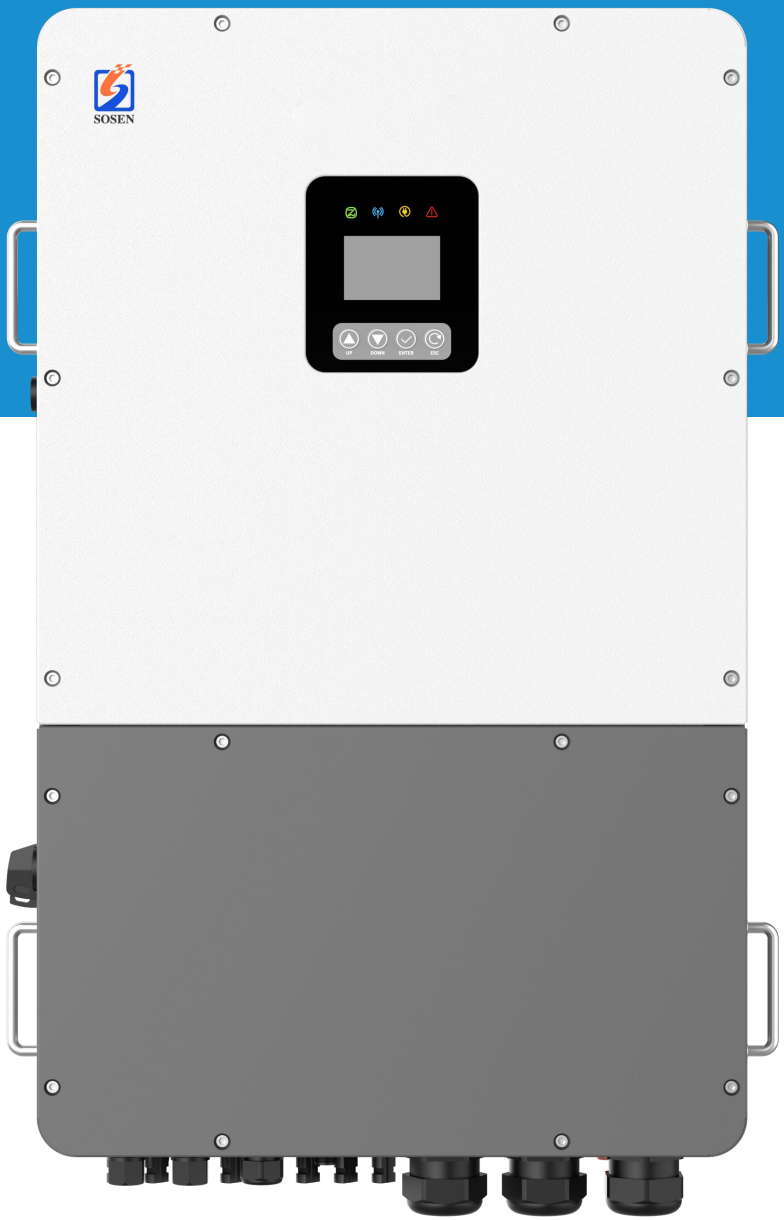
User Manual

Hybrid Inverter

SSE-HH30-70K-P3US-S Series



SSE-HH30K-P3US-S
SSE-HH40K-P3US-S
SSE-HH50K-P3US-S
SSE-HH60K-P3US-S
SSE-HH70K-P3US-S

Please read this manual before use and follow its guidance.
Keep this manual for future reference.

CONTENTS

1.About This Manual 1
1.1 Applicable Model 1
1.2 Target Group 1
1.3 Symbol Definition 1
2.Safety Precaution 1
2.1 General Safety 1
2.2 PV String Safety 2
2.3 Inverter Safety 2
2.4 Battery Safety 3
2.5 Personal Requirements 3
3.Product Introduction 4
3.1Product Features 4
3.2 Working Mode 6
3.3 Appearance 7
3.4 System Diagram 14
4. Check and Storage 15
4.1 Check Before Receiving 15
4.2 What's in the box? 15
4.3 Storage 16
5.Installation 16
5.1 Installation Requirements 16
5.2 Inverter Installation 19
6.Electrical Connection 20
6.1 Safety Precaution 20
6.2 Connection Port Description 21
6.3 PE Cable Connection 22
6.4 PV Connection 22
6.5 EPS and Grid,Generator Connection 24
6.6 Battery Connection 25
6.7 Communication Cable Installation 27
6.8 CT Connection 29
6.9 Meter Connection 30
6.10 Wiring System for Inverter 31
6.11 Wiring System for Diesel Generator 34
6.12 Three phase parallel connection system 35
7. Wi-Fi&BLE stick installation 36
7.1 Indication 36
7.2 Install the Wi-Fi&BLE stick 36
7.3 Web/APP 37
7.4 Wi-Fi Connection 37
7.5 Installation qualification 37
7.6 LED indication and trouble shooting 38
8.Operation 39
8.1 Indicator panel 39
8.2 LCD operation flow chart 40

8.3 LCD Display Icons 41
8.4 System Setup Menu 43
8.5 Basic Settings Menu 45
8.6 Work Mode Settings Menu 45
8.7 Battery Settings Menu 48
8.8 Grid Settings Menu 52
8.9 Generator Port Settings Menu 56
8.10 Advanced Settings Menu 58
8.11 Record Menu 61
8.12 Device Info Setup Menu 62
8.13 Factory Setting Menu 63
9.Trouble Shooting 64
10.Maintenance 67
10.1 Power ON the Inverter for first time 67
10.2 Power Off the Inverter 67
10.3 Removing the Inverter 68
10.4 Disposing of the Inverter 68
10.5 Routine Maintenance 68

1.About This Manual

This manual describes the product information, installation, electrical connection, commissioning, troubleshooting, and maintenance. Read through this manual before installing and operating the product. All the installers and users have to be familiar with the product features, functions, and safety precautions. This manual is subject to update without notice. For more product details and latest documents, visit https://www.soseninverter.com.

1.1 Applicable Model

Model	Nominal Output Power	Nominal Output Voltage
SSE-HH30K-P3US-S	30kW	120/208V a.c,3W+N+PE
SSE-HH40K-P3US-S	40kW	277/480V a.c,3W+N+PE
SSE-HH50K-P3US-S	50kW	
SSE-HH60K-P3US-S	60kW	
SSE-HH70K-P3US-S	70kW	

1.2 Target Group

This manual is intended for qualified and knowledgeable electrical technical personnel who are responsible for hybrid inverter installation and commissioning in the energy storage system and electric system.

1.3 Symbol Definition

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

DANGER	WARNING	CAUTION	NOTICE
“Danger” indicates a hazardous situation with a high level of risk that, if not avoided, will result in death or serious injury.	“Warning” indicates a hazardous situation with a medium level of risk that, if not avoided, could result in death or serious injury.	“Caution” indicates a hazardous situation with a low level of risk that, if not avoided, could result in minor or moderate injury.	“Notice” provides some tips and methods to solve product-related problems to save time.

2.Safety Precaution

Please strictly follow these safety instructions in the user manual during the operation.

2.1 General Safety

NOTICE

- The information in this user manual is subject to change due to product updates or other reasons. This guide cannot replace the product labels or the safety precautions in the user manual unless otherwise specified. All descriptions here are for guidance only.
- Before installations, read through the quick installation guide. For additional information, please see the user manual.
- All installations should be performed by trained and knowledgeable technicians who are familiar with local standards and safety regulations.
- Use insulating tools and wear personal protective equipment when operating the equipment to ensure personal safety. Wear anti-static gloves, cloths, and wrist strips when touching electron devices to protect the inverter from damage.
- Strictly follow the installation, operation, and configuration instructions in this manual. The manufacturer shall not be liable for equipment damage or personal injury if you do not follow the instructions.

2.2 PV String Safety

DANGER

Connect the DC cables using the delivered PV connectors. The manufacturer shall not be liable for the equipment damage if other connectors or terminals are used.

WARNING

- Ensure the component frames and the bracket system are securely grounded.
- Ensure the DC cables are connected tightly, securely, and correctly.
- Measure the DC cables with a multimeter to avoid reverse polarity connection. Also, the voltage should be under the permissible range.
- Do not connect one PV string to more than one inverter at the same time. Otherwise, it may cause damage to the inverter.
- The PV modules used with the inverter must have an IEC61730 class A rating.
- When the photovoltaic array is exposed to light, it supplies a d.c. voltage to the inverter.

2.3 Inverter Safety

WARNING

- The voltage and frequency at the connecting point should meet the on-grid requirements.
- Additional protective devices like circuit breakers or fuses are recommended on the AC side. Specification of the protective device should be at least 1.25 times the AC rated output current.
- Make sure that all the groundings are tightly connected. When there are multiple inverters, make sure that all the grounding points on the enclosures are equip Potential bonding.
- Off-grid function is not recommended if the PV system is not configured with batteries. Otherwise, the risk in system power usage is beyond the equipment manufacturer's warranty scope.
- It should be taken into account the characteristics of photovoltaic power instability, if the battery is not connected, there is no EPS function.

DANGER			
• All labels and warning marks should be visible after the installation. Do not cover, scrawl, or damage any label on the equipment. • Warning labels on the inverter are as follows:			
	DANGER High voltage hazard. Disconnect all incoming power and turn off the product before working on it.	5min	Delayed discharge. Wait 5 minutes after power off until the components are completely discharged.
	Read through the user manual before working on this device.		Potential risks exist. Wear proper PPE before any operations.
	High-temperature hazard. Do not touch the product under operation to avoid being burnt.		Grounding point.
	With CE mark & the inverter fulfills the basic requirements of the guideline governing Low-Voltage and electron-magnetic compatibility.		Do not dispose of the inverter as household waste. Discard the product in compliance with local laws and regulations, or send it back to the manufacturer.

2.4 Battery Safety

WARNING

• The battery used with the inverter shall be approved by the inverter manufacturer. The approved battery list can be obtained through the official website.

• Before installations, read through the corresponding battery's User Manual to learn about the product and the precautions. Strictly follow its requirements.

• If the battery discharged completely, please charge it in strict accordance with the corresponding model's User Manual.

• Factors such as: temperature, humidity, weather conditions, etc. may limit the battery's current and affect its load.

• Contact after-sale service immediately if the battery is not able to be started. Otherwise, the battery might be damaged permanently.

• Use the multimeter to measure the DC cable to avoid reverse polarity connection. Also, the voltage should be under the permissible range.

• Do not connect one battery group to several inverters at the same time. Otherwise, it may cause damage to the inverter.

2.5 Personal Requirements

NOTICE

• Personnel who install or maintain the equipment must be strictly trained, learn about safety precautions and correct operations.

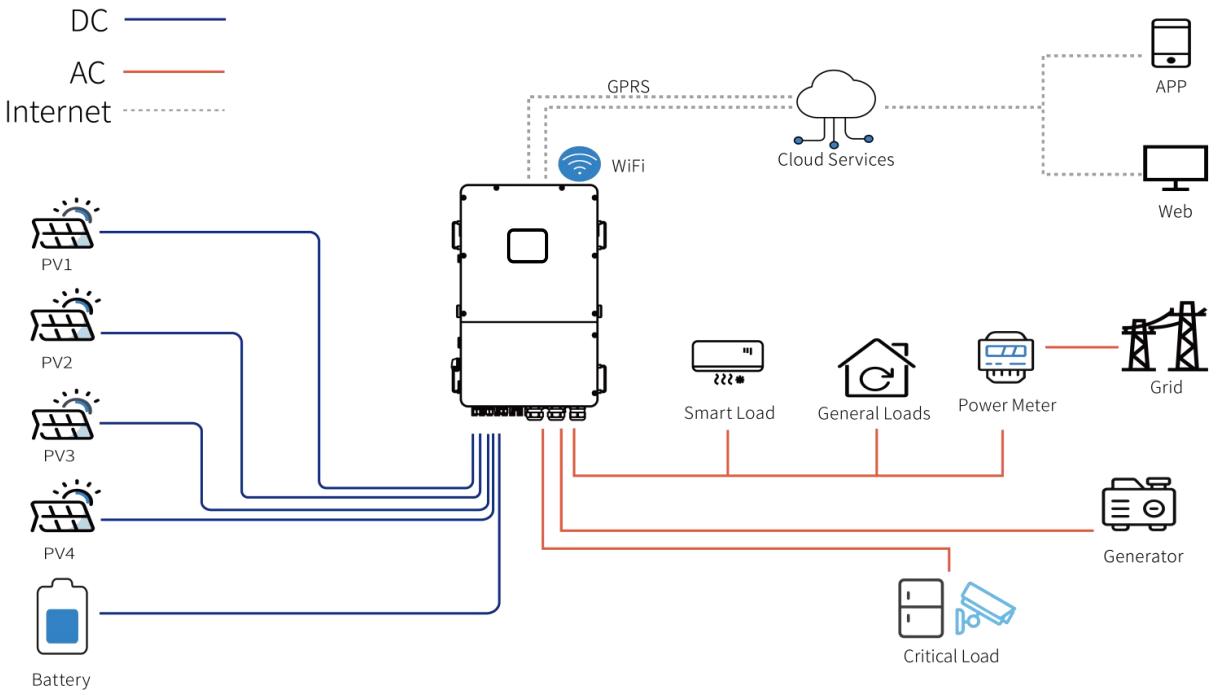
• Only qualified professionals or trained personnel are allowed to install, operate, maintain, and replace the equipment or parts.

3.Product Introduction

3.1Product Features

Intended usage

The SSE-HH30-70K-P3US-S series hybrid inverters apply to energy storage system with battery, loads and grid.The energy produced by PV system shall be used to optimize self-consumption, excess power charge battery and the rest power could be fed into the grid. Battery shall be discharged to support loads when PV power is insufficient to meet self-consumption. if both PV power and battery power is insufficient, the system will take power from grid to support loads.Work mode depends on PV energy and user's preference.

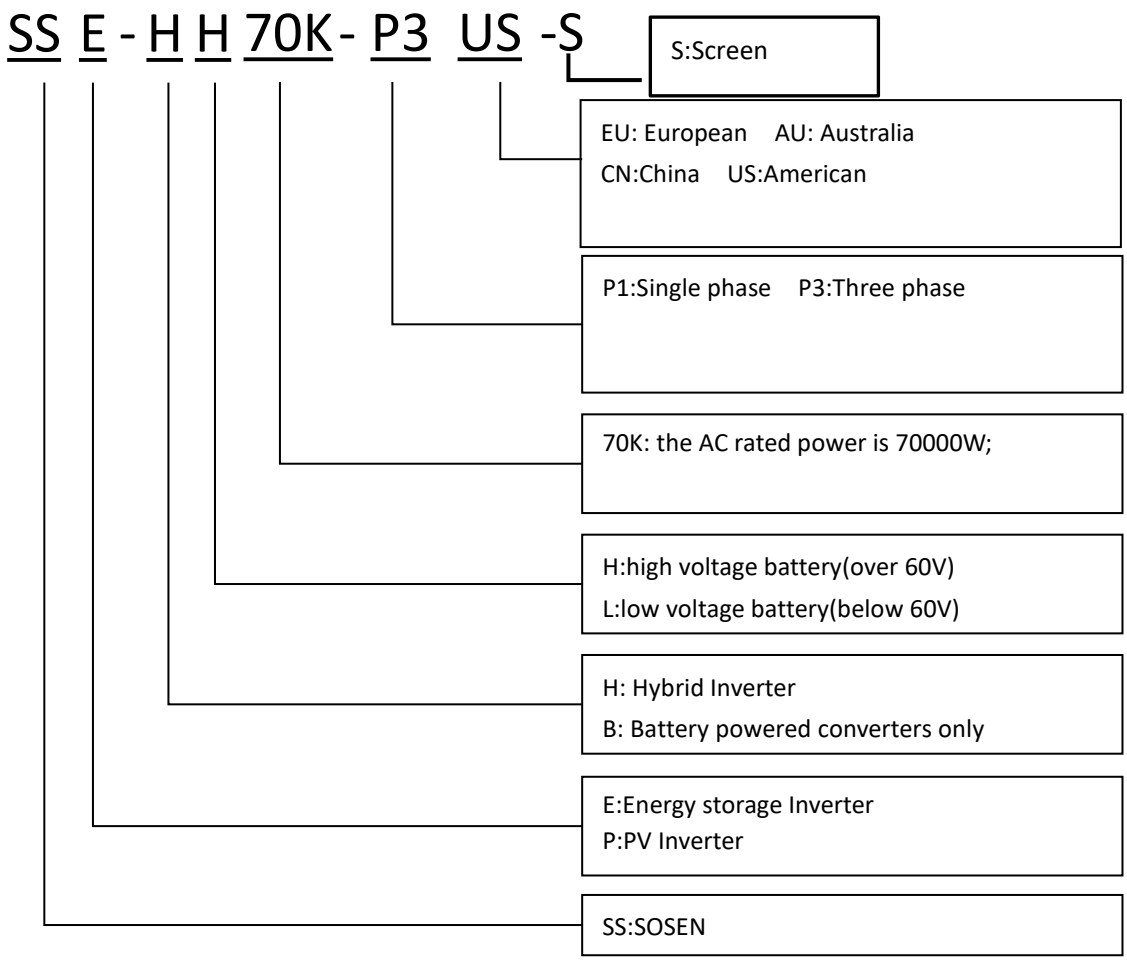


Model

This manual applies to the listed inverters below:

SSE-HH30K-P3US-S SSE-HH40K-P3US-S SSE-HH50K-P3US-S SSE-HH60K-P3US-S SSE-HH70K-P3US-S

Model description



Series Code:

SN: SXXXXXXXX2401100001

Series Code description

No.	Referring to	Code	Description
1	Brand name	S	SOSEN
2	Product category	XXXXXXXX	Inverter model ID
3	Production date	24	The year of production
4	Production date	01	The month of production
5	Production date	11	The day of production
6	Production serial number	00001	serial number

3.2 Working Mode

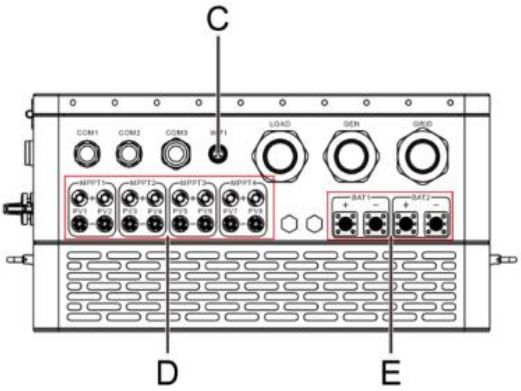
The SSE-HH30-70K-P3US-S Series hybrid inverter has the following work modes based on your configuration and layout conditions.

Work modes	Description
Self Use (with PV Power)	Priority: load>battery>grid The energy produced by the PV system is used to optimize self-consumption. The excess energy is used to charge the batteries, then exported to gird.
Self Use (without PV Power)	Priority: load>battery When no PV supplied, battery will discharge for local loads firstly, and grid will supply power when the battery capacity is not enough.
TOU[1] Eco	This mode can be used to meet users' demand for peak cutting and valley filling and achieve maximum economic benefit in areas with large difference of peak and valley electricity price. **Peak price:**The battery is discharged at full power to sells electricity to the grid at a high price **Flat price:**Run spontaneous self-use mode. **Valley price:** Buy electricity from the grid at a low price to charge the battery at full power
Back up only	Priority: load>battery When entering this mode, the system will start to charge the battery until it is fully charged and remains fully charged, waiting for the power grid to fail. When the grid is off, system will supply emergency power from PV or battery to supply the home loads .
Grid Priority	Priority: load>grid When the system works in this mode, the electricity generated by the photovoltaic will be preferentially connected to the grid. Users can send requests to the grid at peak times, and in this mode, users can set the end of the battery SOC point.

