repeated later)

① Display the working parameters of the load, including **real-time voltage, current, and power.**

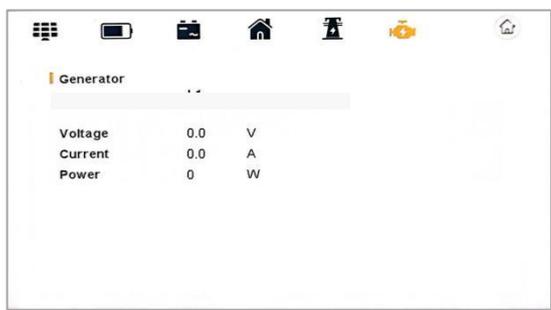
② Accumulated usage of load, including daily and total accumulated energy.

Household low-voltage energy storage system

9.2.5.2 Load/Page Two

Home Load	
 <p>The screenshot shows the 'Home Load' page with a navigation bar at the top containing icons for a menu, battery, inverter, home, generator, and camera. Below the navigation bar, the page title is 'Home Load'. Underneath, the text 'Power 0.0 W' is displayed. There are also left and right arrow navigation icons.</p>	<p>When set Home load EN to "ENABLE", if you have a load connected to the mains port, you can see its Home load power.</p>

9.2.6 Generator

 <p>The screenshot shows the 'Generator' page with a navigation bar at the top containing icons for a menu, battery, inverter, home, generator, and camera. Below the navigation bar, the page title is 'Generator'. Underneath, the text 'Voltage 0.0 V', 'Current 0.0 A', and 'Power 0 W' is displayed.</p>	<p>Display the working parameters of the generator, including real-time voltage, current, and power.</p>
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9.3 Setting

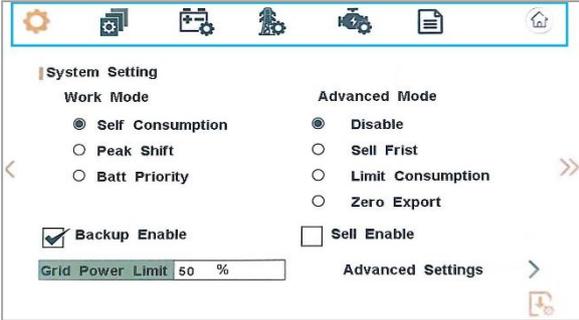
9.3.1 Enter Setting

9.3.1.1 Input password

 <p>The screenshot shows the password input screen. At the top, there is a navigation bar with icons. Below it, the word 'Password' is displayed. A blue circle with the number '1' points to a '+' icon. Below that, there is a text input field containing the number '0'. A blue circle with the number '2' points to an orange 'OK' button.</p>	<p>①Users can click on the icon above to enter device status data (PV, Battery, Energy Storage Inverter, Load, Grid, Generator) and return to the Home Page.</p> <p>②To enter the settings, a password is required. The default password is 11111. Click OK to enter the settings interface.</p>
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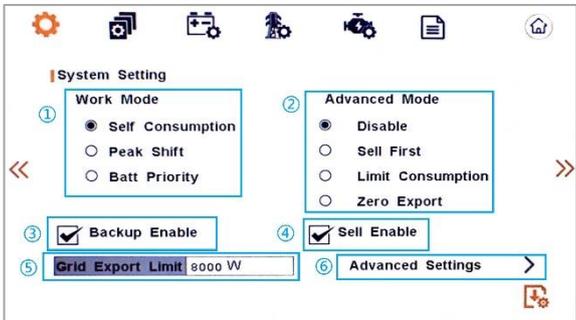
Household low-voltage energy storage system

9.3.1.2 Enter the settings interface

	<p>Users can click on the icon above to switch between setting options, Inverter related information, and return to the Home Page.</p>
<p>  : System Setting  : Parallel Setting  : Battery Setting  : Grid Setting  : Generator Setting  : Inverter Information  : Return Home Page  : After modifying the parameters, the user needs to click on this icon to confirm the modification. </p>	

9.3.2 Setting Option

9.3.2.1 System Setting/ Page One

	<p>① Work Mode: Users have three working modes to choose from, Self Consumption, Peak Shift, and Battery Priority.</p>
<p>② Advanced mode: There are four options here: Disable, Sell First Mode, Limited Consumption Mode and Zero Export Mode. For details about advanced modes.</p> <p>③ Backup Enable: When the Grid and PV are powered off, Enable the battery to supply power to the load, default option is enabled.</p> <p>④ Sell Enable (anti-reflux) : Whether the inverter is allowed to sell electricity to the grid. The option is checked, which means that the inverter can generate electricity to the grid, anti-reflux is disable. If this option is not selected, the inverter is prohibited from selling power to the power grid. This means anti-reflux is enabled.</p> <p>⑤ Grid Power Limit Users can click to enter the numerical input interface. This function is used to limit the inverter conversion power of the inverter. The default parameter is 8000w.</p> <p>⑥ Advanced Settings</p>	

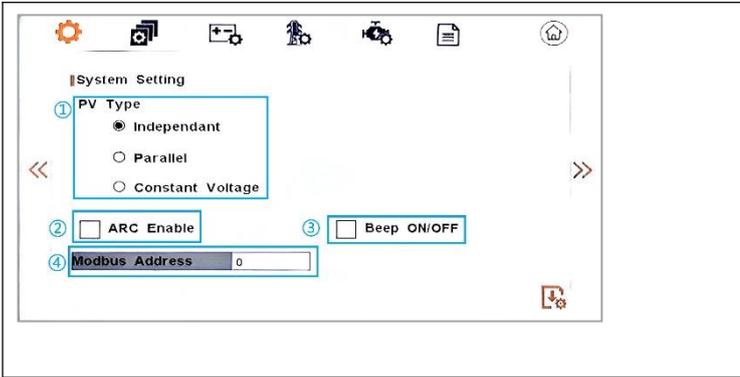
Household low-voltage energy storage system

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

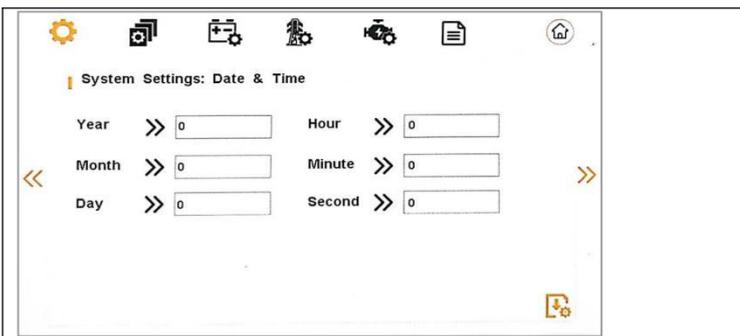
There are also some attributes of these mode: Global Grid Charge Enable, PV Charge Only, Bat Charge on Priority, Time-of-use Enable and 6 Time-of-use Slots.

For more advanced mode Settings, see Section 10.