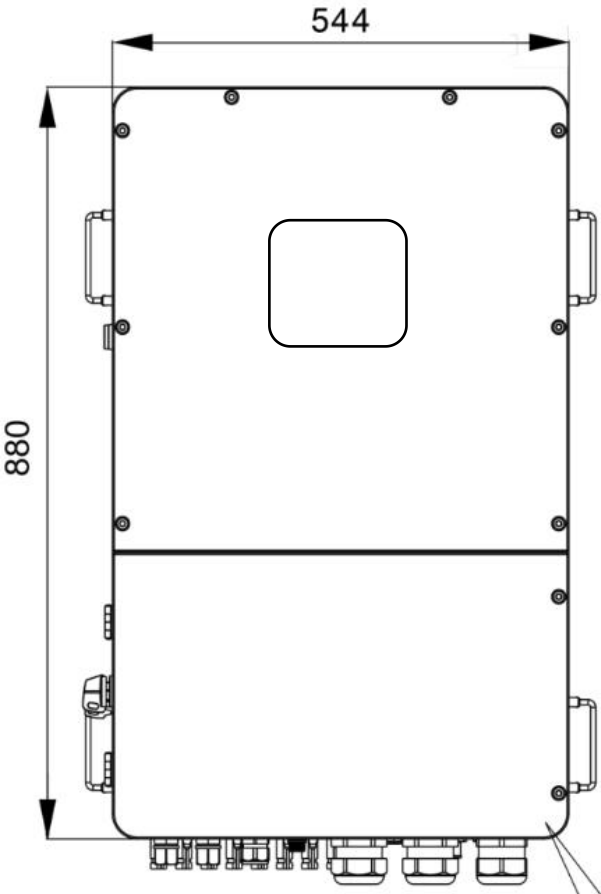
DANGER

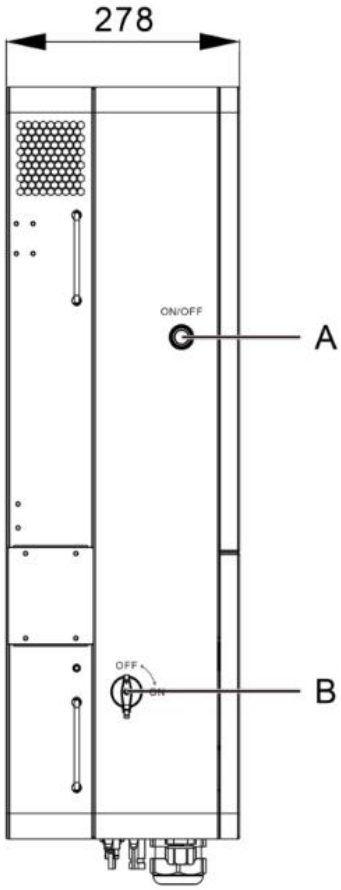
Make sure the load powering rating in within the EPS's output rating. Or the inverter will shut down with an 'over load' warning.When an “over load” is appeared, adjust the load power make sure it is with the range of the EPS output, and turn the inverter on.For the nonlinear load, please pay attention to the inrush power make sure it is within the range of the EPS output.

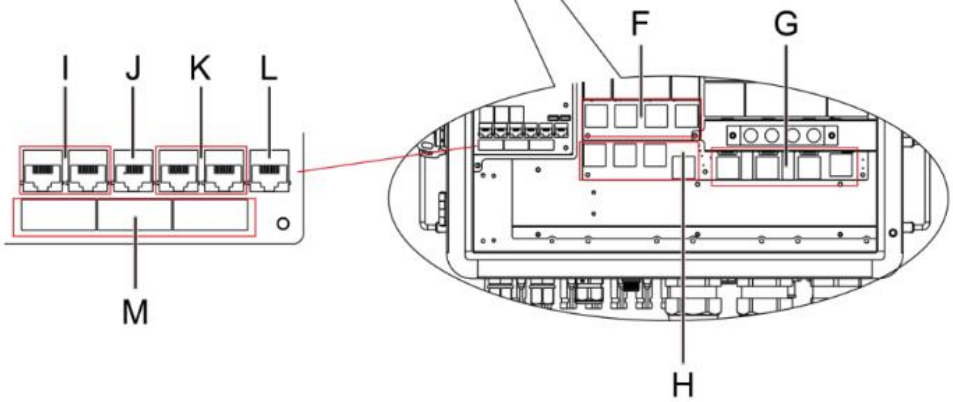
3.3 Appearance



item	Description	item	Description
A	Power on/off button	B	PV switch
C	WIFI	D	PV connector
E	Battery connector	F	Generator input
G	Grid	H	Load
I	Parallel port	J	DRM port
K	BMS port	L	Meter port
M	Function port		







3.3.1 Nameplate

The nameplate is for reference only.

SOSEN

Hybrid Inverter

Model	SSE-HH30K-P3US-S
Max.PV input voltage	1000V d.c
PV input voltage range	150-950V d.c
Max.PV input current	20A d.c*8
Isc PV	30A d.c*8
Grid rated voltage	120/208V a.c,3W+N+PE
Grid rated frequency	50/60Hz
Grid rated output current	83.3A a.c
Grid rated output power	30kW
Grid rated output apparent power	30kVA
GEN rated input current	83.3A a.c
GEN rated input power	30kW
EPS rated output voltage	120/208V a.c,3W+N+PE
EPS rated output frequency	50/60Hz
EPS rated output current	83.3A a.c
EPS rated output power	30kW
EPS rated output apparent power	30kVA
Power Factor	0.8Leading-0.8Lagging
Battery voltage range	150-850V d.c
Max.charge/discharge current	100A d.c*2
Battery type	Li-ion/Lead-acid
Protective class	I
Ingress protection degree	IP66
Overvoltage category	PV: II AC: III
Inverter topology	Non-isolated
Operating temperature range	-25℃ — +60℃

Manufacturer:
Shenzhen SOSEN Innovation Technology Co.,Ltd

Address:
Room 601,Pengzhanhui No 1 Building, Zhongxin Road No 233,
Xinqiao Community, Xinqiao Street, Baoan District, Shenzhen, China

SN:

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Made in China

SOSEN

Hybrid Inverter

Model	SSE-HH40K-P3US-S
Max.PV input voltage	1000V d.c
PV input voltage range	150-950V d.c
Max.PV input current	20A d.c*8
Isc PV	30A d.c*8
Grid rated voltage	277/480V a.c,3W+N+PE
Grid rated frequency	50/60Hz
Grid rated output current	48.1A a.c
Grid rated output power	40kW
Grid rated output apparent power	40kVA
GEN rated input current	48.1A a.c
GEN rated input power	40kW
EPS rated output voltage	277/480V a.c,3W+N+PE
EPS rated output frequency	50/60Hz
EPS rated output current	48.1A a.c
EPS rated output power	40kW
EPS rated output apparent power	40kVA
Power Factor	0.8Leading-0.8Lagging
Battery voltage range	150-850V d.c
Max.charge/discharge current	100A d.c*2
Battery type	Li-ion/Lead-acid
Protective class	I
Ingress protection degree	IP66
Overvoltage category	PV: II AC: III
Inverter topology	Non-isolated
Operating temperature range	-25℃ — +60℃

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SOSEN

Hybrid Inverter

Model	SSE-HH50K-P3US-S
Max.PV input voltage	1000V d.c
PV input voltage range	150-950V d.c
Max.PV input current	20A d.c*8
Isc PV	30A d.c*8
Grid rated voltage	277/480V a.c,3W+N+PE
Grid rated frequency	50/60Hz
Grid rated output current	60.1A a.c
Grid rated output power	50kW
Grid rated output apparent power	50kVA
GEN rated input current	60.1A a.c
GEN rated input power	50kW
EPS rated output voltage	277/480V a.c,3W+N+PE
EPS rated output frequency	50/60Hz
EPS rated output current	60.1A a.c
EPS rated output power	50kW
EPS rated output apparent power	50kVA
Power Factor	0.8Leading-0.8Lagging
Battery voltage range	150-850V d.c
Max.charge/discharge current	100A d.c*2
Battery type	Li-ion/Lead-acid
Protective class	Ⅰ
Ingress protection degree	IP66
Overvoltage category	PV: Ⅱ AC: Ⅲ
Inverter topology	Non-isolated
Operating temperature range	-25℃ — +60℃

Manufacturer:
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Hybrid Inverter

Model	SSE-HH60K-P3US-S
Max.PV input voltage	1000V d.c
PV input voltage range	150-950V d.c
Max.PV input current	20A d.c*8
Isc PV	30A d.c*8
Grid rated voltage	277/480V a.c,3W+N+PE
Grid rated frequency	50/60Hz
Grid rated output current	72.2A a.c
Grid rated output power	60kW
Grid rated output apparent power	60kVA
GEN rated input current	72.2A a.c
GEN rated input power	60kW
EPS rated output voltage	277/480V a.c,3W+N+PE
EPS rated output frequency	50/60Hz
EPS rated output current	72.2A a.c
EPS rated output power	60kW
EPS rated output apparent power	60kVA
Power Factor	0.8Leading-0.8Lagging
Battery voltage range	150-850V d.c
Max.charge/discharge current	100A d.c*2
Battery type	Li-ion/Lead-acid
Protective class	Ⅰ
Ingress protection degree	IP66
Overvoltage category	PV: Ⅱ AC: Ⅲ
Inverter topology	Non-isolated
Operating temperature range	-25℃ — +60℃

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SOSEN

Hybrid Inverter

Model	SSE-HH70K-P3US-S
Max.PV input voltage	1000V d.c
PV input voltage range	150-950V d.c
Max.PV input current	20A d.c*8
Isc PV	30A d.c*8
Grid rated voltage	277/480V a.c,3W+N+PE
Grid rated frequency	50/60Hz
Grid rated output current	84.2A a.c
Grid rated output power	70kW
Grid rated output apparent power	70kVA
GEN rated input current	84.2A a.c
GEN rated input power	70kW
EPS rated output voltage	277/480V a.c,3W+N+PE
EPS rated output frequency	50/60Hz
EPS rated output current	84.2A a.c
EPS rated output power	70kW
EPS rated output apparent power	70kVA
Power Factor	0.8Leading-0.8Lagging
Battery voltage range	150-850V d.c
Max.charge/discharge current	100A d.c*2
Battery type	Li-ion/Lead-acid
Protective class	Ⅰ
Ingress protection degree	IP66
Overvoltage category	PV: Ⅱ AC: Ⅲ
Inverter topology	Non-isolated
Operating temperature range	-25℃ — +60℃

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3.3.2 Features

- 100% unbalanced output, each phase
- AC couple to retrofit existing solar system
- Max. charging/discharging current of 100A
- High voltage battery, higher efficiency
- 6 time periods for battery charging/discharging
- Support storing energy from diesel generator
- Max. 6 PCS parallel for on-grid and off-grid operation; Support multiple batteries parallel

3.3.3 Specification

Model	SSE-HH30K-P3US-S	SSE-HH40K-P3US-S	SSE-HH50K-P3US-S	SSE-HH60K-P3US-S	SSE-HH70K-P3US-S
Product Type	Hybrid Inverter				
Battery					
Battery type	Li-ion/Lead-acid				
Battery voltage range	150-850Vd.c				
Full power Battery voltage range	150-700V d.c	200-850V d.c	250-850V d.c	300-850V d.c	350-850V d.c
Max.charge/discharge Power	30 kW / 30 kW	40 kW / 40 kW	50 kW / 50 kW	60 kW / 60 kW	70 kW / 70 kW
Rated battery voltage	150V d.c	200V d.c	250V d.c	300V d.c	350V d.c
Rated charge/discharge current	2*100 A d.c				
Max. charge/discharge current	2*100 A d.c				
Reverse Connect Protection	Yes				
Communication interface	CAN/RS485				
Input (PV)					
Recommended Max. PV module size	90kW	120kW	150kW		
Max. PV input power	60kW	80kW	100kW		
Max. operating PV input current(per string)	8*20A d.c.				
Max. Isc PV(per string)	8*30A d.c.				
Mmax PV (Max. PV input voltage)	1000V d.c				
MPPT Voltage Range	150~850V d.c.				
PV input operating voltage range	150~950 V d.c.				
Full power MPPT voltage range	375-750V d.c	500-850V d.c	625-850V d.c		
Start-up Voltage	200V d.c				
Number of MPPT Trackers	4				
Strings per MPPT Tracker	2				
Number of PV input	8				
Max.inverter backfeed current to the array	0A				
Grid AC input and AC output					
Grid rated voltage	120 / 208 V a.c., 3W+N+PE	277/ 480 V a.c., 3W+N+PE			
Grid rated frequency	50Hz/60Hz				
Grid rated input active power	30kW	40kW	50kW	60kW	70kW
Grid rated input apparent power	30kVA	40kVA	50kVA	60kVA	70kVA
Grid Max. input active power	60kW((Grid to Load and BAT)	80kW((Grid to Load and BAT)	100kW((Grid to Load and BAT)	120kW((Grid to Load and BAT)	140kW((Grid to Load and BAT)
Grid Max. input apparent power	60kVA((Grid to Load and BAT)	80kVA((Grid to Load and BAT)	100kVA((Grid to Load and BAT)	120kVA((Grid to Load and BAT)	140kVA((Grid to Load and BAT)
Grid rated output active power	30kW	40kW	50kW	60kW	70kW
Grid rated output apparent power	30kVA	40kVA	50kVA	60kVA	70kVA

Grid Max. output active power	30kW	40kW	50kW	60kW	70kW
Grid Max. output apparent power	30kVA	40kVA	50kVA	60kVA	70kVA
Grid rated input current	83.3A a.c	48.1A a.c	60.1A a.c	72.2A a.c	84.2A a.c
Grid Max. input current	166.6A a.c	96.2A a.c	120.2A a.c	144.4A a.c	168.4A a.c
Grid rated output current	83.3A a.c	48.1A a.c	60.1A a.c	72.2A a.c	84.2A a.c
Grid Max. output current	92.6A a.c	53.5A a.c	66.8A a.c	80.2A a.c	93.6A a.c
Grid power factor	0.8 leading to 0.8 lagging				
Grid input and output Inrush current	500A a.c @ 10ms				
Max. Grid output fault current	500A a.c @ 10ms				
Max. Grid output overcurrent protection	124.9A a.c @ 0.2s	72.2A a.c @ 0.2s	90.2A a.c @ 0.2s	108.3A a.c @ 0.2s	126.3A a.c @ 0.2s
Grid input Icc (Rated conditional short-circuit current)	500A a.c				
Grid input Icw (Rated short-time withstand current)	500A a.c				
Total Harmonic Distortion(THDi, rated power)	<3%				
GEN rated input current	83.3A a.c	48.1A a.c	60.1A a.c	72.2A a.c	84.2A a.c
GEN rated input power	30kW	40kW	50kW	60kW	70kW
EPS output					
EPS rated output Voltage	120 / 208 V a.c., 3W+N+PE	277/ 480 V a.c., 3W+N+PE			
EPS rated output frequency	50Hz/60Hz				
EPS rated output active power	30kW	40kW	50kW	60kW	70kW
EPS rated output apparent power	30kVA	40kVA	50kVA	60kVA	70kVA
EPS Max. output active power	33kW	44kW	55kW	66kW	77kW
EPS Max. output apparent power	33kVA	44kVA	55kVA	66kVA	77kVA
Eps rated output current	83.3A a.c	48.1A a.c	60.1A a.c	72.2A a.c	84.2A a.c
Max. output current	91.6A a.c	52.9A a.c	66.1A a.c	79.4A a.c	92.6A a.c
EPS output power factor	0.8 leading to 0.8 lagging				
EPS output peak power	45kVA(<0.2s)	60kVA(<0.2s)	75kVA(<0.2s)	90kVA(<0.2s)	105kVA(<0.2s)
EPS output Inrush current	500A a.c @ 10ms				
EPS Max. output fault current	500A a.c @ 10ms				
EPS Max. output overcurrent protection	124.9A a.c	72.2A a.c @ 0.2s	90.2A a.c @ 0.2s	108.3A a.c @ 0.2s	126.3A a.c @ 0.2s
Switch Time	<20ms				
Total Harmonic Distortion (THDv, linear Load)	<3%				
Compatible with the Generator	Optional				

Efficiency	
MPPT Efficiency	99 .90%
Euro-efficiency	97.00%
Max.efficiency	98.00%
Standard	
Safety	UL 1741-2021 (UL1741SB), CSA C22.2 No 107.1-16
EMC	IEEE Std C37.90.2-2004,IEEE C62.45-2002,IEEE Std C62.41.2-2002,IEEE Std C37.90.1-2024
Grid-interactive	UL 1741-2021 (UL1741SA), CSA C22.2 No 107.1-16, IEEE 1547-2018 & 1547a-2020 & 1547.1-2020 (SRD V2.0), UL 1741 CRD-PCS, UL1699B, CEC, SGIP, CSIP
General Parameter	
Degree of ingress protection	IP66
Protection class	I
Environment category	Outdoor
Wet location classification	Yes
Pollution degree	PD3
Operating altitude	4000 m(>2000 Derating)
Operating ambient temperature	-25 - +60 °C (linely derating to 60% when exceed +45 to +60 °C)
Operating relative Humidity	0-100% (non-condensing)
Storage Temperature	-25- +60 °C
Storage relative Humidity	0-95% (non-condensing)
Noise Emission(typical)	<65 dB
Overvoltage Category	AC: III, PV: II
Electrical supply system	TN, TT
Dimension (WxHxD)	544*880*278mm
Net Weight	88kg
Cooling Mode	Intelligent Air Cooling
Topology	Non-isolated
Active anti-islanding method	Active frequency drift
Communication	RS485/WiFi/Bluetooth/LAN/CAN/DRM/Meter,
	Yes/ Yes/ Opt/Opt/ Yes/ Yes/ Opt
Display	LED+APP

3.4 System Diagram

Diagram Ⅰ： General System

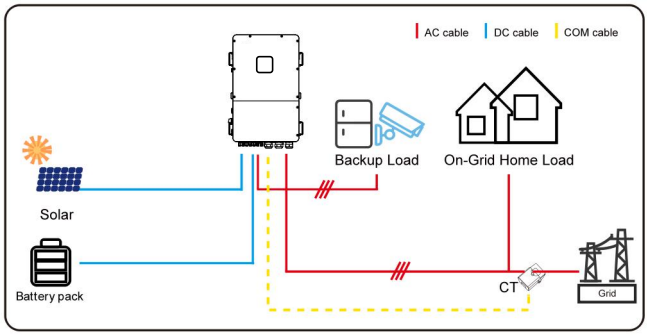
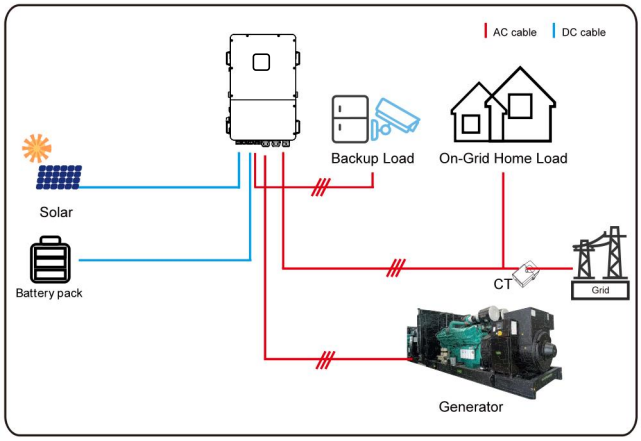


Diagram Ⅱ： System With Generator



DiagramⅢ：System With Smart Load

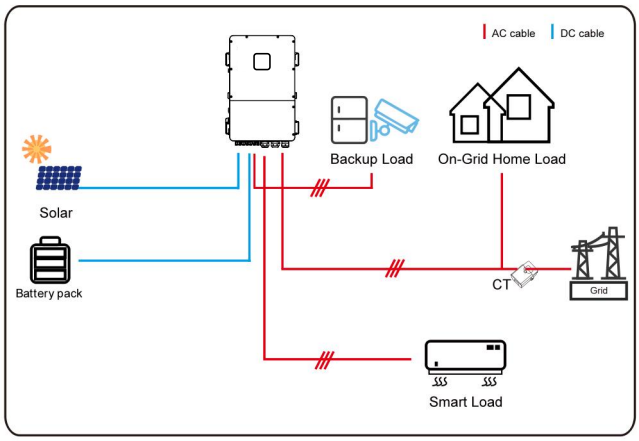
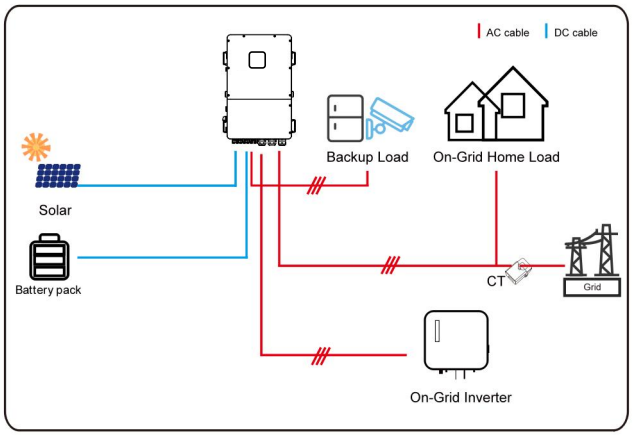


Diagram Ⅳ： AC Couple System



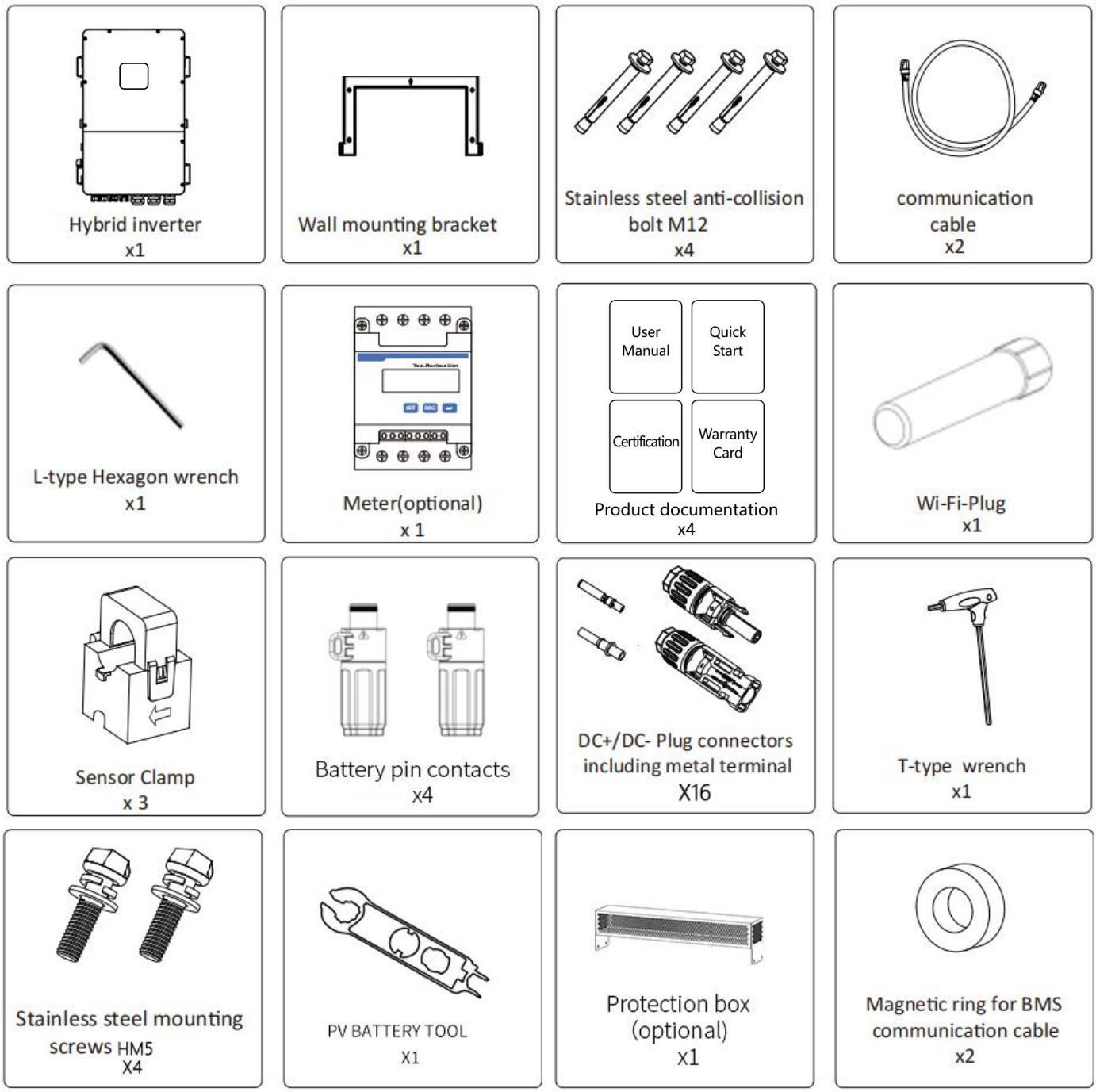
4. Check and Storage

4.1 Check Before Receiving

Check the following items before receiving the product.

1. Check the outer packing box for damage, such as holes, cracks, deformation, and others signs of equipment damage. Do not unpack the package and contact the supplier as soon as possible if any damage is found.
2. Check the inverter model. If the inverter model is not what you requested, do not unpack the product and contact the supplier.
3. Check the deliverable for correct model, complete contents, and intact appearance. Contact the supplier as soon as possible if any damage is found.

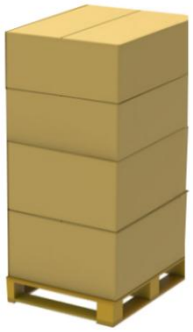
4.2 What's in the box?



4.3 Storage

If the equipment is not to be installed or used immediately, please ensure that the storage environment meets the following requirements:

1. Do not unpack the outer package or throw the desiccant away.
2. Store the equipment in a clean place. Make sure the temperature and humidity are appropriate and no condensation.
3. The height and direction of the stacking inverters should follow the instructions on the packing box.
4. The inverters must be stacked with caution to prevent them from falling.
5. If the inverter has been long term stored, it should be checked by professionals before being put into use.
6. The storage temperature range is: -25℃~60℃, and the storage humidity is 0~100%.
7.The box should be suitable for loads more than 75kg.



5.Installation

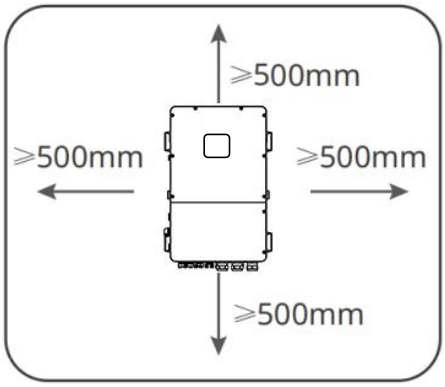
5.1 Installation Requirements

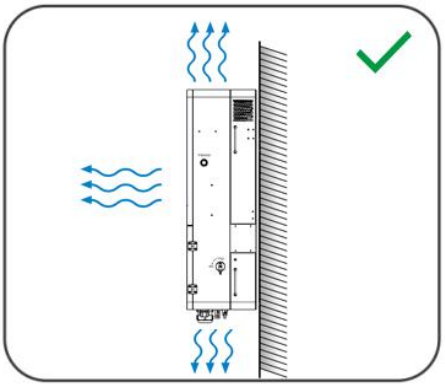
Installation Environment Requirements

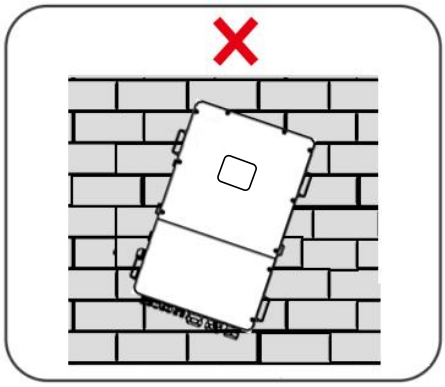
1. Do not install the equipment in a place near flammable, explosive, or corrosive materials.
2. Do not install the equipment in a place that is easy to touch, especially within children's reach. High temperature exists when the equipment is working. Do not touch the surface to avoid burning.
3. Avoid the water pipes and cables buried in the wall when drilling holes.
4. Install the equipment in a sheltered place to avoid direct sunlight, rain, and snow. Build a sunshade if it is needed.
5. The place to install the equipment shall be well-ventilated for heat radiation and large enough for operations.
6. The equipment with a high ingress protection rating can be installed indoors or outdoors. The temperature and humidity at the installation site should be within the appropriate range.
7. Install the equipment at a height that is convenient for operation and maintenance, electrical connections, and checking indicators and labels.
8. The altitude to install the inverter shall be lower than the maximum working altitude 4000m.
9. The PV modules used with the inverter must have an IEC61730 class A rating.
10. There should be provided an over current protection (such as a breaker rated 400V a.c /32 A a.c) before AC input and after EPS output, and make sure that the installation position shall not prevent access to the disconnection means.
11. Please ensure that there is adequate ventilation space for the inverter after installation, refer to the installation diagram below.
12. This inverter does not provide an internal isolated transformer between PV input and Battery / AC output circuits, But a basic insulation is provided between PV input / Battery / AC output circuits and metal enclosure / earth, and reinforced / double insulation between PV input / Battery / AC output and communication circuits (DRM / Meter / WiFi/ RS485)
13. The PV input ratings please refer to the specification table of subclause 3.3.5, and please make sure that PV array should not be grounded.
14. Install the equipment away from electromagnetic interference. If there are radio stations or wireless communication equipment below 30 MHz near the installation location, please install the equipment as follows:

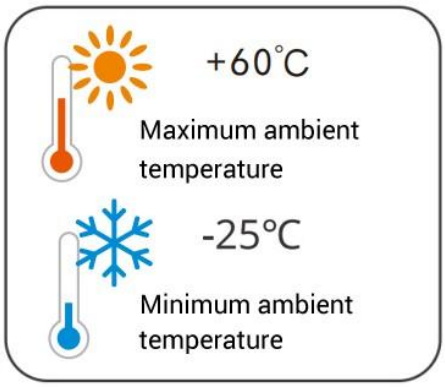
• Add a multi-turn winding ferrite core at the DC input line or AC output line of the inverter, or add a low-pass EMI filter.
• The distance between the inverter and the wireless EMI equipment is more than 30m.

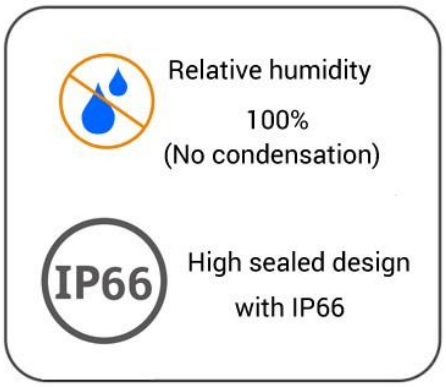
15. In lightning-prone areas, please install proper surge protection devices (SPDs) at PV, grid, and load terminals, and ensure r eliable grounding. Damage caused by lightning is not covered under warranty—adequate lightning protection is strongly reco mmended.

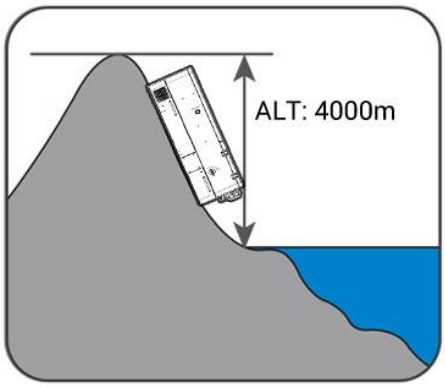

≥500mm
≥500mm
≥500mm
≥500mm



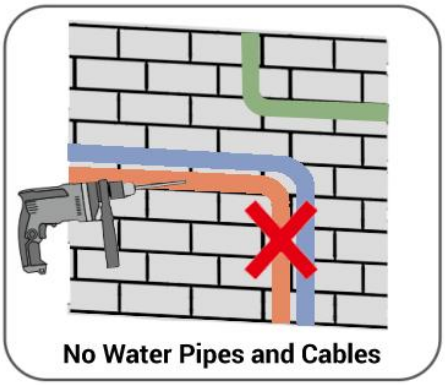


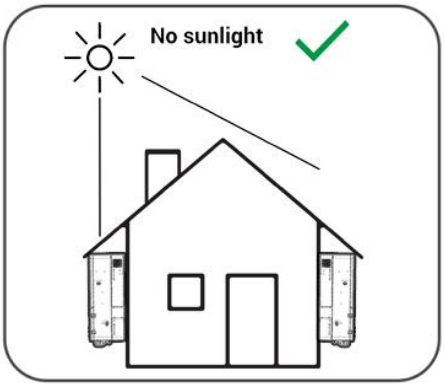

+60°C
Maximum ambient temperature
-25°C
Minimum ambient temperature

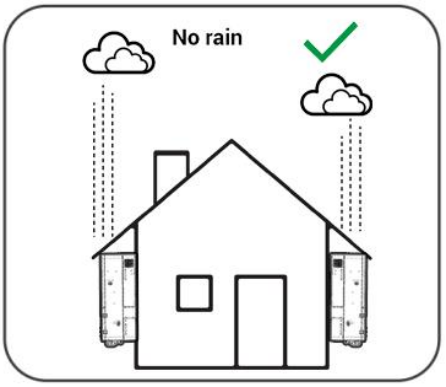

Relative humidity
100%
(No condensation)
IP66
High sealed design with IP66

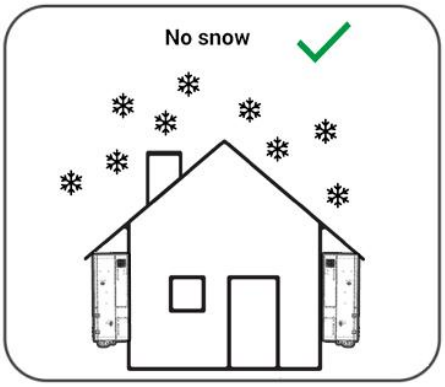

ALT: 4000m

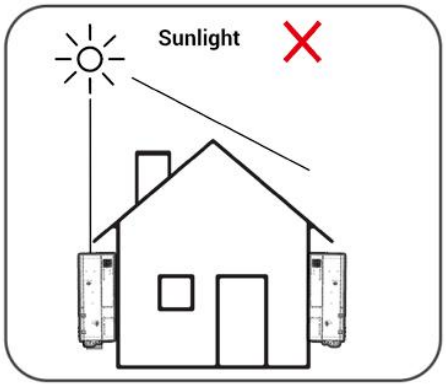
Children No Reach

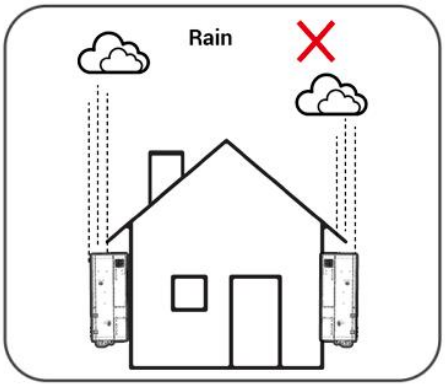

No Water Pipes and Cables

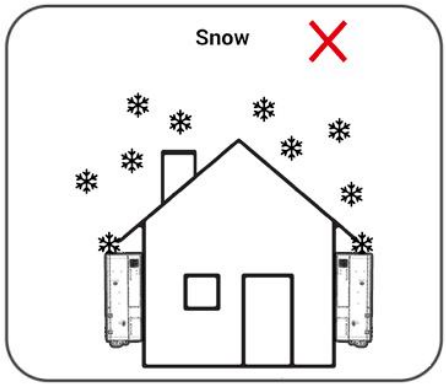

No sunlight


No rain


No snow

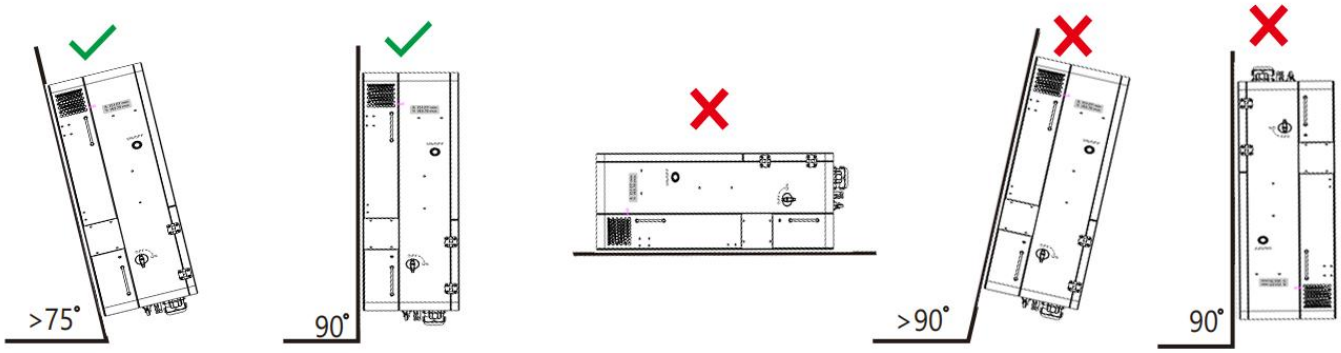

Sunlight


Rain


Snow

Installation Angle Requirements

- Install the inverter vertically or at a maximum back tilt of 15 degrees.
- Do not install the inverter upside down, forward tilt, back forward tilt, or horizontally.



Installation Tool Requirements

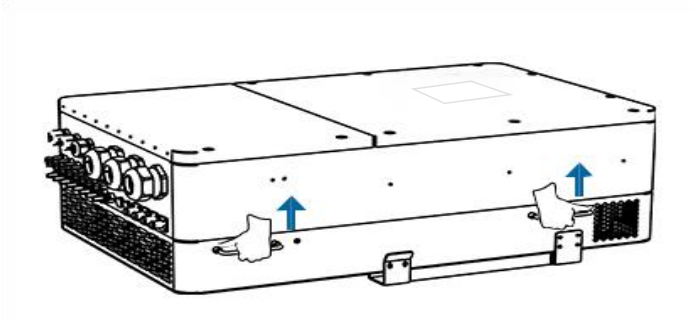
The following tools are recommended when installing the equipment. Use other auxiliary tools on site if necessary.

5.2 Inverter Installation

5.2.1 Moving the Inverter

CAUTION

- The unit is heavy. Do not lift it alone During lifting procedures ensure that the unit is firmly secured to avoid the risk of accidental tipping or dropping.Parts serving for support or immobilization of unit shall be designed and manufactured so as to minimize the risk of physical injuries and of accidental loosening of fixing.Ensure that the method of lifting will not allow the unit to slip from chains and slings or turn-over or slide from lifting devices.



transport

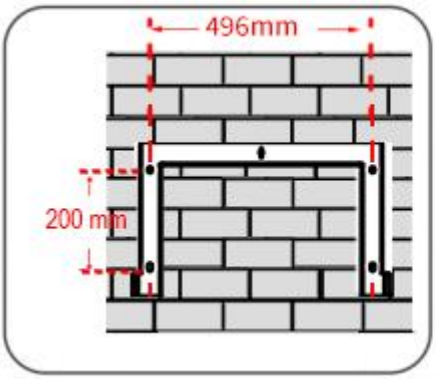
- Transportation must be carried by specialized person (truck operators. Hook-up personal), equipped with the necessary protection equipment(overalls, safe shoes, protective gloves, helmets, goggles)
- Do not walk or stand beneath or in the proximity of the load.Avoid sudden movements and jolts when unloading and positioning the unit, Internal handling procedures must be conducted with care.
- Do not exert leverage on the components of the machine.If the unit is not balanced apply ballast, Any protruding parts should not be supported by hand. The inverter should be installed so that the operating panel shall be easily accessible- easy access to the electrical power connection point.
- Accessible for maintenance and repair work. Parts serving for support or immobilization of unit shall be designed and manufactured so as to minimize the risk of physical injuries and accidental loosening of fixings.
- Loading capacity and hardness of the supporting surface,load rating of mounting bracket should be at least four times the weight of the devices according to IEC62109-1. And supporting characteristics will be impaired by wear, corrosion, material fatigue or ageing, This should be calculated by inspection of the design data of supporting material and consulting construction engineer.

5.2.2 Installing Steps

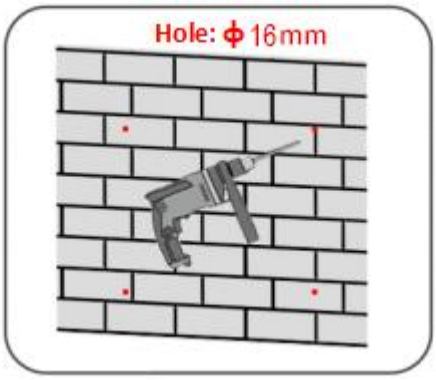
NOTICE

- Avoid the water pipes and cables buried in the wall when drilling holes.
- Wear goggles and a dust mask to prevent the dust from being inhaled or contacting eyes when drilling holes.
- Make sure the inverter is firmly installed in case of falling down.

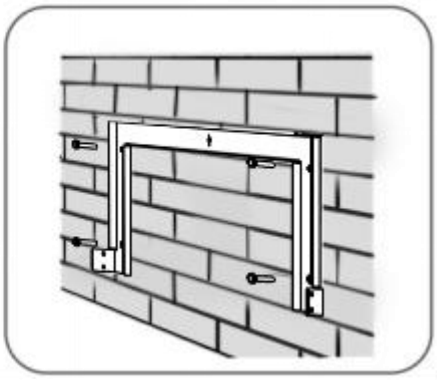
Step 1 : Put the mounting plate on the wall or the support horizontally and mark positions for drilling holes.
Step 2 : Drill holes to a depth of 80mm using the hammer drill. The diameter of the drill bit should be 13mm.
Step 3 : Secure the mounting plate using the expansion bolts.
Step 4 : Install the inverter on the mounting plate.
Step 5: Make sure the pin hook the inverter
Step 6 : Install the screw to lock it tight.