9.3.2.2 System Setting/Page Two

	<p>① Users can set PV types, including Independent, Parallel and Constant Voltage.</p> <p>② Enable or Disable ARC detection function.</p> <p>③ Color screen alarm switch. Set enabled, the buzzer will sound when the inverter alarms.</p> <p>④ Modbus Address: Inverter 485 communication address bit. The default value is 1 and you do not need to change it.</p>
--	--

9.3.2.3 System Setting/Page Three

	<p>Date and Time settings</p> <p>Users can manually modify the year, month, day, hour, minute and second.</p> <p>The year input range should be between 2000 and 2099.</p>
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Household low-voltage energy storage system

9.3.2.4 System Setting/Page Four

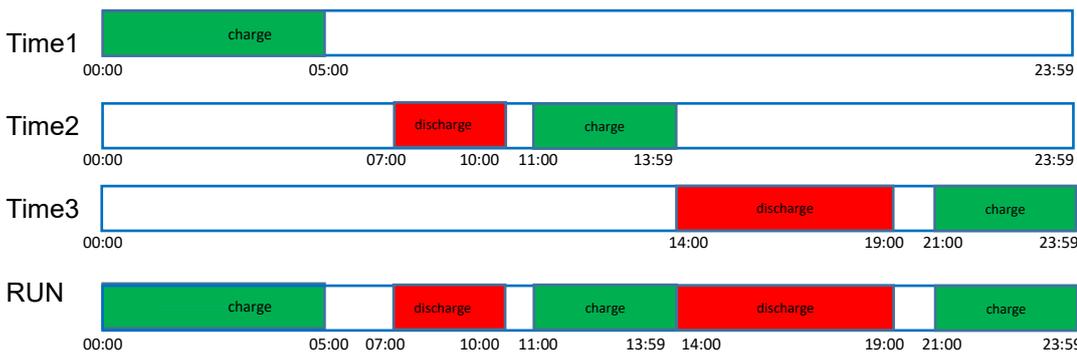
	<p>Setting of charging and discharging time for Peak Shift.</p> <p>When the working mode is Peak Shift, users need to enter this interface to set the charging and discharging time. And Users need to manually input the start charge/discharge time and the end charge/discharge time.</p>
--	--

WORKTIME*

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



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



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

9.3.3 Parallel Settings

	<p>① Parallel enable: Start or disable the parallel function.</p> <p>Master/Slave: This interface is used for parallel, and the inverter is selected as the master or slave.</p> <p>② Common Grid CT: Enable or disable CT sharing.</p>
--	--

③ **3 Phase Parallel:** Enable or disable group 3 phase enable.

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

Household low-voltage energy storage system

(Reserved function).

④ **Parallel num:** This operation is used to select the number of parallel Inverters.

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

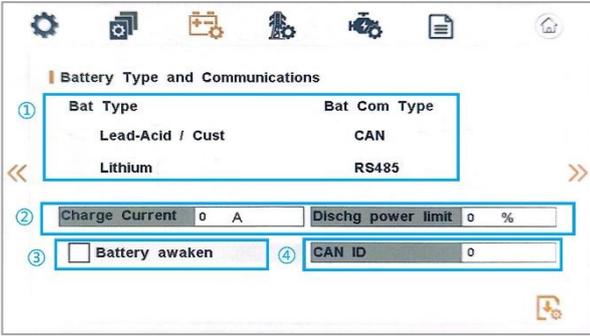
CT Ratio: Set the CT ratio to 1000:1 by default.

Charge Curr: This interface is used to select the parallel charging current.

Discharge Cur: This interface is used to select the parallel discharge current.

9.3.4 Battery Settings

9.3.4.1 Battery Type and Communications



① Set Battery Type and Battery Communication method.
Users can choose the **battery type** is lead-acid battery/lithium battery, and the **battery communication** method is CAN/485. The default option is CAN.

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

③ Battery wake-up :

When the battery is low and the battery relay has been disconnected, the inverter will send instructions to the battery forcibly sucking relay by BMS, and the inverter will charge.

The default option is disabled. (Partial battery support)

If you want to use this feature, please consult the battery brand supported by the dealer. Use it only when the battery is too low.

After the battery wakes up successfully, please turn off the function, otherwise it will affect the normal operation of the Inverter.

④ **CAN ID:** The default is 0, and this function is only used for lithium batteries with specific communication protocols. If required, please contact the supplier.

9.3.4.2 Battery Setting



charging current is $100A * 0.2 = 20A$).

Absorption Volt: Charge the battery with constant current.

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

② Settings required when using lithium

Bat Grid DOD/ Off-grid DOD: When the battery discharge is higher than the set parameter, the

① Settings required when using lead-acid batteries

Float Chg Volt: Charge the battery with constant voltage

Household low-voltage energy storage system

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

Bat Cutoff Volt: Discharge protection voltage (This interface is used to set the lead acid battery discharging voltage. (The input value ranges from 40 to 51) Discharge cut-off voltage, as recommended by the battery manufacturer).

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

inverter generates a battery low voltage alarm. Distinguish between grid-connected alarm parameters and off-grid alarm parameters.

Grid Eod Hyst /Off-grid Eod Hyst: When a low-voltage alarm is generated, the alarm is cleared if the battery charge is higher than the specified amount. The default minimum is 5% End Hyst.

9.3.5 Grid Setting

9.3.5.1 Grid Setting/Page one



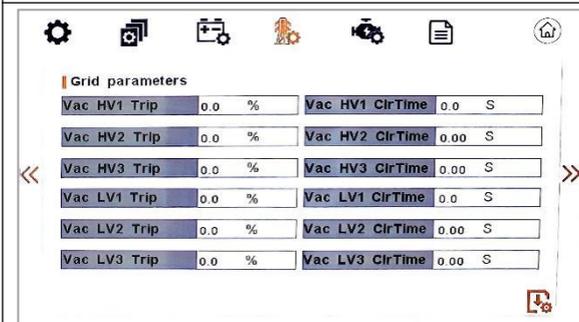
① Inverter use Split Phase, default option is Split Phase. (JP 120V is the reserved standard)

② **Low Voltage:** The input value of Grid low voltage. It is valid when grid mode selected custom.

High Voltage: The input value of Grid high voltage. It is valid when grid mode selected custom.

Low Freq: The input value of Grid low frequency. It is valid when grid mode selected custom.

High Freq: The input value of Grid high voltage. It is valid when grid mode selected custom.



③ **Grid Protect parameters:**

HV means high voltage trip protection.

LV means low voltage trip protection.

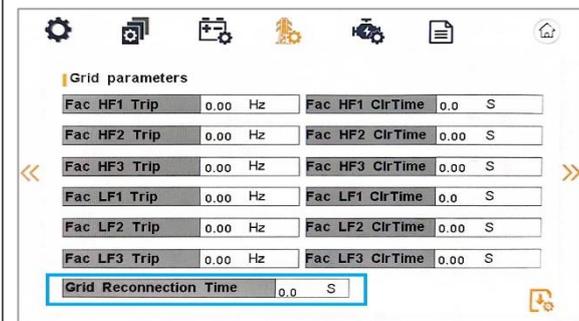
HF means high frequency trip protection.

LF means low frequency trip protection.

This parameter is determined by the national grid standards.

If the user needs to use over-voltage and under-voltage protection, please contact the supplier.

Grid Reconnection Time: The grid connection time can be set, but the minimum time cannot exceed 30S.



Household low-voltage energy storage system

9.3.5.2 Grid Setting/Page Two

	<p>This interface is used to select Grid standard. Users can set and switch grid standards according to their needs.</p>																		
<table border="0"> <tr> <td>AU: Australia</td> <td>AU-W: Western Australia</td> <td>NZ: New Zealand</td> </tr> <tr> <td>UK: United Kingdom</td> <td>PK: PAKISTAN</td> <td>KR: Korea</td> </tr> <tr> <td>PHI: Philippines</td> <td>CN: China</td> <td>US: America</td> </tr> <tr> <td>THAIL: THAILAND</td> <td>ZA: South Africa</td> <td>Custom 50H: User defined 50HZ</td> </tr> <tr> <td>POL: Poland</td> <td>EN50549</td> <td>VDE4105</td> </tr> <tr> <td>ITA: Italy</td> <td>Custom 60H: User defined 60HZ</td> <td>JM: Jamaica</td> </tr> </table>	AU: Australia	AU-W: Western Australia	NZ: New Zealand	UK: United Kingdom	PK: PAKISTAN	KR: Korea	PHI: Philippines	CN: China	US: America	THAIL: THAILAND	ZA: South Africa	Custom 50H: User defined 50HZ	POL: Poland	EN50549	VDE4105	ITA: Italy	Custom 60H: User defined 60HZ	JM: Jamaica	
AU: Australia	AU-W: Western Australia	NZ: New Zealand																	
UK: United Kingdom	PK: PAKISTAN	KR: Korea																	
PHI: Philippines	CN: China	US: America																	
THAIL: THAILAND	ZA: South Africa	Custom 50H: User defined 50HZ																	
POL: Poland	EN50549	VDE4105																	
ITA: Italy	Custom 60H: User defined 60HZ	JM: Jamaica																	

9.3.5.3 Grid Setting/Page Three

	<p>React Power: Reactive power control The input value should range between -60% and +60%, which varies with the standard.</p> <p>QU Wave: Voltage-reactive curve</p> <p>QP Wave: Active power-reactive power curve (These two functions are not available on the screen, please contact the distributor if you need to use them.)</p>
<p>REACT Power Parameter: including: Power Factor, React Power, QU Wave, QP Wave. (For specific country if required by the local grid.)</p> <p>Power Factor: The input value should range between L0.80 and L0.99 or C0.8 and C1.00.</p>	

9.3.5.4 Grid Setting/Page Four

	<p>When the grid voltage is abnormal, the charging power will be limited, and the function will be enabled if required by the national grid standards.</p>
--	--

Household low-voltage energy storage system

PWR-VOLT RES: Generation voltage response.

When the grid voltage is abnormal, the active power is limited, and the function is enabled when required by the national grid standard.

PWR-FREQ RES: Generation frequency response.

When the power grid frequency is abnormal, the active power will be limited, and the function will be enabled if required by the national power grid standard.

PFC-VOLT RES: Charge voltage response

When the grid voltage is abnormal, the charging power will be limited, and the function will be enabled if required by the national grid standards.

PFC-FREQ RES: Charge frequency response.

When the power grid frequency is abnormal, the charging power will be limited, and the function will be enabled if required by the national power grid standard.

Anti-Island: Anti-Island (The default option is enabled)

When the grid goes down, inverter will detect the loss of power and disconnect from the grid within milliseconds. It prevents your solar panels from feeding electricity into a downed power line.

Leak Current: Leak current detect (The default option is enabled.)

Insulation detection: Insulation detect (The default option is enabled).

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

Home load EN: Enable home load statistics.

9.3.6 Generator Setting

① Diesel generator enable settings:

Gen Enable: Enable control of the Generator function.

Gen Chare Enable: Generator Charge Enable control.

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

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

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

② Diesel generator parameter setting:

Start SOC: When the SOC of battery is lower than the set

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

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

Gen Power: Rated power of Generator.

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

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

Household low-voltage energy storage system

point, the Generator dry contact is enabled and Generator Manual operation is disabled, the connected Generator will be started.

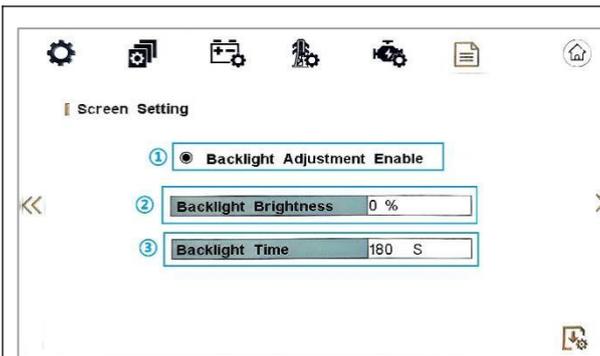
9.3.7 Inverter Information

9.3.7.1 Inverter Information/Page One



- ① Show inverter module.
- ② Energy storage inverter serial number.
- ③ Show Inverter Software version.
- ④ Display firmware version.

9.3.7.2 Inverter Information/Page Two

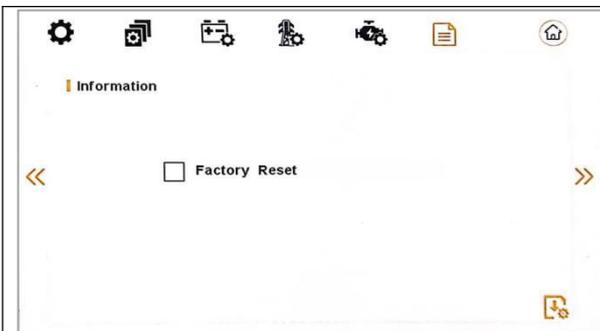


- ① Screen backlight adjustment control,

you can use the following options to control the screen backlight. If the option does not enable, the screen will turn off in 3 minutes by default.

- ② Screen backlight brightness adjustment. The value ranges from 0 to 100%.
- ③ Set the screen-off time, value ranges from 5 to 250S.

9.3.7.3 Inverter Information/Page Three

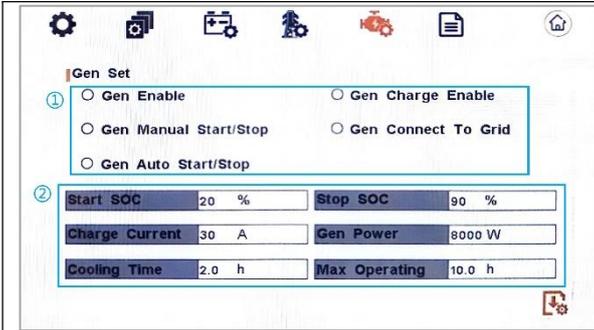


This interface is used to reset the inverter.

Household low-voltage energy storage system

10 Generator Setting

10.1 Generator Setting (Lithium Battery)



① Diesel generator enable settings:

Gen Enable: Enable control of the Generator function.

Gen Chare Enable: Generator Charge Enable control.

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

Gen Manual Start/Stop:

The on/off command in manual control mode.

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

② Diesel generator parameter setting:

Start SOC: Generator in automatic mode. When the SOC of battery is lower than the set point, the Generator dry contact is turn-on and the connected Generator will be started.

Stop SOC: Generator in automatic mode. When the SOC of battery is higher than the set point, the Generator dry contact is disconnected, the connected Generator will be stopped (START SOC < STOP SOC).