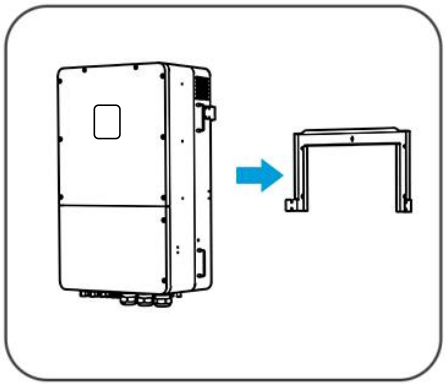
Step 1



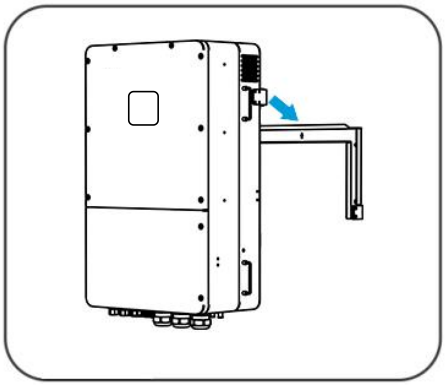
Step 2



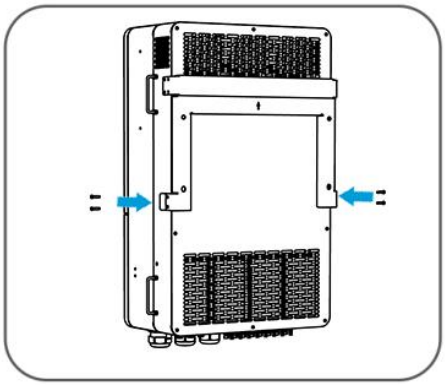
Step 3



Step 4



Step 5



Step 6

6.Electrical Connection

6.1 Safety Precaution

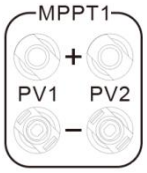
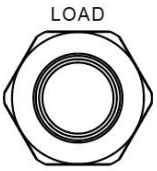
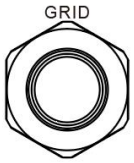
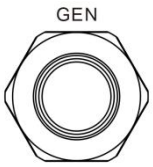
DANGER

- All operations, cables and parts specification during the electrical connection shall be in compliance with local laws and regulations.
- Disconnect the DC switch and the AC output switch of the inverter to power off the inverter at lest 5 minutes for the capacitor to be electrically discharged before any electrical connections. Do not work with power on. Otherwise, an electric shock may occur.
- Tie the same type cables together, and place them separately from cables of different types. Do not place the cables entangled or crossed.
- If the cable bears too much tension, the connection may be poor. Reserve a certain length of the cable before connecting it to the inverter cable port.
- When crimping the terminals, ensure that the conductor part of the cable is in full contact with the terminals. Do not crimp the cable jacket with the terminal. Otherwise the inverter may not operate, or its terminal block getting damaged due to heating and other phenomenon because of unreliable connection after operation.

NOTICE

- Wear personal protective equipment like safety shoes, safety gloves, and insulating gloves during electrical connections.
- All electrical connections should be performed by qualified professionals.
- Cable colors in this document are for reference only. The cable specifications shall meet local laws and regulations.

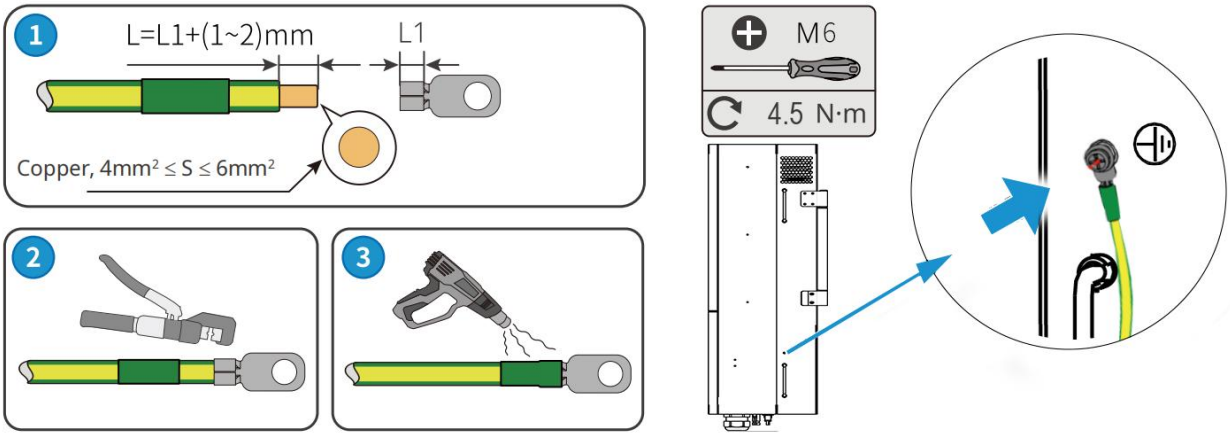
6.2 Connection Port Description

Connector	Description		Recommend cable type	Recommended Cable specifications
	+：Connect the positive electrode of photovoltaic cell		Industry common outdoor Photovoltaic cable	Conductor cross-sectional area: 4mm^2(10AWG)
	-：Connect the negative electrode of photovoltaic cell			
	+：Connect the positive electrode of lithium battery		Outdoor multi-core copper cable	Conductor cross-sectional area:21.5mm^2(4AWG)
	-：Connect the negative electrode of lithium battery			
	Load(EPS)	L1	Outdoor multi-core copper cable L1/L2/L3: Brown/Red/Green or Yellow Wire N: Blue/Black Wire PE: Yellow & Green Wire	Conductor cross-sectional area:25mm^2(2AWG)
		L2		
		L3		
		N		
		PE		
	Grid(AC)	L1	Outdoor multi-core copper cable L1/L2/L3: Brown/Red/Green or Yellow Wire N: Blue/Black Wire PE: Yellow & Green Wire	Conductor cross-sectional area:95mm^2(0AWG)
		L2		
		L3		
		N		
		PE		
	Generator	L1	Outdoor multi-core copper cable L1/L2/L3: Brown/Red/Green or Yellow Wire N: Blue/Black Wire PE: Yellow & Green Wire	Conductor cross-sectional area:25mm^2(2AWG)
		L2		
		L3		
		N		
		PE		
	WiFi			

6.3 PE Cable Connection

WARNING

- The PE cable connected to the enclosure of the inverter cannot replace the PE cable connected to the AC output port. Both of the two PE cables must be securely connected
- Make sure that all the grounding points on the enclosures are equipotential connected when there are multiple inverters.
- To improve the corrosion resistance of the terminal, it is recommended to apply silica gel or paint on the ground terminal after installing the PE cable.
- Prepare PE cables with the recommended specification:
- Type: Outdoor single-core copper wire
- Cross-sectional area: 6mm^2(10AWG)



6.4 PV Connection

6.4.1 PV String Connection

DANGER

Confirm the following information before connecting the PV string to the inverter. Otherwise, the inverter may be damaged permanently or even cause fire and cause personal and property losses.

1. Make sure that the max short circuit current and the max input voltage per MPPT are within the permissible range.
2. Make sure that the positive pole of the PV string connects to the PV+ of the inverter. And the negative pole of the PV string connects to the PV - of the inverter.

Model for US	SSE-HH30K-P3US-S	SSE-HH40K-P3US-S	SSE-HH50K-P3US-S	SSE-HH60K-P3US-S	SSE-HH70K-P3US-S
Max. DC Voltage	1000V d.c				
MPPT Voltage Range	150V-850V d.c				

WARNING

1-Please choose a suitable external DC switch if the inverter does not have a built-in DC switch.

2-PV module voltage is very high and within a dangerous voltage range, please comply with the electric safety rules when connecting

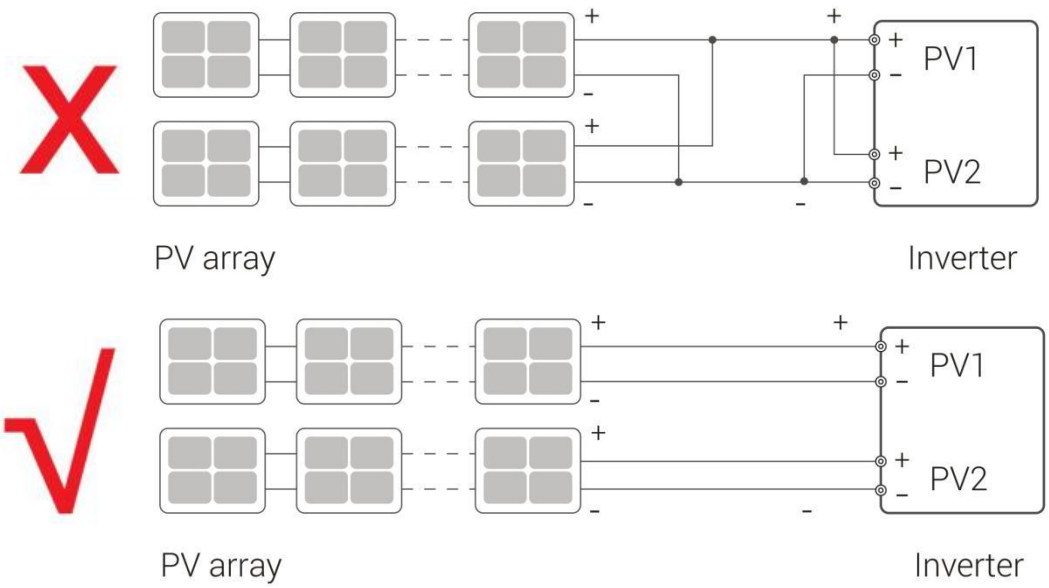
3-Please **DO NOT** make PV positive or negative to ground.

4-PV modules: Please ensure they are the same type, have the same output and specifications,are aligned identically, and are tilted to the same angle. In order to save cable and reduce DC loss, we recommend installing the inverter as near to the PV modules as possible.

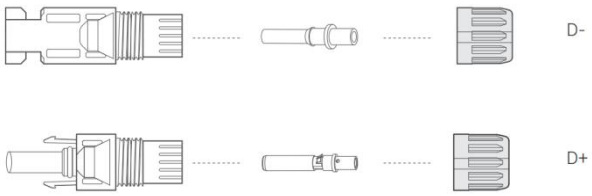
NOTICE

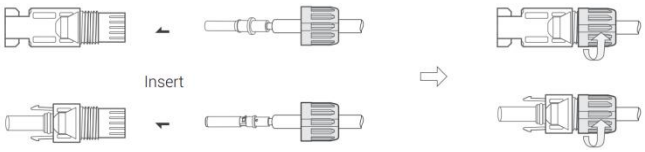
The DC input cable is prepared by the customer. Recommended specifications:

- Type: the outdoor photovoltaic cable that meets the maximum input voltage of the inverter.
- Conductor cross-sectional area: 2.5~4mm^2 (Devalan) or 4~6mm^2 (MC4).



6.4.2 PV Wiring

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

Step 3: Wiring 1. Connect the 10 AWG wire to the cold crimp terminal. 2. Remove 10mm of insulation from the end of the wire. 3. Insert the insulator into the pin contact and clamp it with crimping pliers.	
	Step 4: Insert the pin contact through the nut and into the male or female plug, when a "click" is felt or heard, the pin contact assembly is properly seated. Then tighten the nut.
Step 5: Plug the PV connector into the corresponding interface on the inverter.	

6.5 EPS and Grid,Generator Connection

NOTICE

SSE-HH30-70K-P3US-S series inverters are designed for three-phase grid.;frequency is 50/60Hz. Other technical requests should comply with the requirement of the local public grid.

WARNING

•Before connecting to the grid, a separate AC breaker must be installed between the inverter and the grid, and also between the backup load and the inverter.This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current. For the 30/40/50/60/70kW model, the recommended Ac breaker for backup load is 240A. For the 30/40/50/60/70kW model, the recommended Ac breaker for grid is 240A. any load SHOULD NOT be connected with the inverter directly.

•There are three terminal blocks with "Grid" "Load"and "GEN" markings. Please do not misconnect input and output connectors.

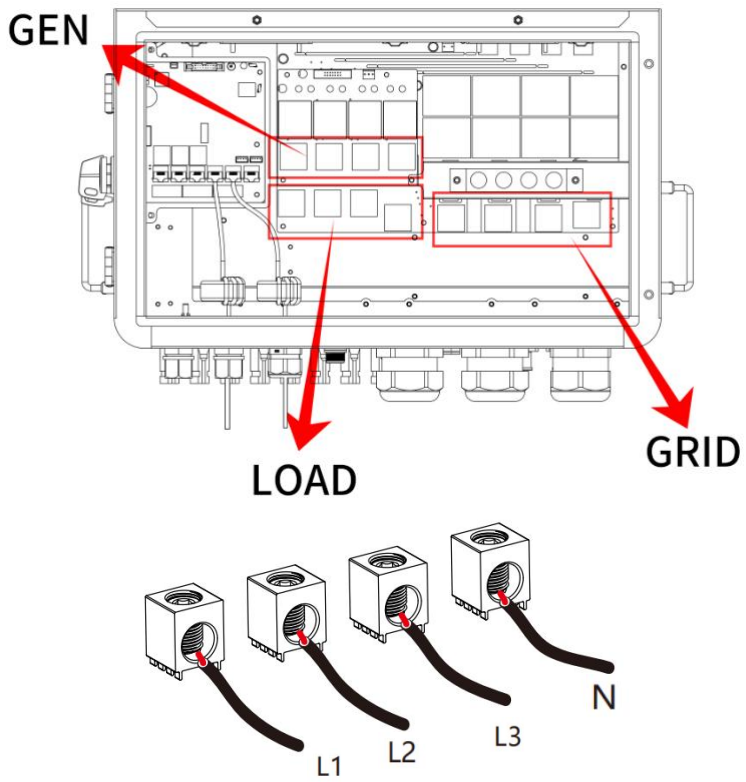
NOTICE

Check the grid voltage and compare with the permitted voltage range (refer to technical data).

- Disconnect the circuit-breaker from all the phases and secure against re-connection.
- Please follow below steps to implement Grid, load and Gen port connection:

- Please refer to local cable type and color for actual installation.
- Cross-sectional area: 25mm^2(2AWG)

6.5.1 Wiring(as shown in picture)



6.6 Battery Connection

DANGER

- The battery used with the inverter shall be approved by the inverter manufacturer. The approved battery list can be obtained through the official website.
- A short circuit in the battery may cause personal injury. The instantaneous high current caused by a short circuit can release a large amount of energy and may cause a fire.
- Before connecting the battery cable, ensure the inverter and the battery, and downstream&upstream switches, are all disconnected.
- It is forbidden to connect and disconnect the battery cables when the inverter is running. Otherwise it may cause electric shock.
- Do not connect one battery pack to more than one inverter at the same time. Otherwise, it may cause damage to the inverter.
- It is forbidden to connect loads between the inverter and batteries.
- When connecting battery cables, use insulated tools to prevent accidental electric shock or short circuit to the batteries.
- Ensure that the open circuit voltage of the battery is within the permissible range of the inverter.
- Install a DC switch between the inverter and the battery

WARNING

- Please use approved DC cable for battery system.
- Connect the battery cables to the corresponding terminals such BAT+, BAT- and grounding ports correctly. Otherwise it will cause damage to the inverter.
- Ensure that the whole cable cores are inserted into the terminal holes. No part of the cable core can be exposed.
- Ensure that the cables are connected securely. Otherwise it will cause damage to the inverter due to overheat during its operation.

• Servicing of batteries should be performed or supervised by personnel knowledgeable about batteries and the required precautions.

• When replacing batteries, replace with the same type and number of batteries or battery packs.

• Do not dispose of batteries in a fire. The batteries may explode.

• Do not open or damage batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.

• A battery can present a risk of electrical shock and high short-circuit current. The following precautions should be observed when working on batteries:

a) Remove watches, rings, or other metal objects.

b) Use tools with insulated handles.

c) Wear rubber gloves and boots.

d) Do not lay tools or metal parts on top of batteries.

e) Disconnect charging source prior to connecting or disconnecting battery terminals.

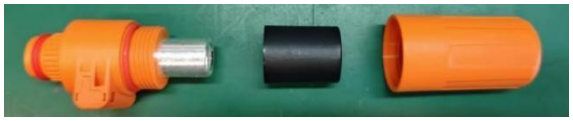
f) Determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit)

NOTICE

Battery breaker

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

Connection steps:

• Turn off the PV and battery switch . • Choose 4 AWG wire to connect the battery. • Trim 16.5mm of insulation from the wire end.	
	• Separate the DC connector (Battery) as below.
•Insert striped cable into pin contact and ensure all conductor strands are captured in the pin contact. • Crimp pin contact by using a crimping plier. Put the pin contact with striped cable into the corresponding crimping pliers and crimp the contact.	
	• Insert to the inverter battery port (BAT+/-)

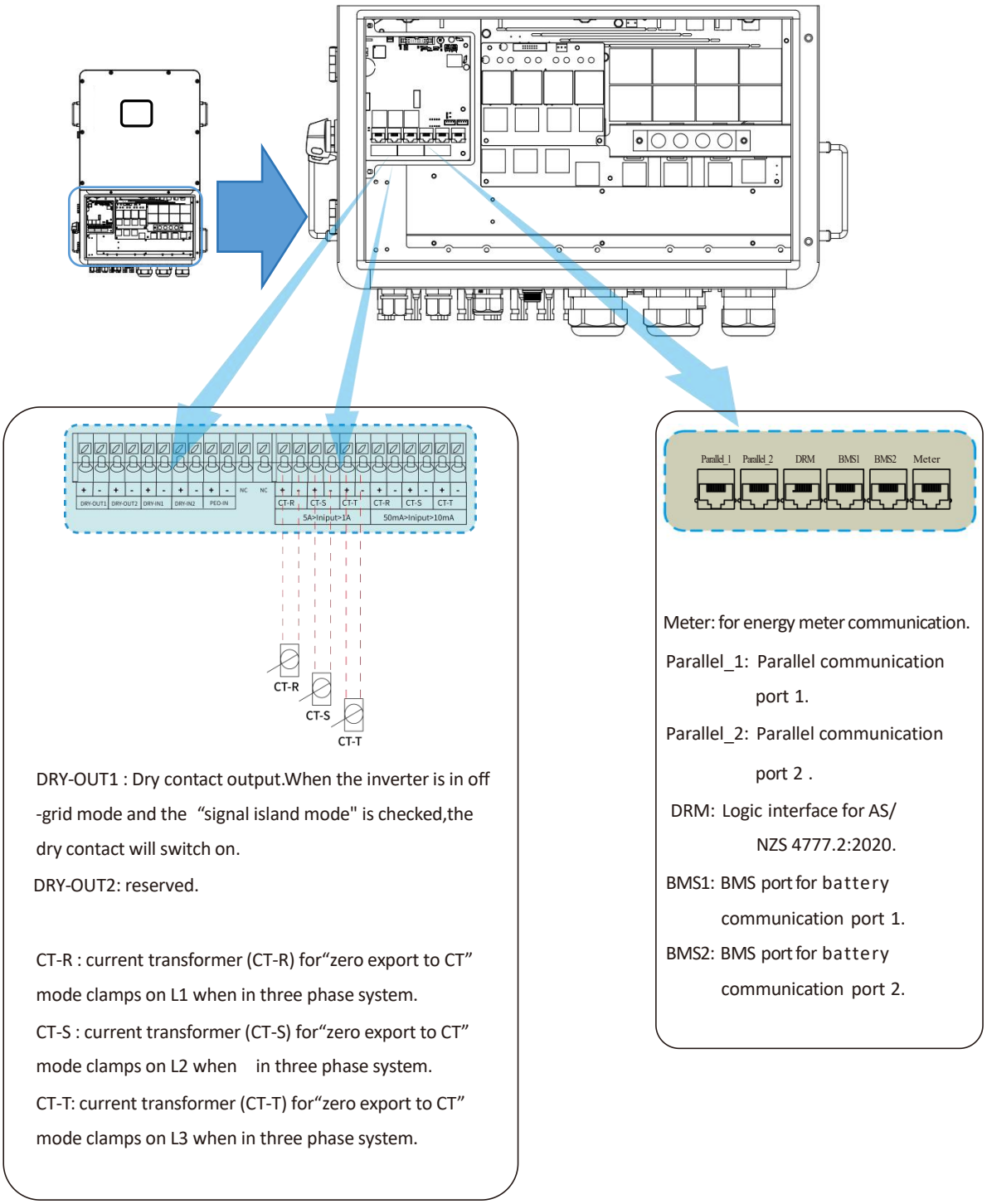
6.7 Communication Cable Installation

NOTICE

The SSE-HH30-70K-P3US-S series inverter are available with multiple communication options such as WiFi,Bluetooth, RS485 and Meter with an external device.

Operating information like output voltage, current, frequency, fault information, etc., can be monitored locally or remotely and cellphone App via these interfaces.

6.7.1 Communication Ports



DRY-OUT1 : Dry contact output.When the inverter is in off -grid mode and the "signal island mode" is checked,the dry contact will switch on.

DRY-OUT2: reserved.

CT-R : current transformer (CT-R) for"zero export to CT" mode clamps on L1 when in three phase system.

CT-S : current transformer (CT-S) for"zero export to CT" mode clamps on L2 when in three phase system.

CT-T: current transformer (CT-T) for"zero export to CT" mode clamps on L3 when in three phase system.

Meter: for energy meter communication.

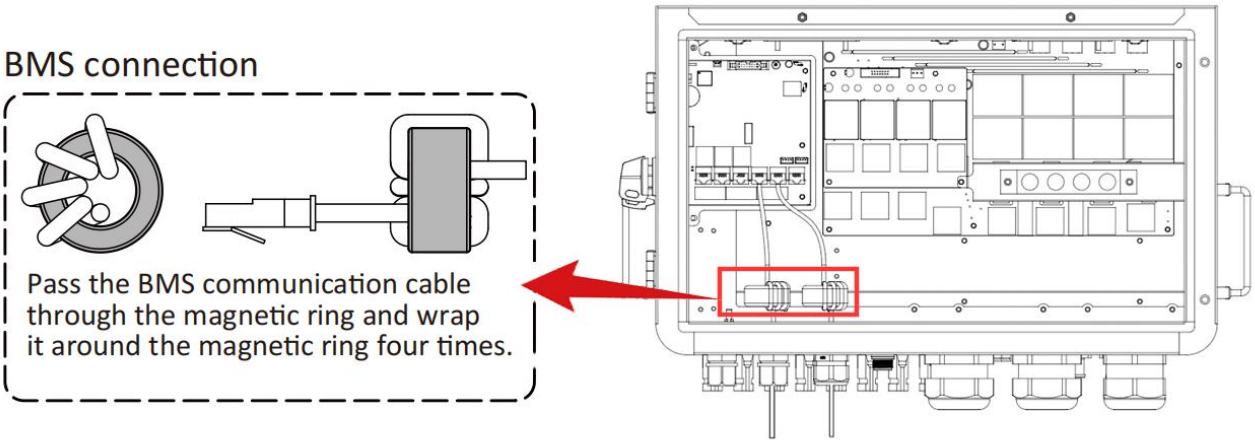
Parallel_1: Parallel communication port 1.

Parallel_2: Parallel communication port 2 .

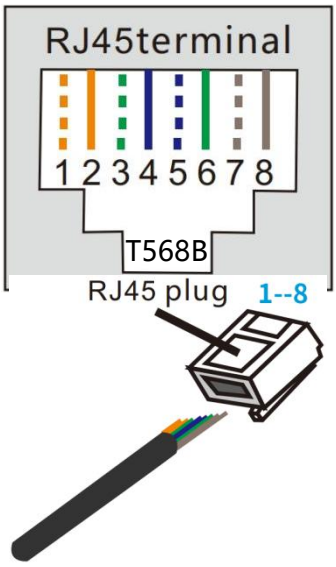
DRM: Logic interface for AS/ NZS 4777.2:2020.

BMS1: BMS port for battery communication port 1.

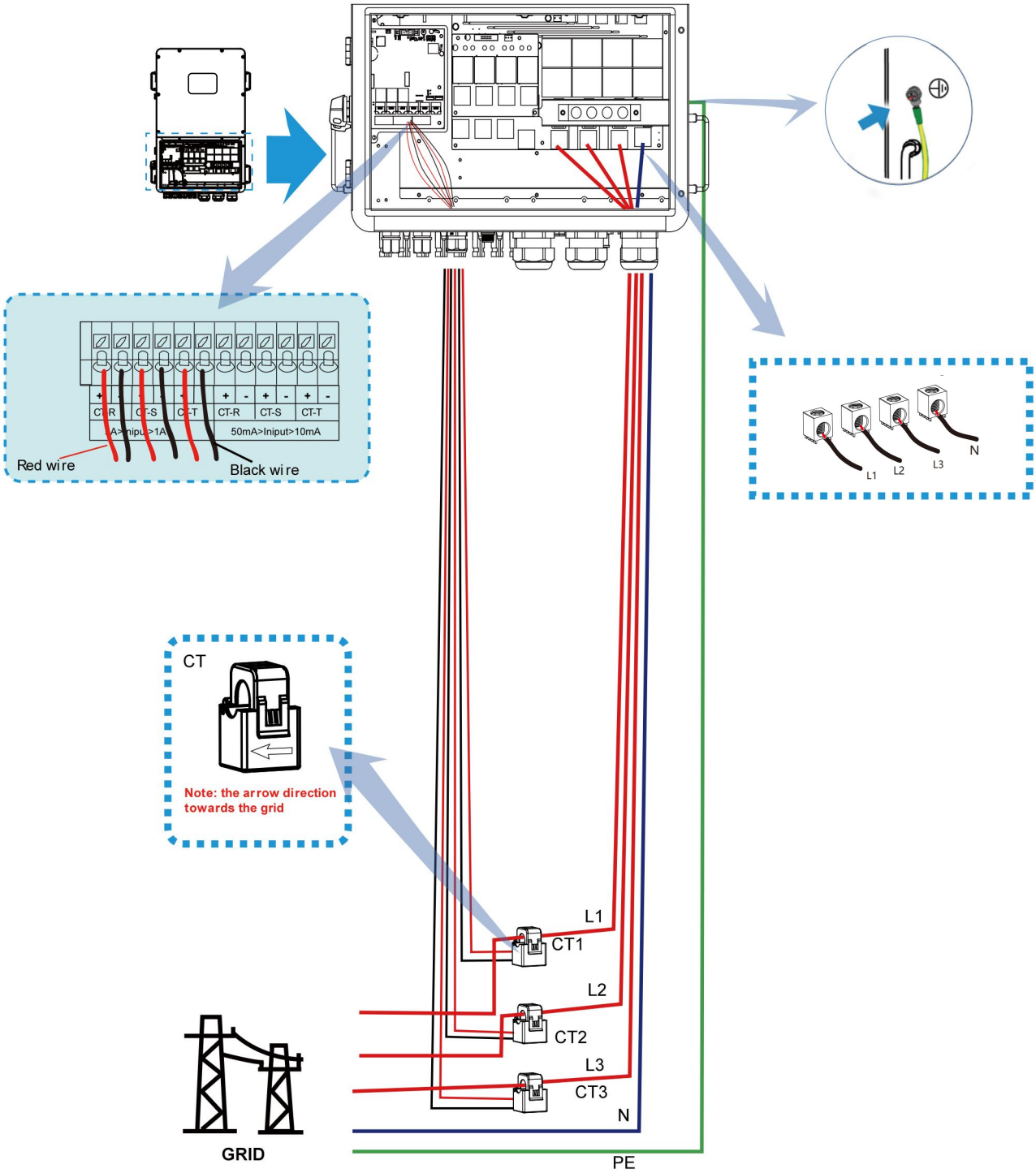
BMS2: BMS port for battery communication port 2.



PIN	Meter	BMS RJ45	PARA1/2	DRM
1	Meter RS485A	Lead-acid cell NTC	Para Display CAN_H	DRM1/5
2	Meter RS485B	GND	Para Display CAN_L	DRM2/6
3	/	/	/	DRM3/7
4	5V_VCC	BMS_CAN1_H	Para Power CAN1_H	DRM4/8
5	FR_ALM_IN	BMS_ CAN1_L	Para Power CAN1_L	REFGEN
6	GND	GND	/	COM/DRM0
7	AFCI_485A	BMS_485A	Para Power CAN2_ H	+12VS
8	AFCI_485B	BMS_485B	Para Power CAN2_L	GND

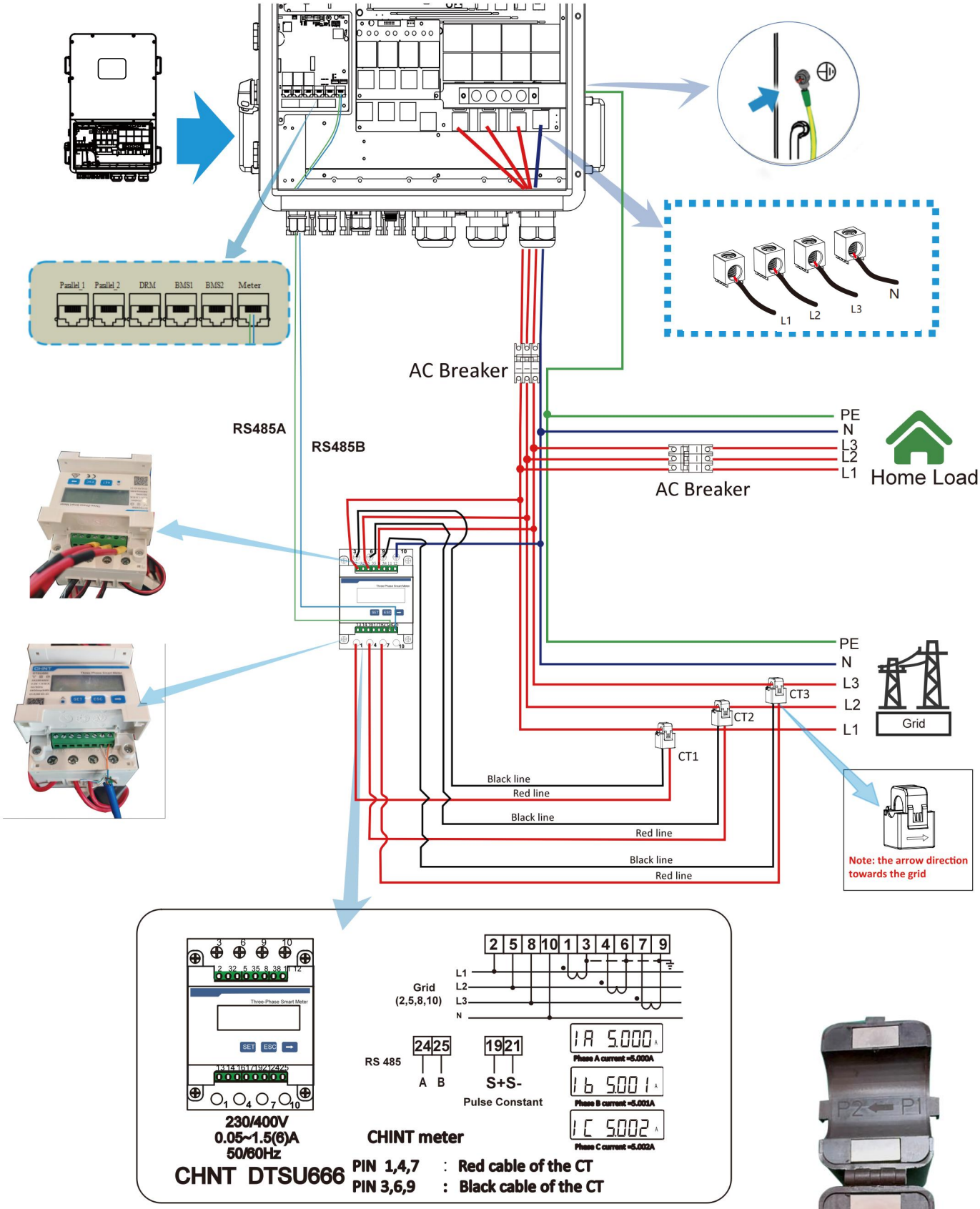


6.8 CT Connection



*Note：when the reading of the load power on the APP is not correct, please reverse the CT arrow.

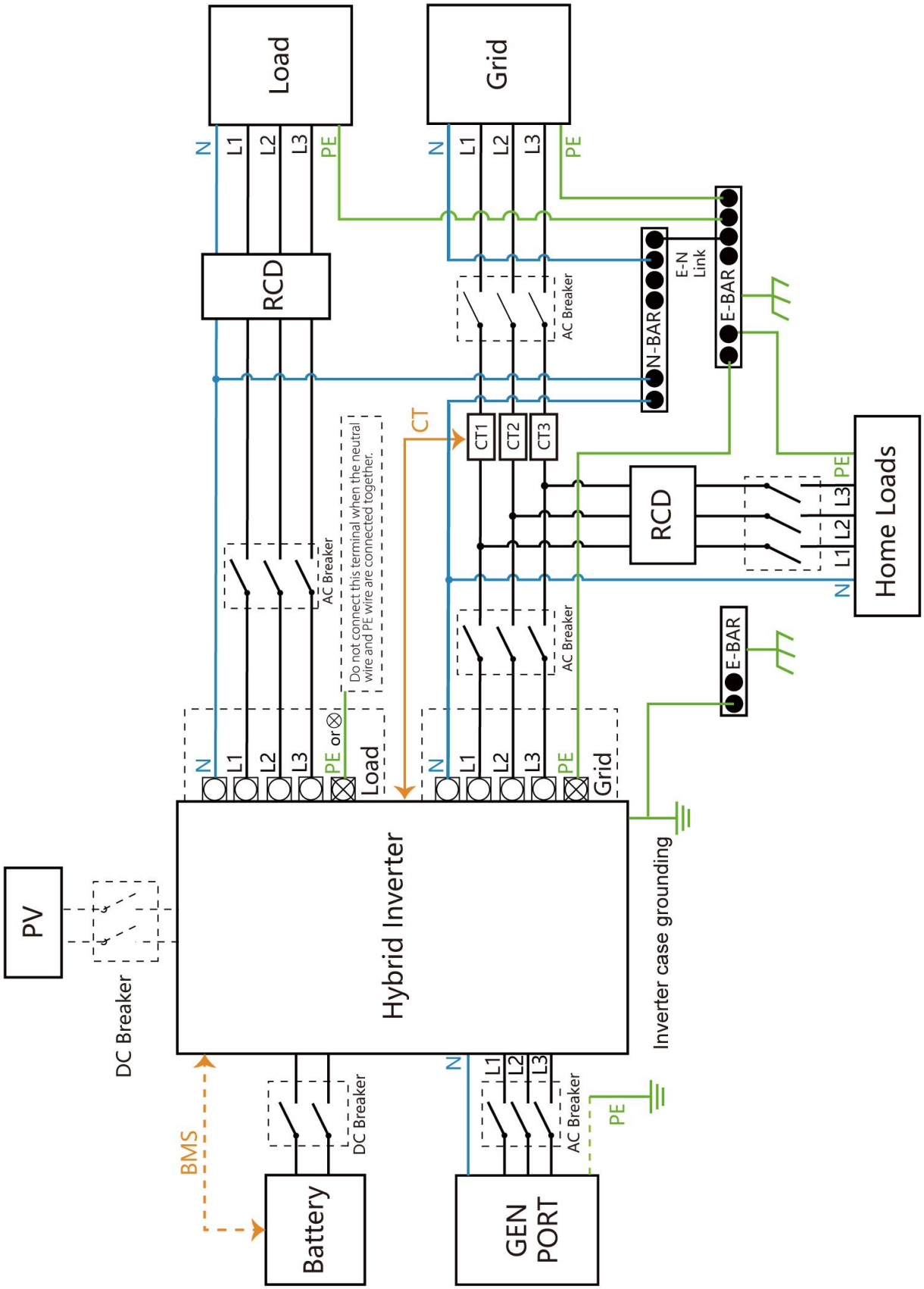
6.9 Meter Connection



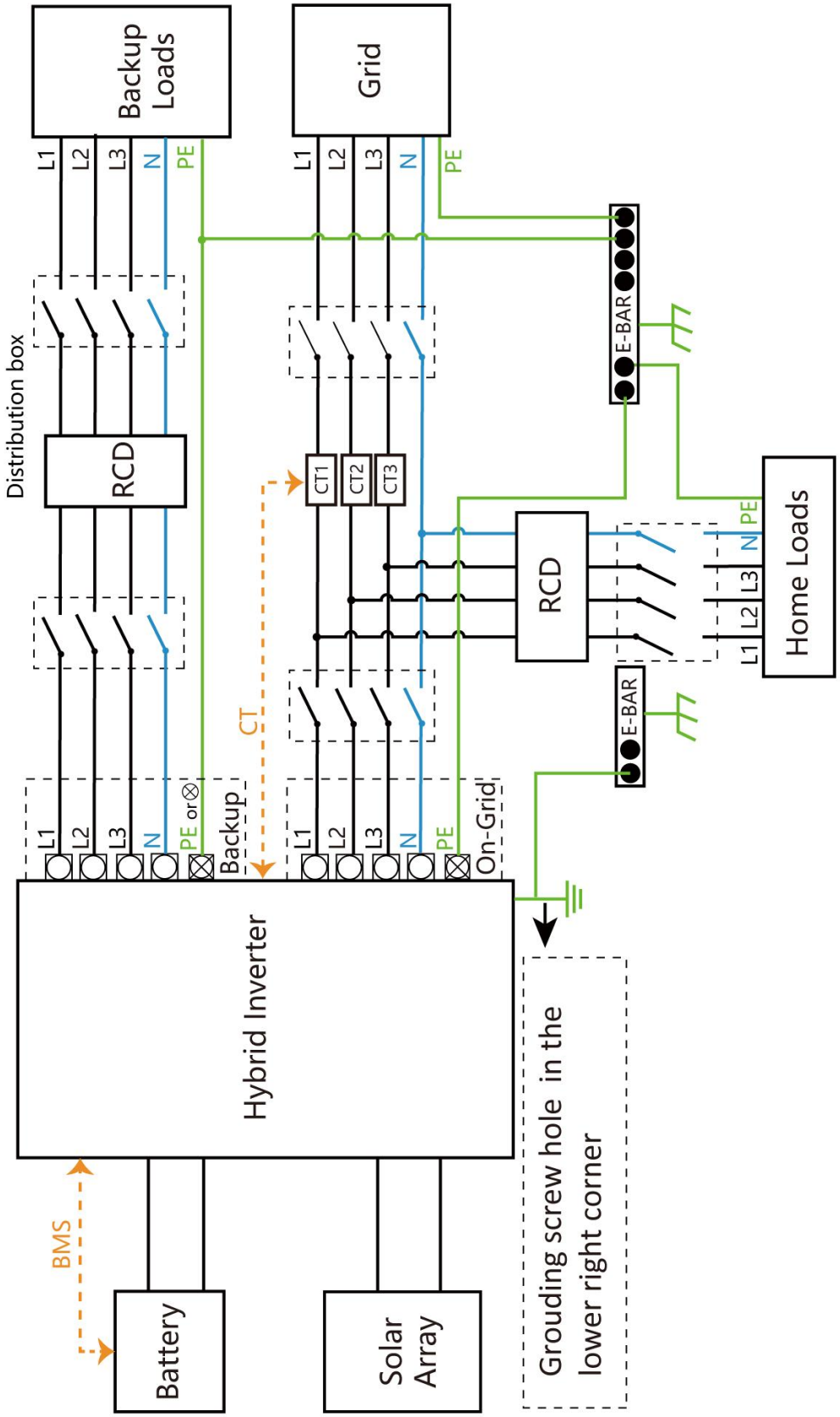
6.10 Wiring System for Inverter

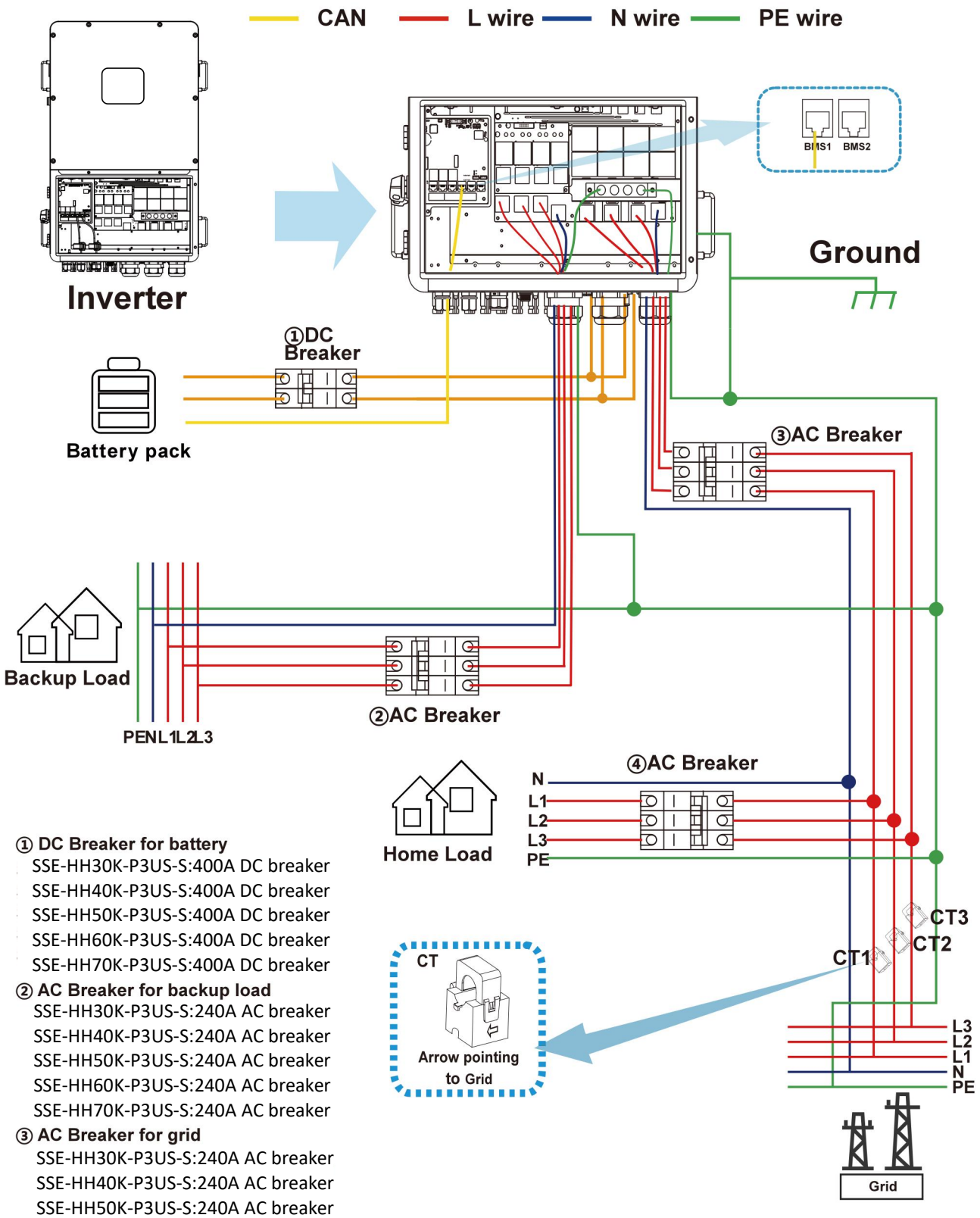
This diagram is an example for an application that neutral connects with the PE in a distribution box.