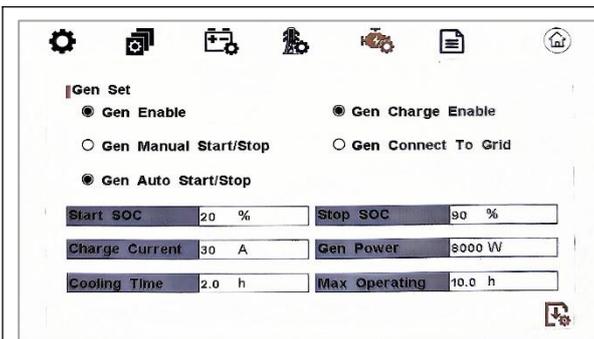
Charge Current: It indicates the maximum current that the inverter charges the battery from Generator.

Gen Power: Rated power of Generator.

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

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

10.2 Generator Automatic Mode Setting



①

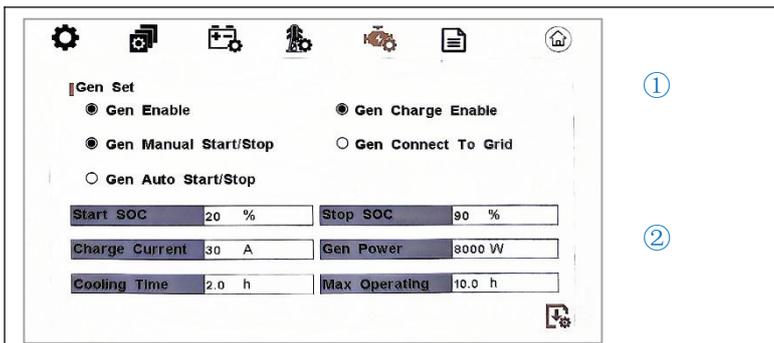
As shown in the picture on the left, select Gen Enable, Gen auto and Gen charge enable. Set generator on, off SOC or voltage, charging current, generator power, stop cooling time, maximum running time.

②

If use the first connection mode, select Gen Connect To Grid.

Household low-voltage energy storage system

10.3 Generator Manual Mode Setting



As shown in the picture on the left, select Gen Enable, Gen Manual and Gen charge enable. charging current, generator power, stop cooling time, maximum running time.

11 Inverter Parallel System

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

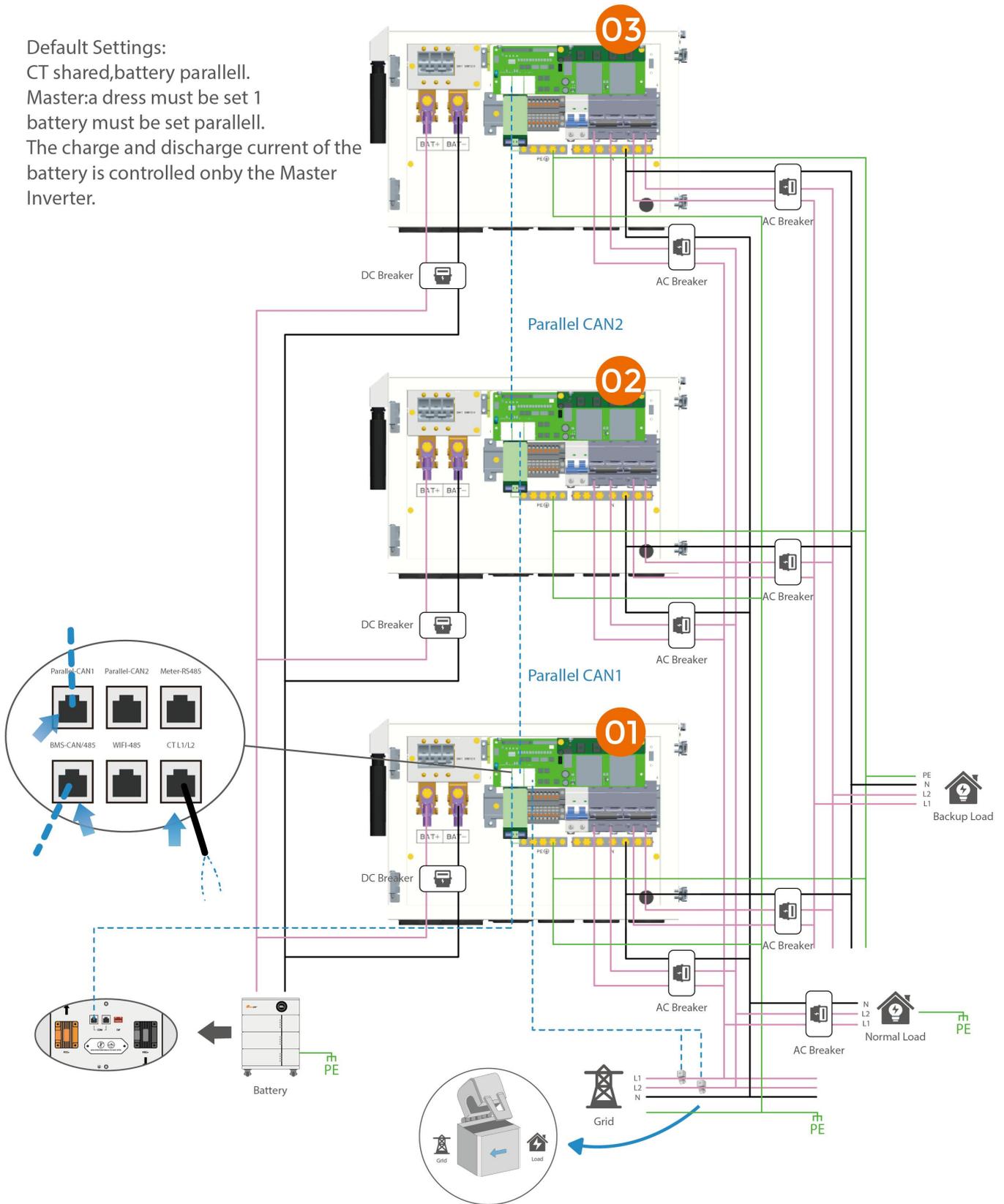
When using the parallel Inverter, the user can choose to share CT or not share CT (without sharing CT, each inverter should be connected to one CT, CT connection method is the same as the single Inverter connection method). To use external loads, users must select the COMMON CT wiring method (as shown below) and select COMMON CT ENABLE.

The inverter uses the battery parallel connection mode by default. When using multiple batteries, please refer to the battery manual to correctly connect to the inverter, and connect the battery communication line to the master.

Household low-voltage energy storage system

11.1 Split Phase (120/240Vac) Parallel Connection

Default Settings:
 CT shared, battery parallell.
 Master: a dress must be set 1
 battery must be set parallell.
 The charge and discharge current of the battery is controlled only the Master Inverter.



Household low-voltage energy storage system

11.2 120/208 Three Phase(American Standard)

Default Settings:

CT shared, battery parallel.