For countries such as Australia, New Zealand, South Africa, etc., please follow local wiring regulations!



This diagram is an example for an application in which neutral is separated from the PE in the distribution box. For countries such as China, Germany,the Czech Republic, Italy, etc., please follow local wiring regulations!





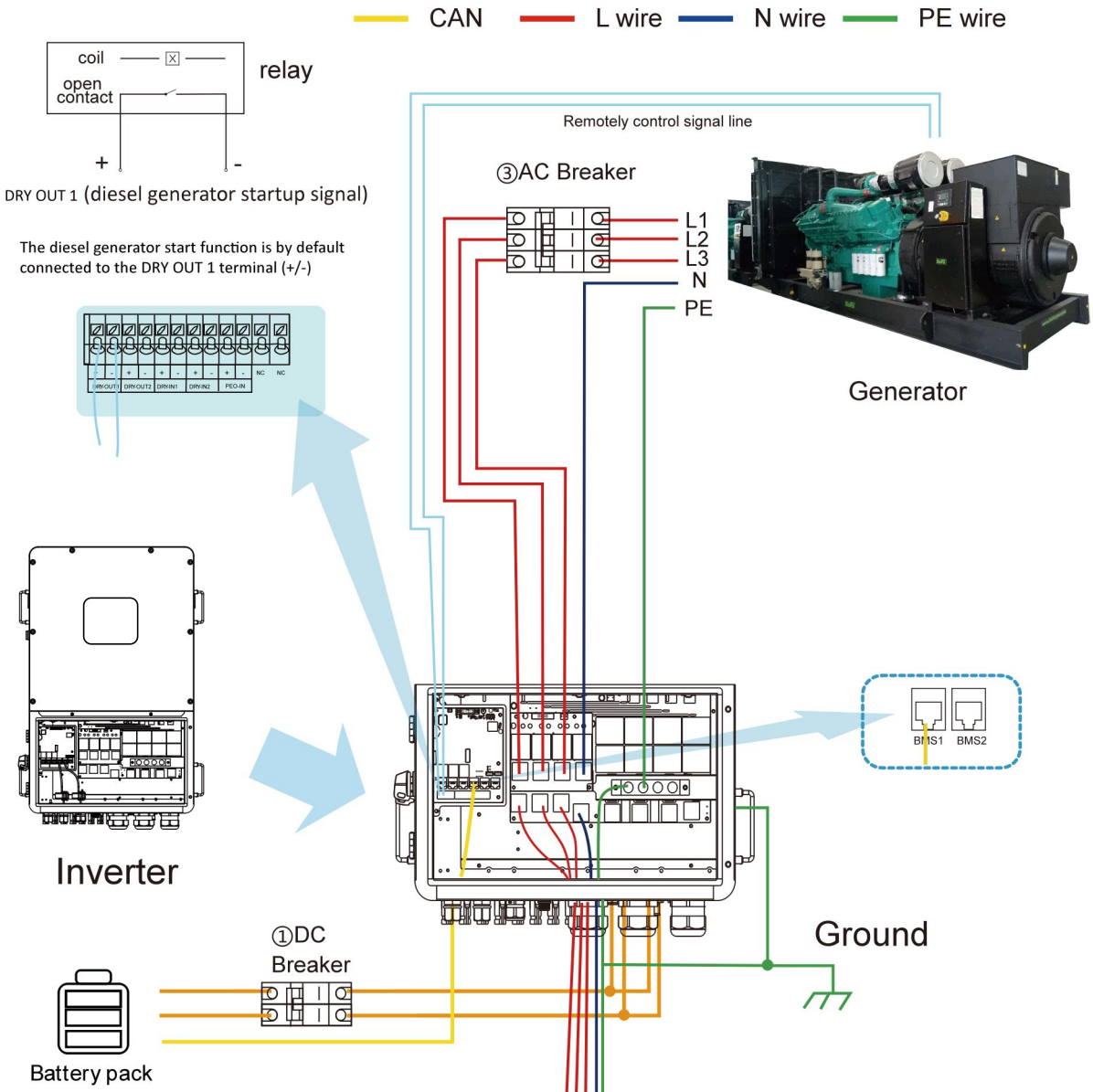
① DC Breaker for battery
- SSE-HH30K-P3US-S:400A DC breaker
- SSE-HH40K-P3US-S:400A DC breaker
- SSE-HH50K-P3US-S:400A DC breaker
- SSE-HH60K-P3US-S:400A DC breaker
- SSE-HH70K-P3US-S:400A DC breaker

② AC Breaker for backup load
- SSE-HH30K-P3US-S:240A AC breaker
- SSE-HH40K-P3US-S:240A AC breaker
- SSE-HH50K-P3US-S:240A AC breaker
- SSE-HH60K-P3US-S:240A AC breaker
- SSE-HH70K-P3US-S:240A AC breaker

③ AC Breaker for grid
- SSE-HH30K-P3US-S:240A AC breaker
- SSE-HH40K-P3US-S:240A AC breaker
- SSE-HH50K-P3US-S:240A AC breaker
- SSE-HH60K-P3US-S:240A AC breaker
- SSE-HH70K-P3US-S:240A AC breaker

④AC Breaker for home load
Depends on household loads

6.11 Wiring System for Diesel Generator



① DC Breaker for battery

SSE-HH30K-P3US-S:400A DC breaker
SSE-HH40K-P3US-S:400A DC breaker
SSE-HH50K-P3US-S:400A DC breaker
SSE-HH60K-P3US-S:400A DC breaker
SSE-HH70K-P3US-S:400A DC breaker

② AC Breaker for backup load

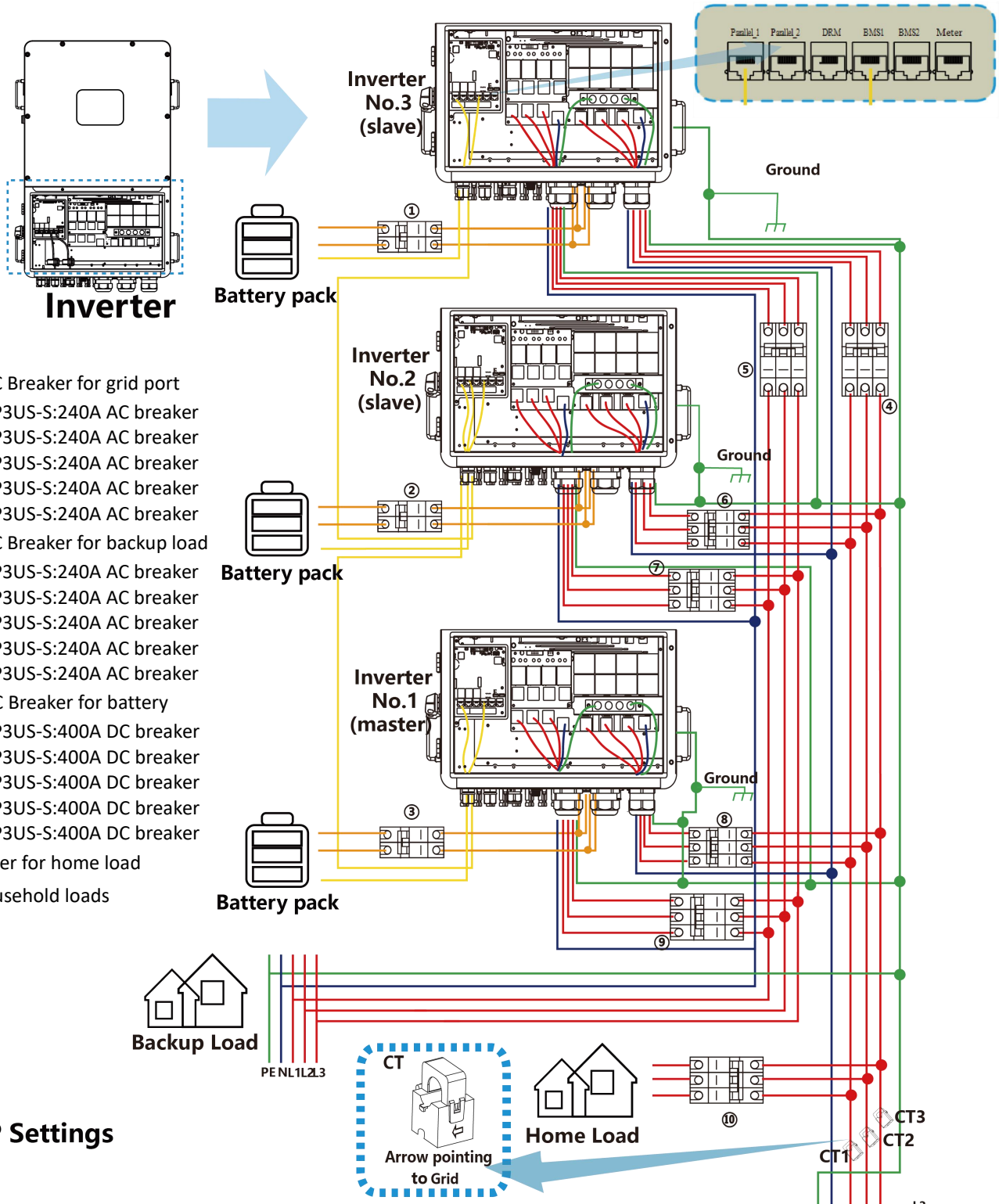
SSE-HH30K-P3US-S:240A AC breaker
SSE-HH40K-P3US-S:240A AC breaker
SSE-HH50K-P3US-S:240A AC breaker
SSE-HH60K-P3US-S:240A AC breaker
SSE-HH70K-P3US-S:240A AC breaker

③ AC Breaker for Generator port

SSE-HH30K-P3US-S:240A AC breaker
SSE-HH40K-P3US-S:240A AC breaker
SSE-HH50K-P3US-S:240A AC breaker
SSE-HH60K-P3US-S:240A AC breaker
SSE-HH70K-P3US-S:240A AC breaker

6.12 Three phase parallel connection system

CAN L wire N wire PE wire



④⑥⑧ AC Breaker for grid port

SSE-HH30K-P3US-S:240A AC breaker
SSE-HH40K-P3US-S:240A AC breaker
SSE-HH50K-P3US-S:240A AC breaker
SSE-HH60K-P3US-S:240A AC breaker
SSE-HH70K-P3US-S:240A AC breaker

⑤⑦⑨ AC Breaker for backup load

SSE-HH30K-P3US-S:240A AC breaker
SSE-HH40K-P3US-S:240A AC breaker
SSE-HH50K-P3US-S:240A AC breaker
SSE-HH60K-P3US-S:240A AC breaker
SSE-HH70K-P3US-S:240A AC breaker

①②③ DC Breaker for battery

SSE-HH30K-P3US-S:400A DC breaker
SSE-HH40K-P3US-S:400A DC breaker
SSE-HH50K-P3US-S:400A DC breaker
SSE-HH60K-P3US-S:400A DC breaker
SSE-HH70K-P3US-S:400A DC breaker

⑩ AC Breaker for home load

Depends household loads

APP Settings

Master inverter

Parallel Setting Save
Parallel Type: Parallel Master
Parallel Number: 3
Parallel Address: 1

Slave Inverter

Parallel Setting Save
Parallel Type: Parallel Slave
Parallel Number: 3
Parallel Address: 2

Slave Inverter

Parallel Setting Save
Parallel Type: Parallel Slave
Parallel Number: 3
Parallel Address: 3

NOTICE

1.Only One Master Inverter in a Parallel System

a.In a parallel configuration, the system must have one and only one master inverter to manage overall operations and coordinate communication among the connected inverters.

2.CT Sampling Line or Meter Communication Line Must Be Connected to the Master Inverter

a.The CT sampling line or the electric meter communication line must be connected directly to the master inverter, which is designated to handle critical data such as current sampling and power measurement.

b.The master inverter is always assigned as Address 1.

3.Slave Inverter Addresses Start from 2 and Are Assigned Sequentially

a.The slave inverters should be assigned addresses starting from 2, with each subsequent inverter receiving the next sequential address (e.g., 2, 3, 4, etc.).

b.Proper address assignment ensures accurate communication and coordination within the system.

7. Wi-Fi&BLE stick installation

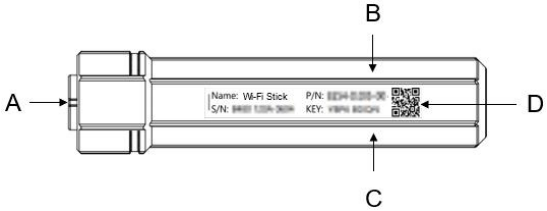
7.1 Indication

A:Circular Connector Interface: Connect to inverter and communication

B:Red LED: Inverter communication indication

C:Green LED: Network communication indication

D:Product label: Show product information



1.LED glow only when the Wi-Fi&BLE stick is powered on.

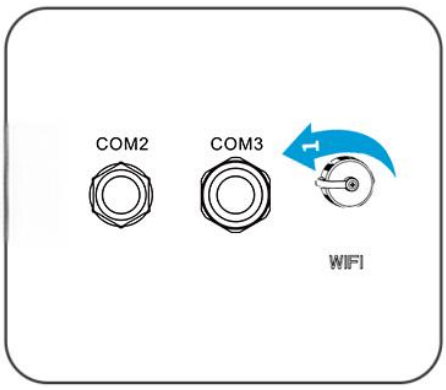
2.When the Wi-Fi&BLE stick is powered on, the green LED glows for 3S as a power on indication.

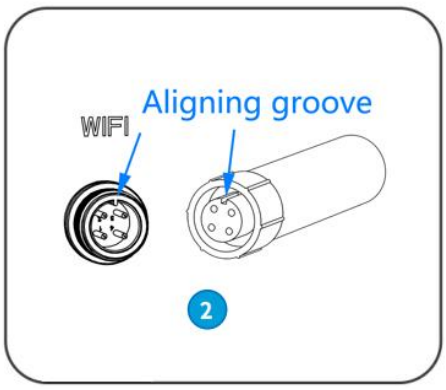
3.The more detail LED indication please refer chapter 9 “LED indication and trouble shooting”.

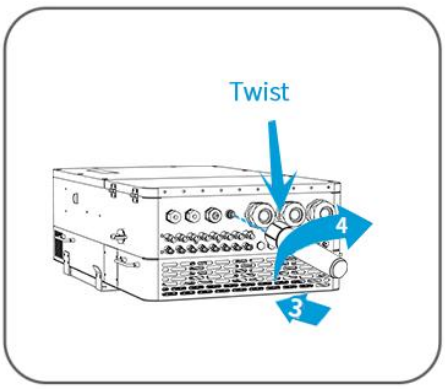
7.2 Install the Wi-Fi&BLE stick

Follow the installation steps!

1.Remove the waterproof cover.	2.Aligning groove.
3.Plug in WiFi module.	4.Revolve to lock the WiFi module.







7.3 Web/APP

Item	Web View	APP	SOSEN Energy Web&APP manual
QR Code			
Website	https://sosen.inteless.com/	iOS: search “SOSEN Energy” in Apple Store Android: search “SOSEN Energy”in Google Play	https://www.soseninverter.com/

7.4 Wi-Fi Connection

The Wi-Fi connection diagram of Wi-Fi&BLE stick is shown in the figure below. The specific process can be downloaded the APP, and configure the network connection according to the operation guide of the APP.

NOTICE

Wi-Fi Trouble Shooting

1. Make inverter from the WiFi router less than 10 meters ;
2. Make phone from the device’s Bluetooth less than 5 meters ;
3. Make sure you enter the correct WiFi name and password;
4. The router need to be set to 2.4GHz band;
5. Set the router security mode to WPA2 or WPA, and it can not support WPA3.
6. Is the whitelist enabled on the router?

7.5 Installation qualification

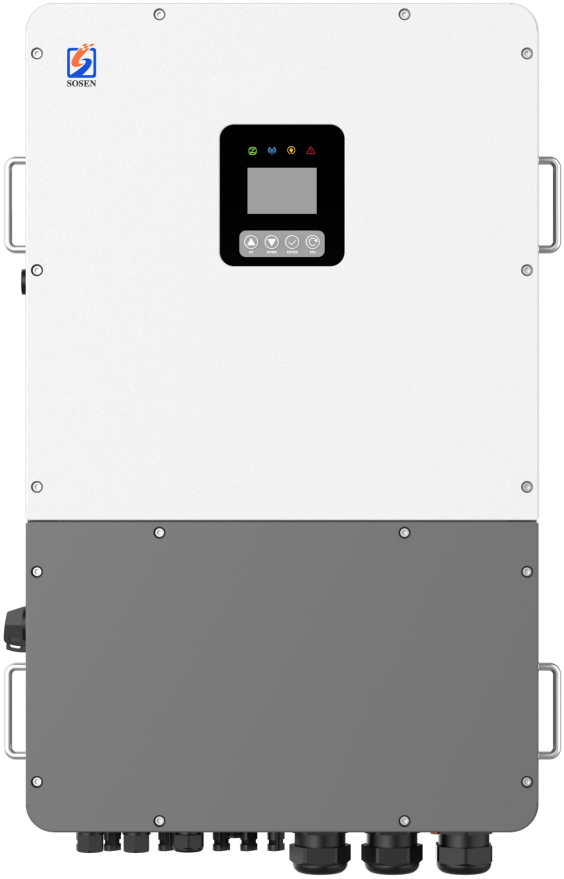
If the Wi-Fi&BLE stick works normally, red LED and green LED are always glowing. Otherwise, it needs to be corrected by referring to chapter 9 “LED indication and trouble shooting”

7.6 LED indication and trouble shooting

LED	State	Indication	
	Red LED:Inverter communication indication		Green LED:Network communication indication
	Cycle for 2S: flash once quickly, then glowing	Cycle for 2S: flash once quickly, then glowing	
	Not glow more than 20S	The power supply to the Wi-Fi&BLE stick is abnormal or damaged： 1. Check whether the power supply of the Aerial Plug Interface on the inverter is normal 2. Wi-Fi&BLE stick abnormal, contact the dealer	
	Cycle for 2S: flash once quickly, then off	Communication failure： Check whether the connection between the Wi-Fi&BLE stick and inverter is loose or poor contact	
	When powered on, continuously glows 3S, and then off	Power on indication	
	Glow more than 5S	Communication is normal	
	During the long glowing, flash occasionally	Network transmit data	
	Cycle for 20S: flash once quickly, then off	The route is not connected: 1. Check whether the password is right 2. Check the strength of the router	
	Cycle for 20S: flash 3 times continuously, then off	Connect to the route, but can't connect to the cloud server： 1. Check whether the router has Internet access permission 2. Check the firewall setting	
	Cycle for 20S: flash 4 times continuously, then off	Wi-Fi&BLE stick information error: Please contact the dealer	

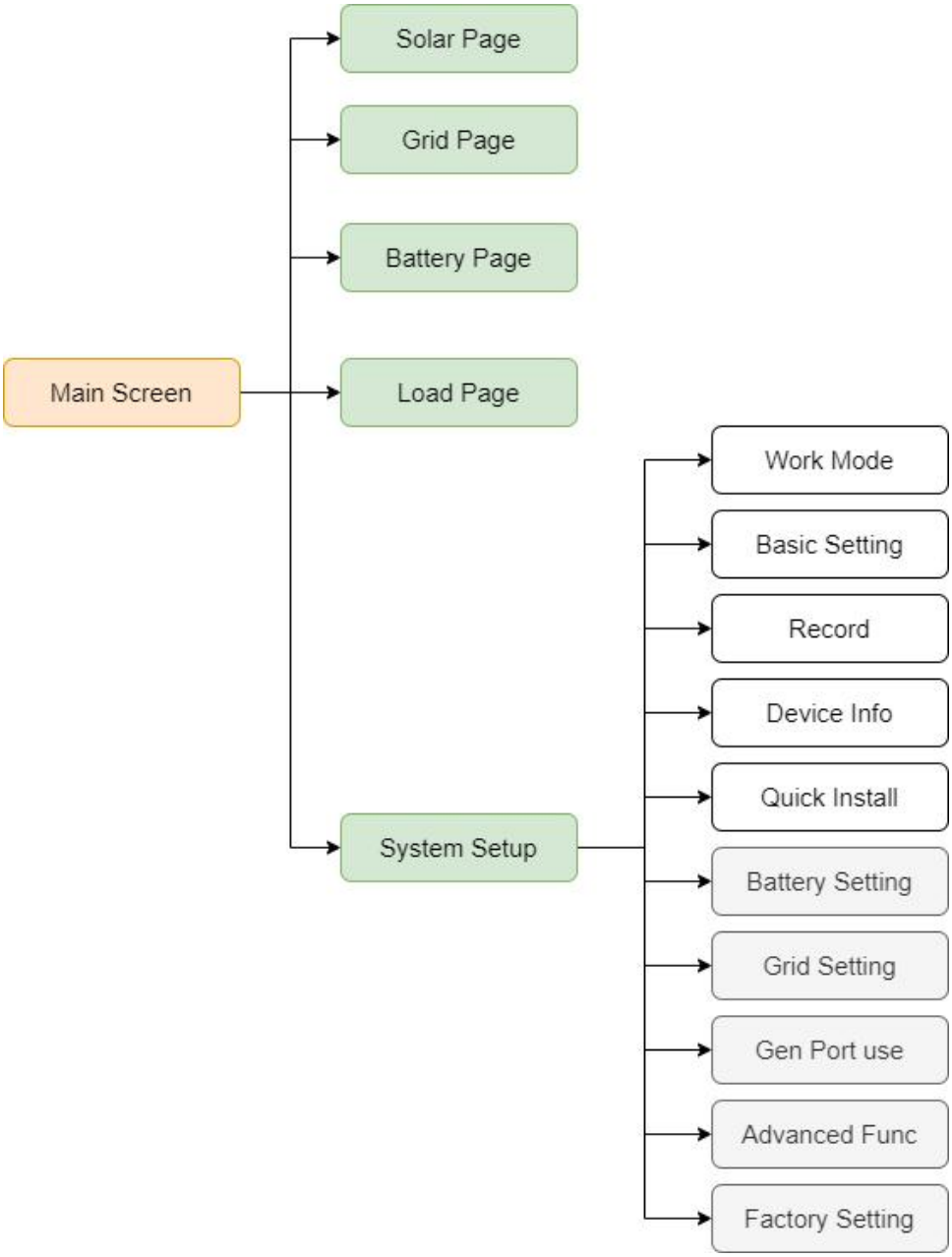
8.Operation

8.1 Indicator panel



Name	Object	Function
Indicator LED	A	Green : ON, The inverter is running ; Flash is Standby.
	B	Blue : ON, Communication with BMS normal.
	C	Yellow : ON, The inverter is in EPS mode.
	D	Red : The inverter is in fault mode.
	E	UP:To go to previous selection
	F	DOWN:To go to next selection
	G	ENTER:To confirm the selection
	H	ESC:To exit setting mode

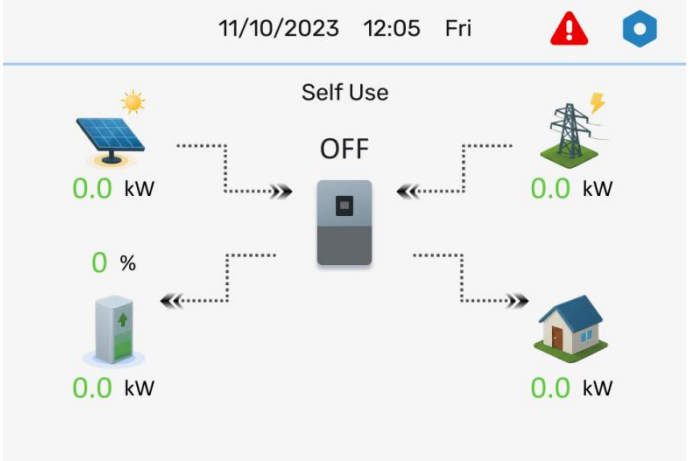
8.2 LCD operation flow chart



8.3 LCD Display Icons

8.3.1 Main Screen

The LCD is touchscreen,below screen shows the overall information of the inverter.



1.System Information Display

1.1 Date and Time

At the top of the screen displays the current system date and time.

1.2 Warning Icon ('!')

A red '!' mark indicates a system fault or abnormal condition.

Clicking the icon opens the fault detail page,where users can check the alarm messages and fault codes.

Follow the on-screen guidance or troubleshooting manual to resolve issues.

1.3 Settings Icon (Gear)

Click to access the system settings menu.

Includes configuration options such as operation mode,battery parameters,grid settings,etc.

2.Inverter Status and Operating Mode

2.1 Inverter Power Status

The icon in the center represents the inverter unit.

Its power status is clearly shown as ON or OFF.

2.2 Current Operating Mode Display

The active system mode is shown above the inverter icon.

Possible modes include:TOU ECO,Self-Use,Backup,etc.

This helps users understand how the system is currently

3.Real-Time Energy Device Overview

The four blue icons visually represent the status and power of key energy components.Each icon is interactive:

3.1 Top Left--PV

Displays real-time solar generation power.

Click to view detailed PV status.

3.2 Top Right--Grid

Shows grid import power.

Click to view grid connection information.

3.3 Bottom Left--Battery

Displays current battery state of charge and charge/discharge power.

Click to view battery details.

3.4 Bottom Right--Load

Shows real-time load consumption.

Click to access detailed load information.

4.Energy Flow and Connection Indicators

4.1 Arrow Indicators

Arrows illustrate real-time energy flow paths.

The direction indicates the power flow direction (e.g.,from PV to Load).

4.2 Red“X"Icons

Indicate that a path or device is not connected or inactive.

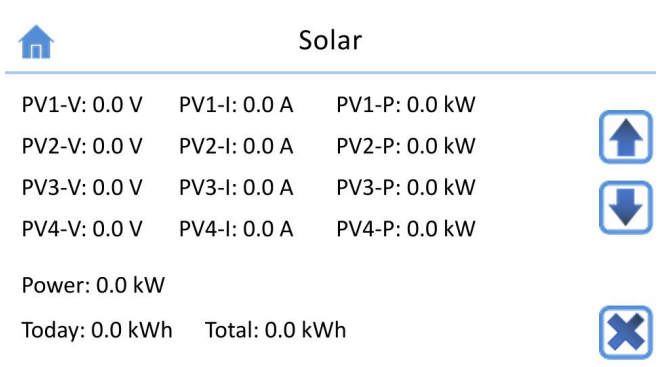
Examples include:battery not installed,grid offline,etc.

-PV power and Load power always keep positive.

-Grid power negative means get from grid,positive means sell to grid.

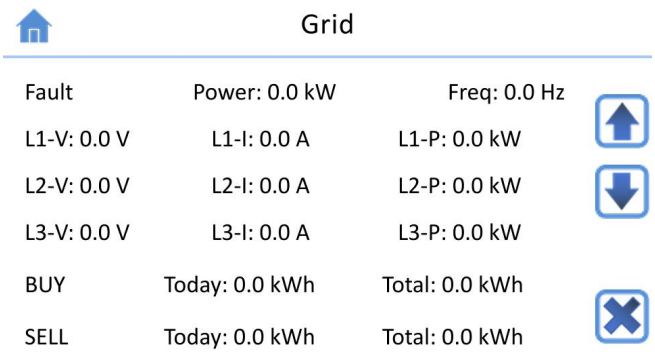
-Battery power negative means charge,positive means discharge.

8.3.2 PV Information Page Overview



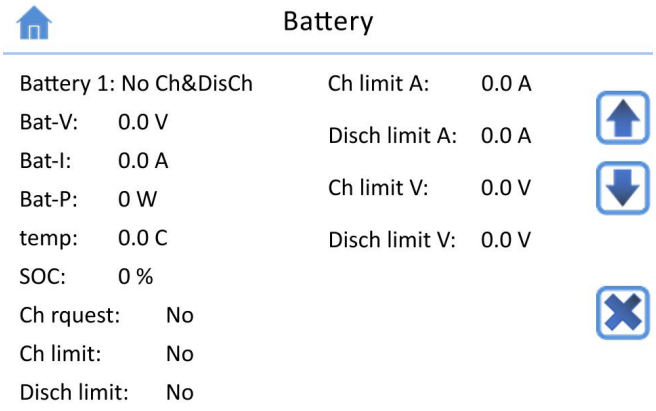
(Subject to variation depending on project configuration)
When the PV icon on the main interface is clicked, the system navigates to the PV information page. Here, PV1 to PV4 display the voltage, current, and power data for each of the four PV input channels. Below these readings, users can view the total current PV power, the energy generated today, and the historical cumulative generation. Page navigation arrows on the side of the screen allow users to scroll through additional PV data pages

8.3.3 Grid Information Page Overview



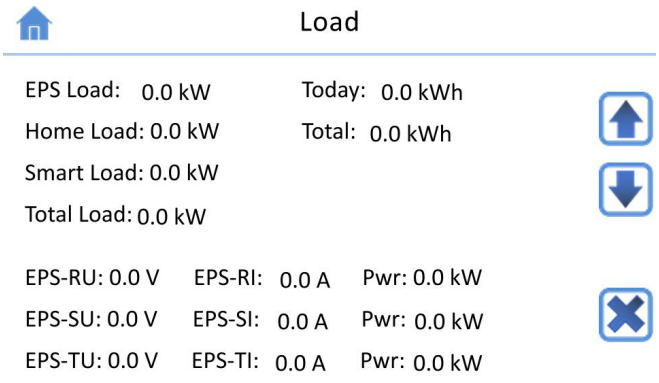
The Status field indicates the operating condition of the inverter; in this example, the current status is “Fault.”
The Power field displays the total grid power.
Freq refers to the present grid frequency.
L1, L2, and L3 represent the three AC phases (R, S, T), each showing their respective voltage, current, and power values.
At the bottom of the page, the energy purchased from the grid is displayed, including both the daily purchased energy and cumulative purchased energy. (Note: These fields may vary depending on the specific project configuration.)

8.3.4 Battery Information Page Overview



This page displays the operating information of Battery 1 and Battery 2 (subject to variation depending on the project configuration).
Key parameters include the current battery status, voltage, current, power, temperature, and State of Charge (SOC).

8.3.5 Load Information Page Overview

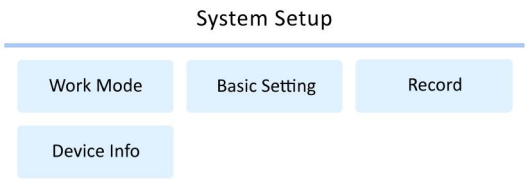


(Subject to variation depending on the project configuration)
This page includes readings for EPS load power, household load power, smart load power, and the total load power.
Below these values, the page also displays the voltage, current, and power for the three AC phases: R, S, and T (corresponding to L1, L2, and L3).

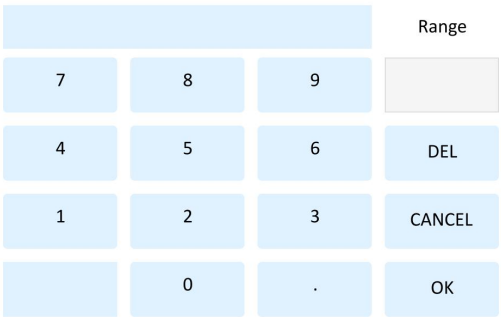
8.4 System Setup Menu

System Settings Page (Standard User Access)

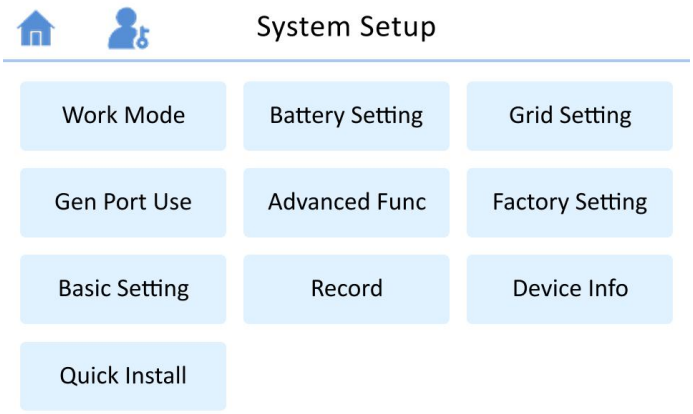
This is the settings page available under standard user permissions.



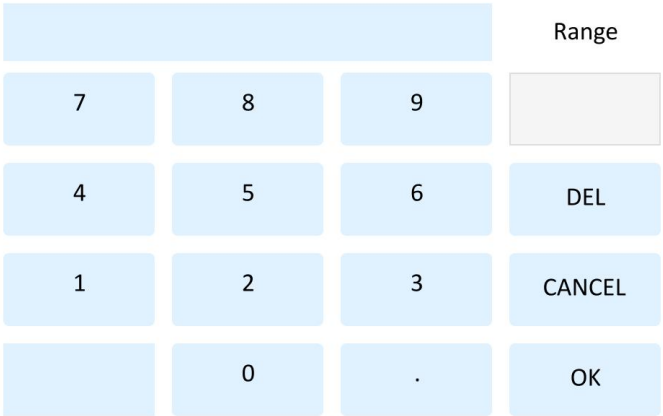
To enter basic settings mode, click the icon in the upper-left corner and enter the password **0000**.



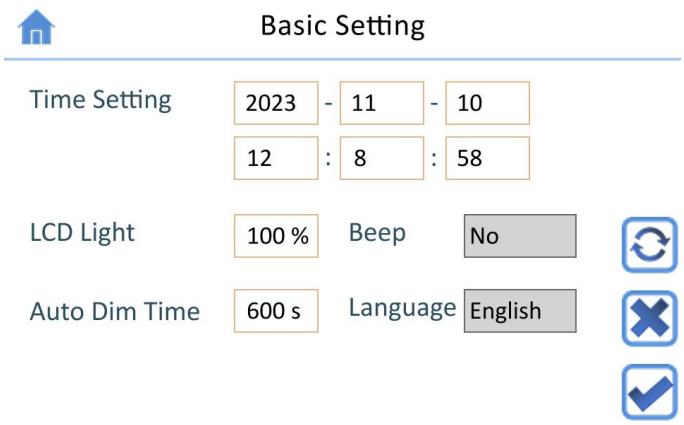
Advanced User Access



To enter advanced settings mode, click the icon in the upper-left corner and enter the password 7777.
Once verified, the system will open the Advanced Settings Page, where users can access additional configuration options not available under standard permissions.



8.5 Basic Settings Menu



-Time Setting:

Set the system's date and time, including year, month, day, hour, and minute.

-LCD Light:

Adjust the screen brightness level.

-Beep:

Enable or disable the buzzer.

Enabled by default; the buzzer will sound upon touch or key press.

-Auto Dim Time:

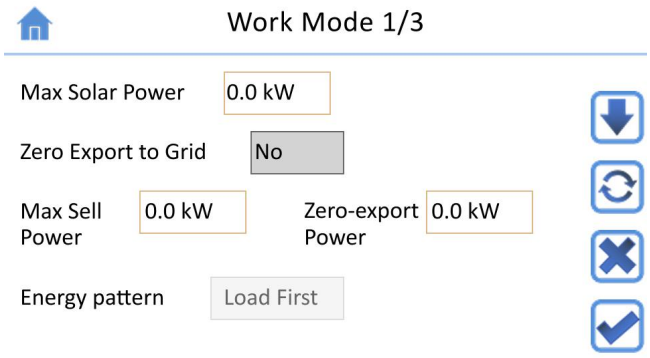
Set the duration before the screen automatically dims or turns off.

-Language:

Select the system display language.

8.6 Work Mode Settings Menu

Work Mode Settings-Page 1



-Max Solar Power:

Sets the maximum PV input power.

Zero Export to Grid:

When enabled,the inverter limits the amount of power exported to the grid.

The actual export limit is defined by the Zero-export Power setting.

-Zero-export Power:

Specifies the inverter's export power limit to the grid.

This setting takes effect only when Zero Export to Grid is enabled.

-Max Sell Power:

Sets the maximum power that can be exported to the grid.

-Energy Pattern:

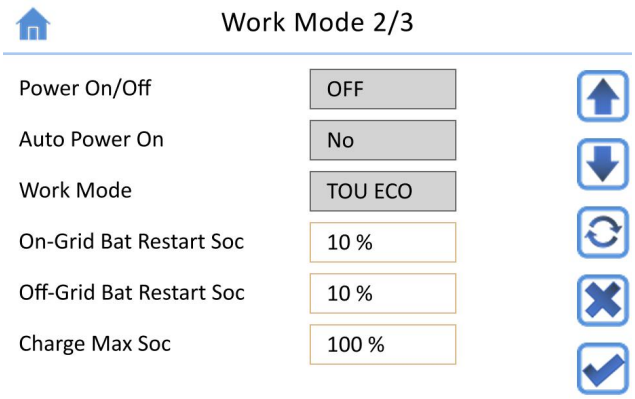
Defines the system's energy priority strategy.Currently,only **Load First** mode is supported.

-Load First:

PV power is used first to supply the load.

Any surplus PV energy is then used to charge the battery. If PV is insufficient,the grid will supply the load.

Work Mode Settings-Page 2



-Power On/Off:

Manually switches the inverter ON or OFF.

-Auto Power On:

Enables automatic startup and shutdown.

When enabled,the inverter will power on automatically.

-Work Mode:

Sets the system's working mode.Available options include:

Self-USE,TOU ECO,Backup Power,and Grid Priority.

-On-Grid Bat Restart SOC:

When the inverter is connected to the grid:

Battery is allowed to discharge if SOC 10%.

If battery SOC drops below(Restart SOC-3),the inverter will trigger forced charging to

raise SOC back to 10%.

-Off-Grid Bat Restart SOC:

When the inverter is off-grid (not connected to the utility):

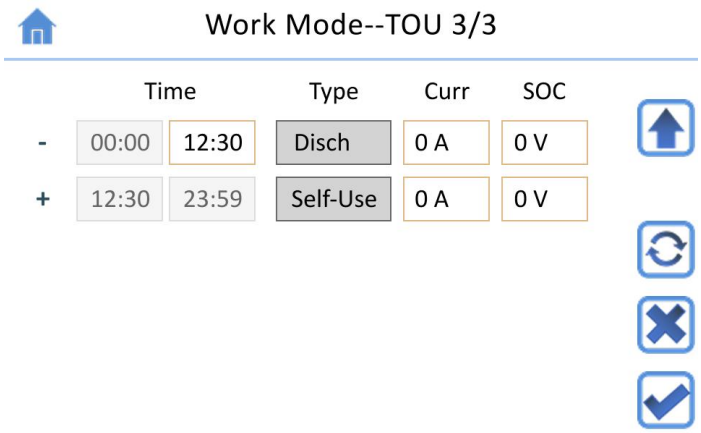
Battery is allowed to discharge if SOC 10%.

-Charge Max SOC:

Sets the maximum battery SOC for charging.

Once this limit is reached,charging will stop automatically.

Work Mode Settings-Page 3(TOU Mode Settings)



To enable TOU scheduling, the Work Mode on **Work Mode Settings – Page 2** must be set to **TOU ECO**. Only then will the time-based configuration become effective.

-Time:Defines the time slots used for energy management.

The full 24-hour day must be divided into continuous,non-overlapping periods.Each time slot includes a start time and an end time.Up to 6 time slots can be added by clicking the "+"icon.

-Type:Defines the behavior of the system during the time slot:

Discharge:Battery discharges according to the specified parameters.

Charge:Battery charges using PV or grid power.

Self-Use:Prioritizes self-consumption from PV.

-Curr:Sets the maximum charging or discharging current for the battery.

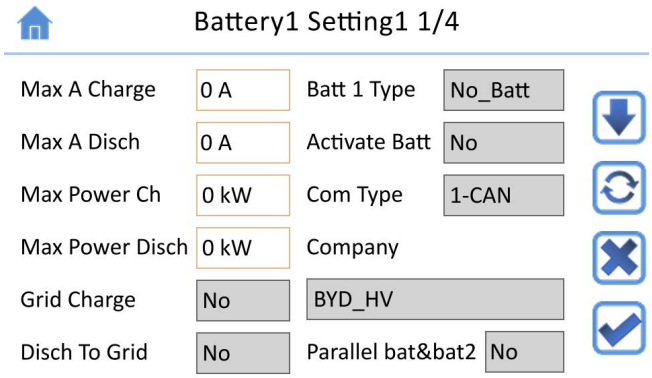
-SoC:Target SOC value for the battery during the time slot.

Example Schedule:

Time Period	Priority Type	Zero Export Disabled	Zero Export Enabled
00:00 – 12:30	Discharge	- Battery discharges if SOC > 20% (up to 50A limit) - Excess PV is exported to the grid	- Same discharge behavior - Excess PV charges battery to avoid waste
12:30 – 16:30	Self Use	- Battery discharges if SOC > 40% when PV cannot meet load - Battery charges if SOC < 36% using PV or grid - Remaining PV is exported	- Same behavior - No export allowed: Excess PV not used for load or charging is curtailed
16:30 – 23:59	Charge	- Battery charges if SOC < 90% using PV + grid (up to 30A) - Excess PV is exported	- Same charging behavior - No export allowed: Any excess PV after charging is curtailed

8.7 Battery Settings Menu

Battery1 Setting1 – Page 1



1.-Max A Charge / Max A Disch:

Set the **maximum battery charging current** and **maximum battery discharging current**, respectively.

-Max Power Ch / Max Power Disch:

Set the **maximum charging power** and **maximum discharging power** for the battery.

-Grid Charge:

Enables or disables battery charging from the utility grid.

2.-Parallel Bat & Bat2:

For inverter models with two battery ports, enabling this function allows a single battery to be connected to both **Battery Port 1** and **Battery Port 2** simultaneously.

In this case, the battery communication cable should be connected to the inverter's **BMS1 port**.

-Batt1 Type:

Select the battery type. Available options include: **Lithium**, **Lead-acid**, **DC Source**, and **No Battery**.

-Activate Batt:

Manually triggers battery activation or wake-up.