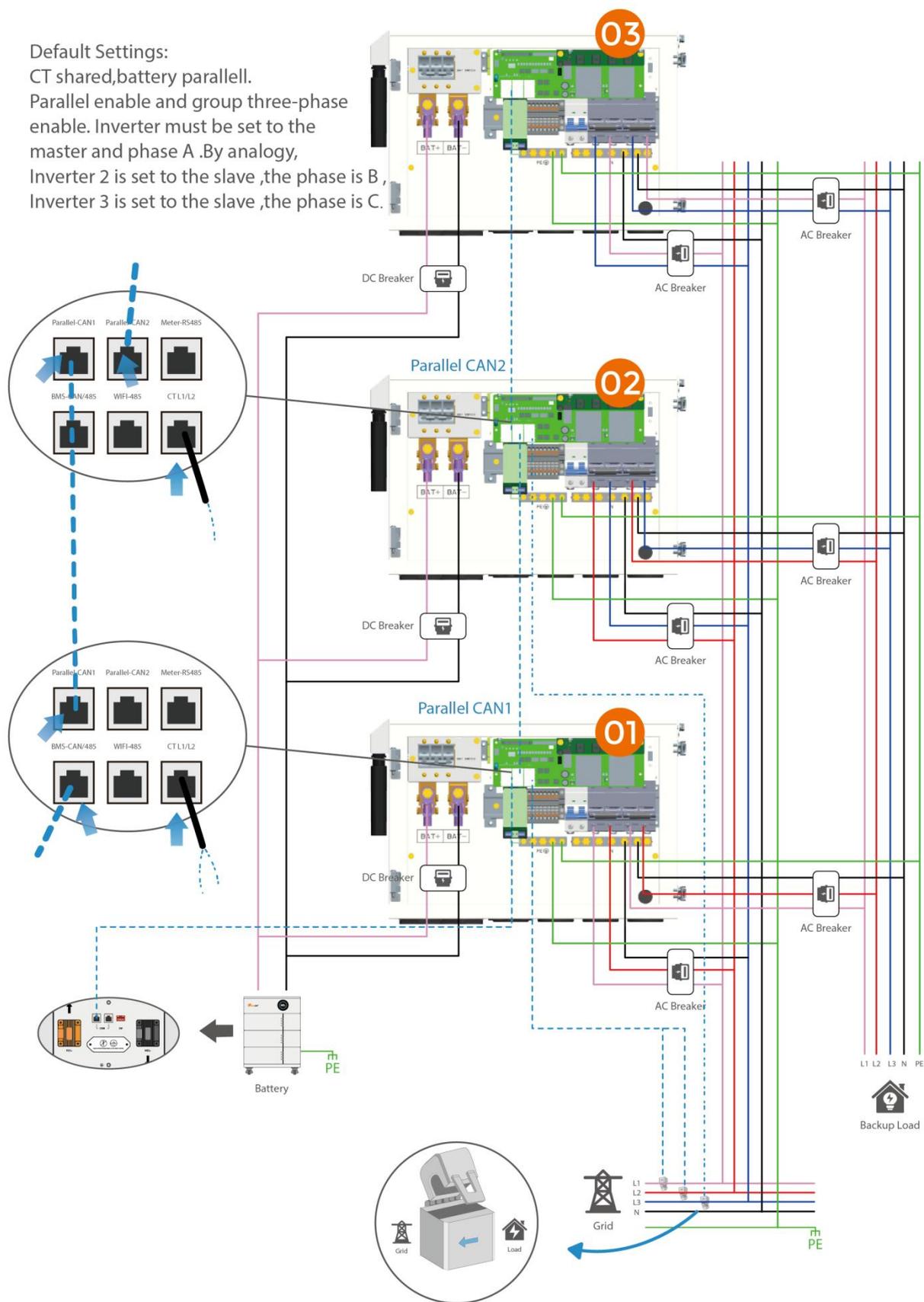
Parallel enable and group three-phase

enable. Inverter must be set to the

master and phase A. By analogy,

Inverter 2 is set to the slave, the phase is B,

Inverter 3 is set to the slave, the phase is C.



Household low-voltage energy storage system

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

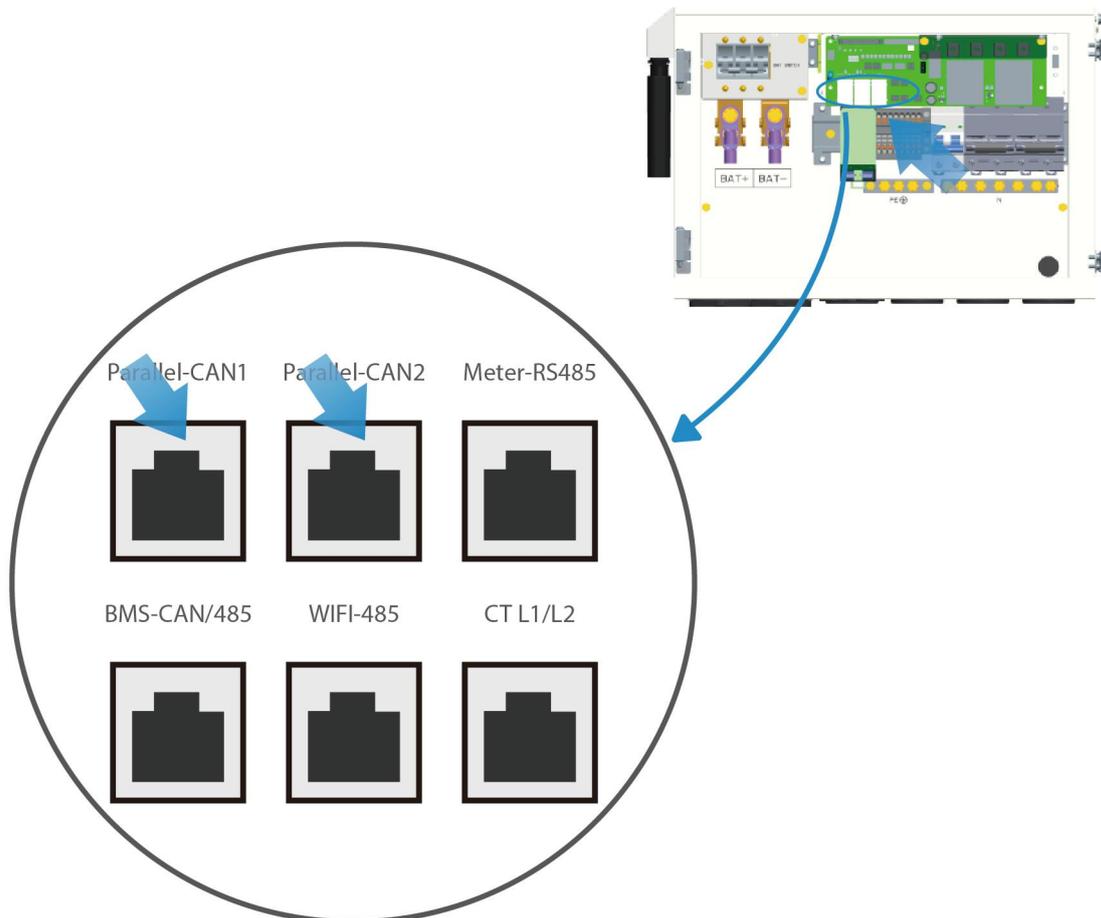
When using the parallel Inverter, the user can choose to share CT or not share CT (without sharing CT, each inverter should be connected to one CT, CT connection method is the same as the single Inverter connection method). To use external loads, users must select the COMMON CT wiring method (as shown below) and select COMMON CT ENABLE.

The inverter uses the battery parallel connection mode by default. When using multiple batteries, please refer to the battery manual to correctly connect to the inverter, and connect the battery communication line to the master.

11.3 Parallel Communication Cable Connection

For parallel communication, CAT 5 cables are needed. The units should be connected hand by hand.

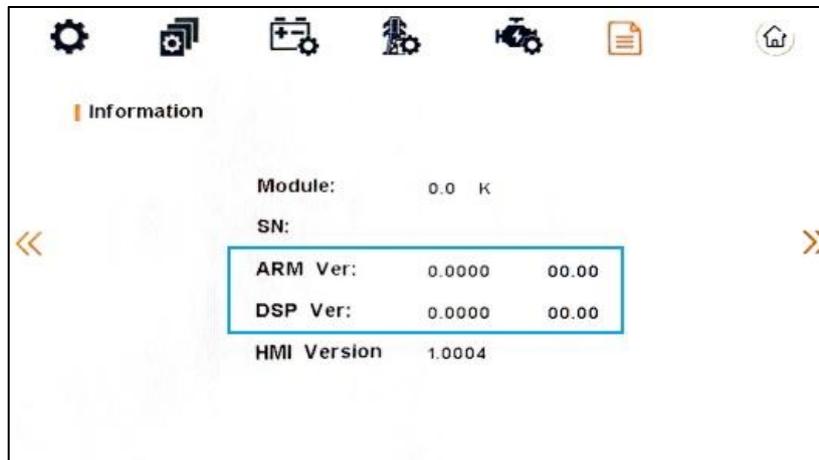
When using common batteries, BMS cable needs to be connected to the master unit. The inverter shares the BMS information by inter-unit parallel communication cable.



Household low-voltage energy storage system

11.4 Parallel Operation Notes

1) Make sure all the units in parallel are with the same software version. Password->Information

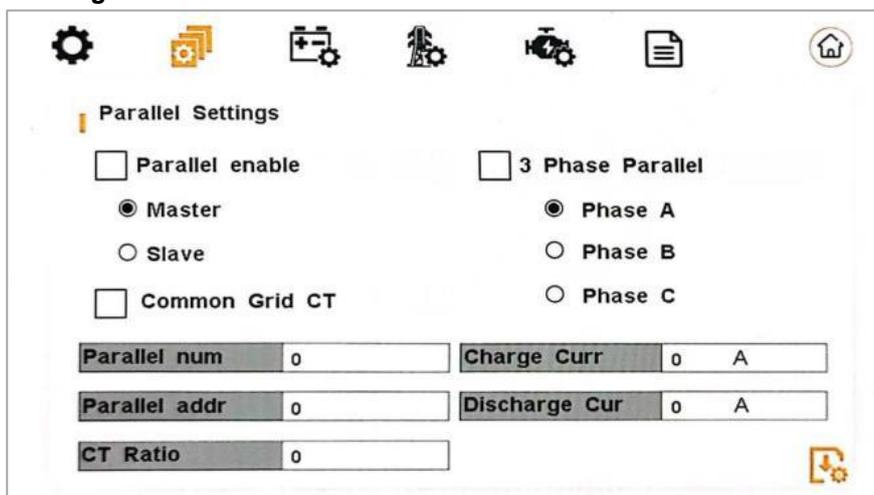


- 2) Please check the diagram above. The common batteries use is supported on default for maximizing the system efficiency. The BMS cable should be connected to the master inverter.
- 3) Connect the loads of the two inverters together first. It should be noted that the grid power line and the load line of the two inverters should be roughly the same length.
- 4) Make sure the CT Limiter sensor is installed properly. If the load is connected outside the inverter, user need to choose common CT and make sure the CT ratio is right (the default 90A CT ratio is 1:1000, no need to change). The common CT is only needed to be connected to the master inverter. Please install CT on every unit's incoming electrical service wire on L1 and L2 when choosing independent CT.
- 5) Please check the master and slaver's setting by screen and make sure all the setting are correct.

11.5 Parallel System Setting

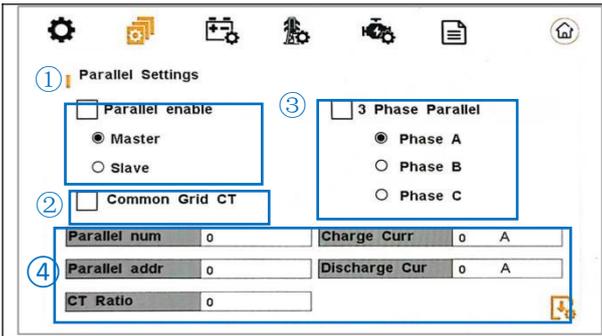
The parallel setting page can be visited in the following steps in the screen:

Password->Parallel Settings



Household low-voltage energy storage system

11.5.1 Parallel Settings

	<p>① Parallel enable: Start or disable the parallel function.</p> <p>Master/Slave: This interface is used for parallel, and the inverter is selected as the master or slave.</p> <p>② Common Grid CT: Enable or disable CT sharing.</p>
--	--

③ **3 Phase Parallel:** Enable or disable group 3 phase enable.
PHASE A/B/C: This interface is used to select the output phase of the device when three phases are used. (Reserved function).

④ **Parallel num:** This operation is used to select the number of parallel Inverters.
Parallel addr: This interface is used to select the parallel address, the host address is set to 1 by default, there is a slave, and the slave is set to 2; If there are two slaves, the slaves are set to 2 and 3 respectively; the address settings of each inverter cannot be the same.
CT Ratio: Set the CT ratio to 1000:1 by default.
Charge Curr: Set the total battery charging current of multiple parallel inverters, and the current will be evenly distributed to each inverter. Parameters are set only by the master.
Discharge Cur: Set the total battery discharge current of multiple parallel inverters, and the current will be evenly distributed to each inverter. Parameters are set only by the master.

NOTE

If you need to assemble the split phase into three phases, please make the following settings:
1. 3PHASE EN; 2. PARALLEL EN; 3. PHASE Selection; 4. Grid Standard (United States);
5. Power Grid Settings (US 208V); 6. Master/slave selection; 7. Number of parallel machines; 8. ADDRESS.

12 Advanced Mode Operation Guide

12.1 Advanced Mode Introduction

The hybrid inverter can be programmed to control how and when to use grid power. The Advanced mode allow management of flexible loads and time-of-use billing.

There are three advanced mode available: **Sell First Mode**, **Limited Consumption Mode** and **Zero export Mode**.

Household low-voltage energy storage system

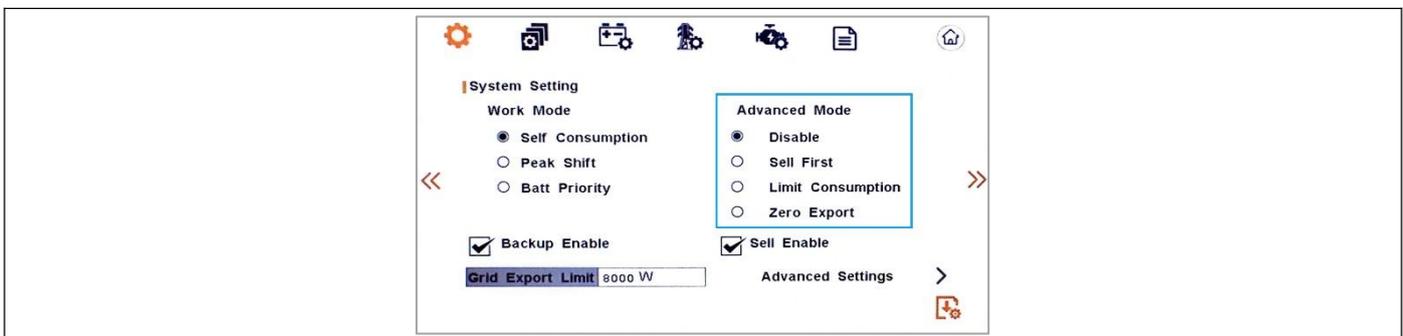
	Selling First	Limited Consumption	Zero export
Grid sell Disable/Enable	Ignored. Be enabled automatically.	For those region with feed-in-tarriff, plz enabled it.	Ignored. Be disabled automatically.
Mode Description	<p>Features: Bat storage power can be sold out to power under TOU control.</p> <p>When TOU is enabled: When inside time slots: Charge or Discharge to grid at scheduled time and specific power without caring consumption.</p> <p>When outside of the time slots: The grid can not charge the battery, only allow the PV to charge the battery.</p> <p>When TOU is disabled: Always charge the battery first whatever from pv or grid. The battery doesn't discharge on grid mode.</p>	<p>Features: Use some grid power first, then use battery storage power under TOU control.</p> <p>When TOU is enabled: Day time: PV power load and charge battery first, surplus power feedback to grid (grid sell enable) or limit the pv yield (grid sell disable). The grid charge can be scheduled.</p> <p>When outside of the time slots: The grid can not charge the battery, only allow the PV to charge the battery.</p> <p>When TOU is enabled: Night time: discharge battery to power the load if the battery capacity is available. For those region with tiered electricity price, user can set ct limit power to use some grid power first. The grid charge can be scheduled.</p> <p>When TOU is disabled: Always charge the battery first whatever from pv or grid. The battery doesn't discharge on grid mode.</p>	<p>Features: Never sell power to grid forever.</p> <p>When TOU is enabled: Day time: PV power load and charge battery first, surplus power will be limited automatically. The grid charge can be scheduled.</p> <p>When outside of the time slots: The grid can not charge the battery, only allow the PV to charge the battery.</p> <p>When TOU is enabled: Night time: discharge battery to power the load if the battery capacity is available. The grid charge can be scheduled.</p> <p>When TOU is disabled: Always charge the battery first whatever from pv or grid. The battery doesn't discharge on grid mode.</p>

Household low-voltage energy storage system

There are also some attributes of these mode: Global Grid Charge Enable, PV Charge Only, Battery First, Time-of-use Enable and 6 Time-of-use Slots. The time slots parameters are shown in as below:

Start Time	End Time	Bat Power	Grid Charge	Bat SOC
00:00	05:00	8000 W	√	50 %
05:00	08:00	8000 W		50 %
08:00	10:00	8000 W	√	50 %
10:00	16:00	8000 W		50 %
16:00	19:00	8000 W	√	50 %
19:00	23:59	8000 W	√	50 %

12.1.1 Advanced Mode Setting



Advanced mode:

There are four options here: Disable, Sell First Mode, Limited Consumption Mode and Zero Export Mode.

Disable: Only when users selected “Disable”, the three work modes (Self Consumption, Peak Shift, battery priority) take effect. When the user selects the other three options, the three working modes (Sell First, Limit Consumption, Zero Export) are invalid.

Sell First: First consider selling electricity to the grid. In this mode the Sell-Enable setting is automatically enabled. The users can use this mode to sell back surplus solar power to grid. If time of use is enabled, the battery power can also be sold to grid (Excess PV and battery power can be sold to the grid) .

Limit Consumption: In this mode, the CT limiters are used to sense the grid power flow direction. The hybrid inverter can be select to sell power or not sell power to grid. There is a CT Limit Power parameter available in this mode. When the battery is needed to discharge to reduce the load consumption, the grid will cover the parameter set part consumption firstly and the battery discharges energy to makes up the rest part. Other conditions are similar to SELF CONSUME working mode (Excess PV power can be sold to the grid through CT Limit.) .

Zero Export: In this mode, the CT limiters should be installed in the input of the inverter's grid port. The hybrid inverter will not sell power to grid. The user can use Zero export power parameter to ensure the inverter won't feedback power to grid (Neither PV nor battery excess power is sold to the grid) .

⑥ **Advanced Settings**

Users can click to Advanced Setting enter the advanced settings interface.

There are also some attributes of these mode: Global Grid Charge Enable, PV Charge Only, Bat Charge on Priority, Time-of-use Enable and 6 Time-of-use Slots.

Advanced Settings/First Page:

Household low-voltage energy storage system

i Time-of-use Enable: There are 6 slots which can be programmed. If grid charge is enabled, the grid is used to power the load and charge the battery to target SOC at specific bat power attribute value. If selling electricity to the grid enable, the battery will discharge to target SOC at specific battery power attribute value.

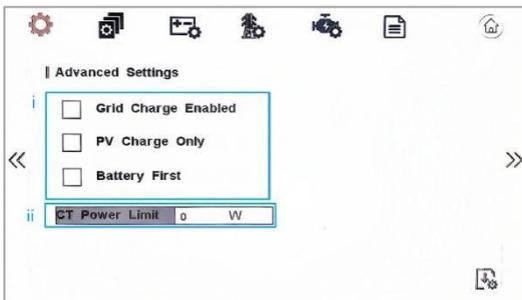
Grid: Grid is ticked, indicating that in the effective interval of the current interface time period, if the set SOC is greater than the actual SOC of the battery, the power grid will charge the battery (if not ticked, the power grid will not charge the battery); if the set SOC is less than the actual SOC of the battery, the battery can be discharged.

GEN: GEN is ticked to indicate charging with GEN.

Batt power: The power that the grid charges and discharges to the battery

ii Only when TOU Enable is selected, the time table in the figure can be effective.

Advanced Settings/Second Page:



i. Users have three advanced settings to choose from, namely Global Grid Charge Enable, PV Charge Only and Battery First.

Global Grid Charge Enable: It is advanced control attribute of grid charge enable. If time of use function is disabled, this attribute is used to judge whether or not to charge the battery by grid. If time of use function is enabled, the battery can be charged by grid only when the time slot grid charge attribute is enabled.

PV Charge Only: If user don't want to use grid to charge the battery in any time, please enable this attribute. The PV energy will be used first for the load, and then the excess energy will be used to charge the battery. If the PV energy is insufficient, the battery will power the load.

Battery First: If there will be a storm or other emergency, user can use this attribute to adjust the power distribution priority. If this attribute is disabled, the solar power will cover the load on priority by default.

ii. **CT Power Limit:** This function takes effect only in Limit Consumption mode and is used to draw power from the grid.

NOTE

If the use time is started and the inverter is operating outside the timeline, it will run in SELF CONSUME mode. Advanced mode only makes sense when both the battery and the grid exist.

13 Fault Diagnosis and Solutions

13.1 Inverter

Content	Codes	Explanation	Solutions
DischgOverCur	01	Battery discharge over current. When the battery is loaded, the load is too large.	(1) Nothing needed to do, wait one minute for the inverter to restart. (2) Check whether the load is in compliance with the specification. (3) Cut off all the power and shut down all the Inverters; disconnect the load and plug in to restart Inverters, then check
Over Load	02	The load power is greater than other power. (PV, BAT)	(1) Check whether the load is in compliance with the maximum power of the Inverter. (2) Cut off all the power and shut down all the

Household low-voltage energy storage system

			<p>Inverters; disconnect the load and plug in to restart Inverters, then check whether the load is short circuited if the fault has been eliminated.</p> <p>(3) Contact customer service if error warning continues.</p>
Bat Disconnect	03	Battery Disconnect. (Battery voltage not identified)	<p>(1) Check whether the battery is connected.</p> <p>(2) Check if battery wiring port is open circuited.</p> <p>(3) Contact customer service if error warning continues.</p>
Bat Under Vol	04	Battery voltage low that normal range.	<p>(1) Checking System Settings, If so, power off and restart.</p> <p>(2) Check if the grid power down. If so, wait for grid to power up, the inverter will automatically charge.</p> <p>(3) Contact customer service if error warning continues.</p>
Bat Low capacity	05	Bat Low capacity	<p>(1) Battery Low that setting capacity. (SOC<100%-DOD)</p>
Bat Over Vol	06	The battery voltage is greater than the Inverter maximum voltage.	<p>(1) Checking System Settings, If so, power off and restart.</p> <p>(2) Contact customer service if error warning continues.</p>
Gird low vol	07	Grid voltage is abnormal	<p>(1) Check if the grid is abnormal.</p> <p>(2) Restart the inverter and wait until it functions normally.</p> <p>(3) Contact customer service if error warning continues.</p>
Grid over vol	08		
Grid low Freq	09	Grid Frequency is abnormal.	<p>(1) Check if the grid is abnormal.</p> <p>(2) Restart the inverter and wait until it functions normally.</p> <p>(3) Contact customer service if error warning continues.</p>
Grid over Freq	10		
Gfci over	11	Inverter GFCI exceeds standard.	<p>(1) Check PV string for direct or indirect grounding phenomenon.</p> <p>(2) Check peripherals of Inverter for current leakage.</p> <p>(3) Contact the local inverter customer service if fault remains unremoved.</p>
bus under vol	14	BUS voltage is lower than normal.	<p>(1) Check the input mode setting is correct.</p> <p>(2) Restart the inverter and wait until it functions normally.</p> <p>(3) Contact customer service if error warning continues.</p>
bus over vol	15	BUS voltage is over	<p>(1) Check the input mode setting is correct.</p>

Household low-voltage energy storage system

		maximum value.	(2) Restart the inverter and wait until it functions normally.
Inv over cur	16	The inverter current exceeds the normal value.	(1) Restart the inverter and wait until it functions normally.
Chg over cur	17	Battery charge current over than the Inverter maximum voltage.	(1) Restart the inverter and wait until it functions normally.
Meter Comm Fail	18	Meter Comm Fail	(1) Check whether the meter communication line is connected correctly.
Inv under vol	19	INV voltage is abnormal	(1) Check if the INV voltage is abnormal.
Inv over vol	20		(2) Restart the inverter and wait until it functions normally. (3) Contact customer service if error warning continues.
Inv Freq Abnor	21	INV frequency is abnormal	(1) Check if the INV frequency is abnormal. (2) Restart the inverter and wait until it functions normally. (3) Contact customer service if error warning continues.
Igbt temp high	22	The inverter temperature is higher than the allowed value	(1) Cut off all the power of the Inverter and wait one hour, then turn on the power of the Inverter.
bat over temp	23	Battery temperature is higher than the allowed value.	(1) Disconnect the battery and reconnect it after an hour.
bat Under Temp	25	Battery temperature is low than the allowed value.	(1) Check the ambient temperature near the battery to see if it meets the specifications.
Relay open circuit	26	Grid side relay open circuit detection	(1) Used to detect whether the relay on the power grid side is disconnected due to a fault.
BMS comm. fail	28	Communication between lithium battery and inverter is abnormal.	(1) Check the cable, crystal, Line sequence. (2) Checking the Battery switch.

Household low-voltage energy storage system

Fan fail	29	Fan fail	(1) Check whether the Inverter temperature is abnormal. (2) Check whether the fan runs properly. (If you can see it)
Grid Phase err	31	The grid fault phase.	(1) Check power grid wiring
Arc Fault	32	PV Arc Fault	(1) Check Photovoltaic panels, PV wire. (2) Contact customer service if error warning continues.
bus soft fail	33	Hardware may be damaged and need to troubleshoot the cause	(1) Restart the inverter and wait until it functions normally. (2) Contact customer service if error warning continues.
inv soft fail	34		
bus short	35		
inv short	36		
fan fault	37	Fan fault.	(1) Check whether the Inverter temperature is abnormal. (2) Check whether the fan runs properly. (If you can see it)
PV iso low	38	PV iso low	(1) Check if the PE line is connected to the inverter and is connected to the ground. (2) Contact customer service if error warning continues.
Bus Relay Fault	39	The inverter may be damaged	(1) Restart the inverter and wait until it functions normally. (2) Contact customer service if error warning continues.
Grid Relay Fault	40		
EPS rly fault	41		
Gfci fault	42		
Selftest fail	45		
System fault	46		
Current DCover	47		
Voltage DCover	48		

13.2 Battery

Fault Code	Fault Information	Trouble Shooting
C01	Battery overvoltage	Restart the unit, if the error happens again, please return to repair center.
C02	Battery undervoltage	Restart the unit, if the error happens again, please return to repair center.
C03	Cell overvoltage	Restart the unit, if the error happens again, please return to repair center.
C04	Cell undervoltage	Restart the unit, if the error happens again, please return to repair center.
C05	Charge overcurrent	Restart the unit, if the error happens again, please return to repair center.

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C06	Discharge overcurrent	Restart the unit, if the error happens again, please return to repair center.
C07	MOS overtemperature	1. The inner temperature is over the limitation. 2. Check whether the ambient temperature is too high.
C08	MOS undertemperature	1. The internal temperature is lower than the limit range. 2. Check whether the ambient temperature is too low.
C09	Cell overtemperature	Restart the unit, if the error happens again, please return to repair center.
C10	Cell undertemperature	Restart the unit, if the error happens again, please return to repair center.
C11	Abnormal current sampling	Restart the unit, if the error happens again, please return to repair center.
C12	Abnormal output impedance	Restart the unit, if the error happens again, please return to repair center.
C13	Parallel failed	1. Please check if single unit is installed to parallel system. 2. If this error happens during parallel installation, please check wires connection. If they are connected correctly, please finish parallel installation first, and then Restart the unit. 3. If the problem remains, please contact your installer.
C14	Output loss	1. Please check whether the circuit breaker is closed; 2. Please check whether the fuse is normal; 3. Restart the unit, If the error happens again, please return to repair center.



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