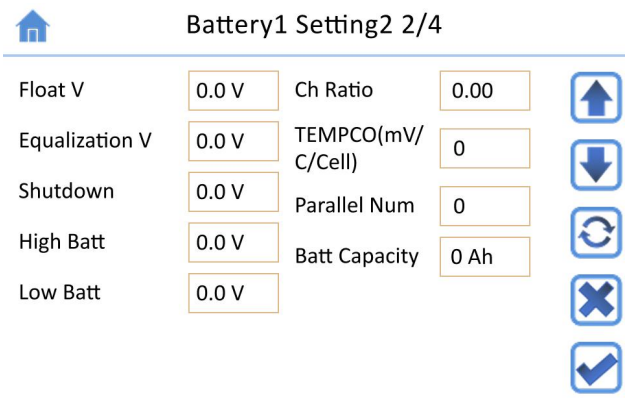
3.-Com Type:

Select the battery communication protocol: **CAN** or **RS485**

-Company:

Select the battery manufacturer. The system will automatically match the correct communication protocol based on the selected brand.

Battery1 Setting2 – Page 2



Float V:

Sets the **battery float charging voltage**.

Ch Ratio:

Sets the **charging C-rate** (charging ratio), applicable **only to lead-acid batteries**.

Equalization V:

Sets the **equalization charging voltage**.

TEMPCO:

Battery **temperature compensation coefficient**, applicable **only to lead-acid batteries**.

Shutdown:

Sets the **battery discharge cutoff voltage** for protection.

Parallel Num:

Sets the **number of parallel-connected battery groups**. This setting is required **only for lead-acid batteries** used in multiple parallel clusters.

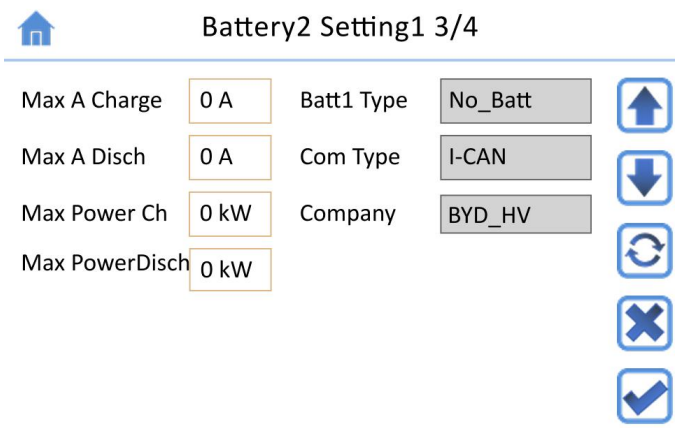
High Batt / Low Batt:

Define the **battery port over-voltage** and **under-voltage protection thresholds**, respectively.

Batt Capacity:

Set the **battery capacity**, applicable **only to lead-acid batteries**.

Battery2 Setting1 – Page 3



1.-Max A Charge / Max A Disch:

Set the **maximum battery charging current** and **maximum battery discharging current**, respectively.

-Max Power Ch / Max Power Disch:

Set the **maximum charging power** and **maximum discharging power** for the battery.

-Grid Charge:

Enables or disables battery charging from the utility grid.

2.-Batt2 Type:

Select the battery type. Available options include:

Lithium, **Lead-acid**, **DC Source**, and **No Battery**.

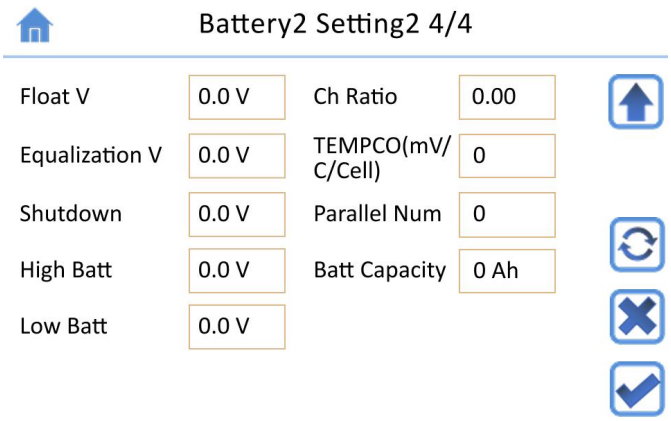
3.-Com Type:

Select the battery communication protocol: **CAN** or **RS485**

-Company:

Select the battery manufacturer. The system will automatically match the correct communication protocol based on the selected brand.

Battery2 Setting2 – Page 4



Float V:

Sets the **battery float charging voltage**.

Ch Ratio:

Sets the **charging C-rate** (charging ratio), applicable **only to lead-acid batteries**.

Equalization V:

Sets the **equalization charging voltage**.

TEMPCO:

Battery **temperature compensation coefficient**, applicable **only to lead-acid batteries**.

Shutdown:

Sets the **battery discharge cutoff voltage** for protection.

Parallel Num:

Sets the **number of parallel-connected battery groups**. This setting is required **only for lead-acid batteries** used in multiple parallel clusters.

High Batt / Low Batt:

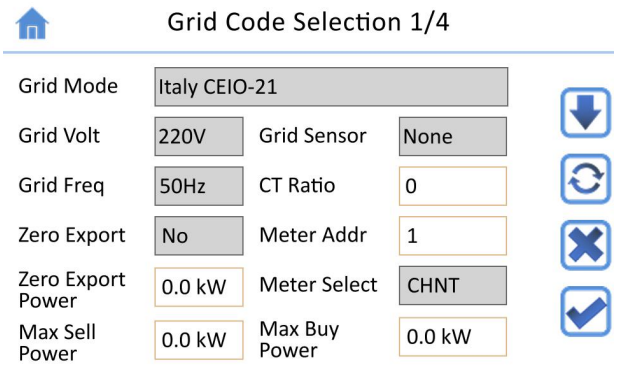
Define the **battery port over-voltage** and **under-voltage protection thresholds**, respectively.

Batt Capacity:

Set the **battery capacity**, applicable **only to lead-acid batteries**.

8.8 Grid Settings Menu

Grid Settings – Page 1



Grid Mode: Select the national grid standard according to the installation region (e.g.,Italy-CEI0-21,Spain UNE217002).

Grid Sensor: Configuration of the grid-side current sampling method.Options include:

None:Inverter samples current internally at the grid port.

CT:External current transformer(CD)is used for sampling.

Meter:External smart meter connected via RS485 for grid data acquisition.

Grid Volt:Set the nominal grid voltage according to the country standard.

Grid Freq:Set the nominal grid frequency based on the local grid specification.

CT Ratio:Set the CT transformation ratio.

Zero Export:When enabled,the inverter will limit the power exported to the grid.

The limit is defined by the Zero-export Power setting.

Zero-export Power: Sets the maximum inverter export power.This is only effective when Zero Export is enabled.

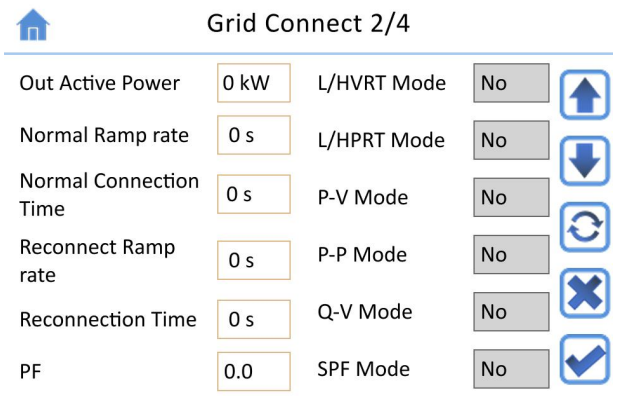
Meter Addr: Set the RS485 address of the external energy meter.

Meter Select:Select the meter manufacturer.Please ensure the selected model matches the actual hardware.

Max Sell Power:Sets the maximum allowed output power exported to the grid.

Max Buy Power:Sets the maximum allowed input power drawn from the grid to the inverter

Grid Settings – Page 2



Reserved:This function is reserved.It is not recommended.Please inform the manufacturer/installer before setting up

Out Active Power:

Sets the maximum apparent power output to the grid.

Normal Ramp Rate:

Sets the power ramp-up time after inverter startup.

Normal Connection Time:

Sets the time delay before the inverter injects active power to the grid after startup.

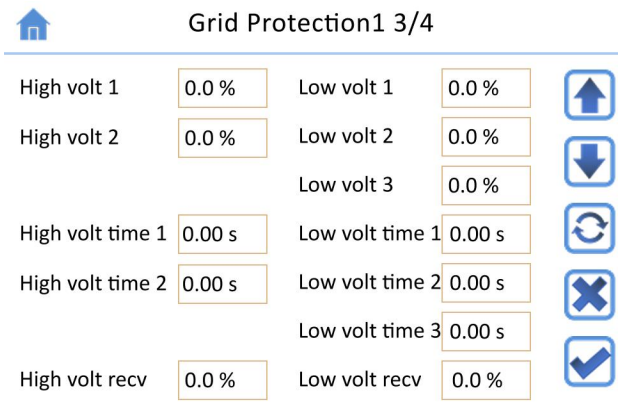
Reconnect Ramp Rate:

Sets the ramp-up time for active power after fault recovery.

Reconnection Time:

Sets the reconnection delay time after a fault is cleared.

Grid Settings-Page 3



Reserved:This function is reserved.It is not recommended. Please inform the manufacturer/installer before setting up

High Volt 1/High Volt 2:Level 1 and Level 2 overvoltage protection thresholds (as a percentage of nominal voltage).

High Volt Time 1/High Volt Time 2:Time delays for triggering Level 1 and Level 2 overvoltage protection.

High Volt Recv:Grid overvoltage recovery threshold.

Low Volt 1 Low Volt 2:Level1 and Level 2 undervoltage protection thresholds,also defined as percentages of the nominal voltage.

Example

To adjust the acceptable voltage range of the inverter for grid connection:

Simply configure High Volt 1 and Low Volt 1 values.

If the nominal voltage is 230V:

High Volt 1 at 120%-Overvoltage point 276V

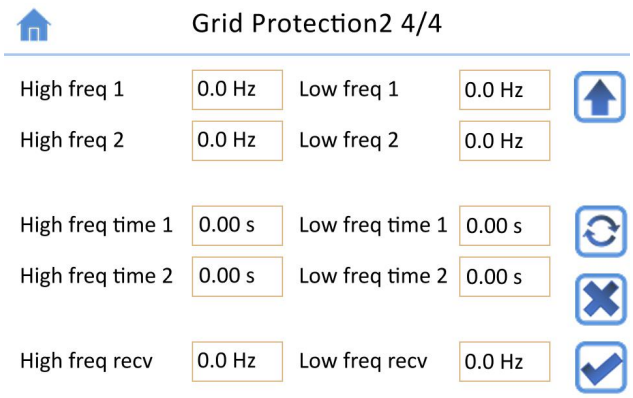
Low Volt 1 at 80%-Undervoltage point 184V

If the nominal voltage is 220V:

High Volt 1 at 120%-Overvoltage point 264V

Low Volt 1 at 80%-Undervoltage point 176V

Grid Settings-Page 4



Reserved:This function is reserved.It is not recommended. Please inform the manufacturer/installer before setting up

High Freq 1 and High Freq 2 refer to the first- and second-level over-frequency protection thresholds (in Hz). These values are typically based on the system's nominal frequency (e.g., 50Hz or 60Hz).

High Freq Time 1 and High Freq Time 2 define the delay time before triggering protection actions when the grid frequency exceeds the corresponding threshold.

High freq recv: The recovery point frequency value of the power grid overfrequency protection. When the frequency recovers from too high to below this value, the system will allow reconnection to the grid or resume operation.

Low Freq 1 and Low Freq 2 represent the first- and second-level under-frequency protection thresholds. If the frequency falls below these values, protection will be triggered accordingly.

Low Freq Time 1 and Low Freq Time 2 set the delay durations before activating under-frequency protection once the frequency drops below the set limits.

Low Freq Recv:The recovery threshold for under-frequency protection. The system will reconnect or resume operation when the grid frequency rises above this value.

Example:
If the system nominal frequency is 50Hz, and the settings are as follows:

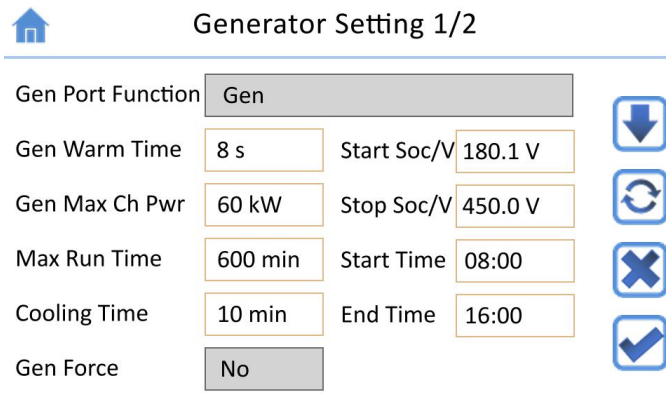
High Freq 1 = 52Hz, Low Freq 1 = 47Hz
The system will trigger first-level protection when the frequency goes above 52Hz or below 47Hz, based on the defined time delays.

High Freq 2 = 53Hz, Low Freq 2 = 46Hz
More severe deviations will activate second-level protection mechanisms.High Freq 1 and High Freq 2 refer to the first- and second-level over-frequency protection thresholds (in Hz). These values are typically based on the system's nominal frequency (e.g., 50Hz or 60Hz).

8.9 Generator Port Settings Menu

Gen Port Function

Select the functional mode of the generator port. Available options:



None:No function assigned.This is the default setting.

Generator:The port is used as an input for generator power.Once the generator starts,its

power is used to charge the battery.

Smart Load:The port is used as a dedicated load output,with user-defined working conditions for smart load control.

When Gen Port Function is set to Generator, the following parameters become effective:

Gen Warm Time:

Generator warm-up time. After the inverter sends the start signal, it waits for this duration before accepting generator input.

Start SOC / Stop SOC:

Battery SOC thresholds for starting and stopping the generator automatically.

Gen Rated Power:

Maximum power output of the generator.

Max Run Time:

Maximum continuous run time for the generator. Applies when the inverter is automatically controlling the generator.

Cooling Time:

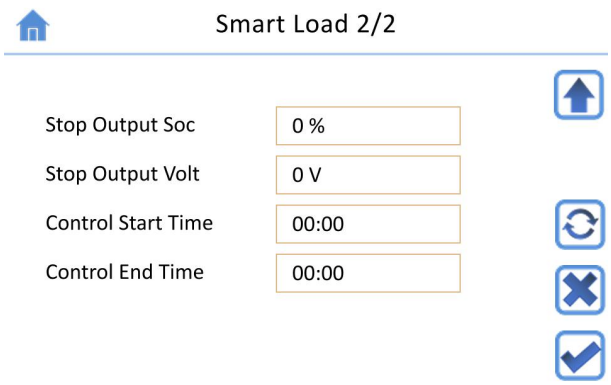
Generator cooldown period after stopping. Applies to inverter-controlled generator operation.

Gen Force:

Force Start Generator function. Should be enabled during the first-time connection of a generator to ensure recognition and activation.

Smart Load Configuration

This configuration page becomes effective only when Gen Port Function is set to Smart Load.



Stop Output SOC:

When the battery SOC drops to this threshold, the smart load output will automatically disconnect.

Stop Output Volt:

If voltage-based control is selected, the smart load output will disconnect when the battery voltage reaches this value.

Control Start Time:

Start of the time window during which the SOC or voltage control conditions are valid.

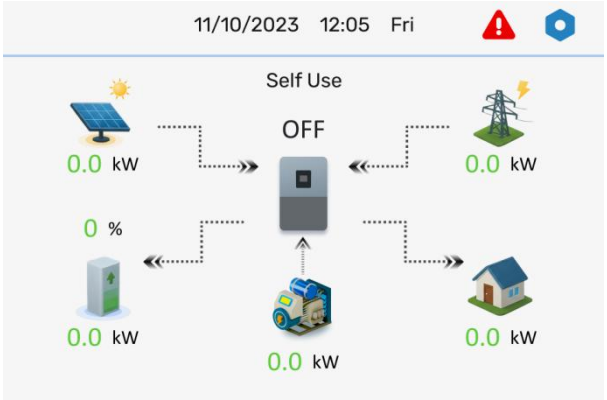
Control End Time:

End of the time window during which the SOC or voltage control conditions are valid.

Note:

Outside the defined time window, the smart load output is not restricted by SOC or voltage conditions, and will follow the same discharge behavior as the EPS output.

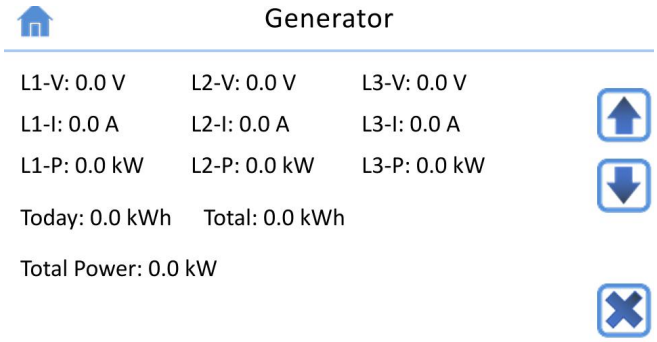
Accessing Generator Data from the Home Page



Once the generator function is enabled, a generator icon will appear on the home screen.

Clicking this icon will navigate to the Generator Details Page.

Generator Details Page



L1 / L2 / L3:

Displays the voltage, current, and power of each phase.

Additional Information:

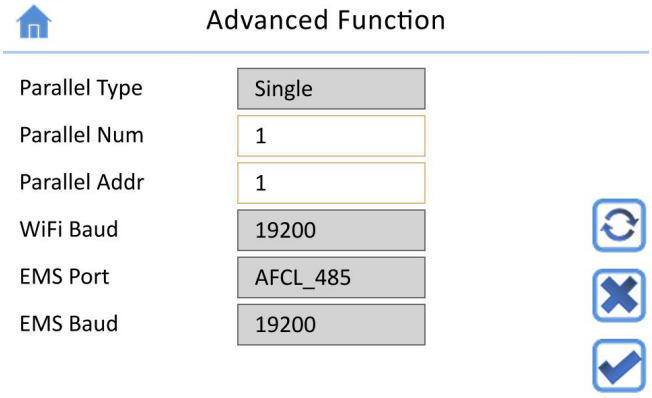
Today's Generated Energy

Total Historical Generation

Total Generator Power Output

8.10 Advanced Settings Menu

This page allows configuration of parallel settings, Wi-Fi baud rate, and EMS communication parameters.



1.Parallel Settings

Parallel Type:

Sets the parallel operation mode of the system.

Parallel Num:

Specifies the total number of inverters in the system (Master + Slaves).

Parallel Addr:

Sets the inverter address in the system.

The master inverter is always set to address 1.

Slave inverters follow in sequential order (2, 3, ...).

2.WiFi Baud:

Baud rate for communication between inverter and data logger.

EMS Port:

Designates the spare RS485 port on the inverter for EMS (Energy Management System) communication.

Default setting: AFCI_485 (can be changed based on actual use).

EMS Baud:

Sets the communication baud rate for the EMS Port.

Default value: 19200.

3. Parallel Configuration Screens – Example of 3-Inverter System

The following screenshots demonstrate how to configure a parallel system with one master inverter and two slave inverters. All settings must be consistent across devices, except for Parallel Addr, which should be unique per unit.

(1)Master Inverter Configuration

Advanced Function

Parallel Type	Master
Parallel Num	3
Parallel Addr	1
WiFi Baud	19200
EMS Port	AFCL_485
EMS Baud	19200

Parallel Type: Master

Parallel Num: 3 (total number of inverters)

Parallel Addr: 1

WiFi Baud: 19200

EMS Port: AFCI_485

EMS Baud: 19200

This inverter is designated as the master unit, responsible for synchronization and control across the entire system.

(2) Slave Inverter 1 Configuration

Advanced Function

Parallel Type	Slave
Parallel Num	3
Parallel Addr	2
WiFi Baud	19200
EMS Port	AFCL_485
EMS Baud	19200

Parallel Type: Slave

Parallel Num: 3

Parallel Addr: 2

WiFi Baud: 19200

EMS Port: AFCI_485

EMS Baud: 19200

This inverter operates as Slave 1, assigned address 2.

(3)Slave Inverter 2 Configuration

Advanced Function

Parallel Type	Slave
Parallel Num	3
Parallel Addr	3
WiFi Baud	19200
EMS Port	AFCL_485
EMS Baud	19200

Parallel Type: Slave

Parallel Num: 3

Parallel Addr: 3

WiFi Baud: 19200

EMS Port: AFCI_485

EMS Baud: 19200

This inverter operates as Slave 2, assigned address 3.
-Important Notes:

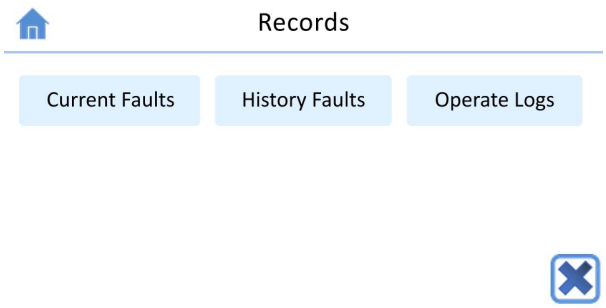
1. All inverters must have the same WiFi Baud rate and EMS Baud rate.

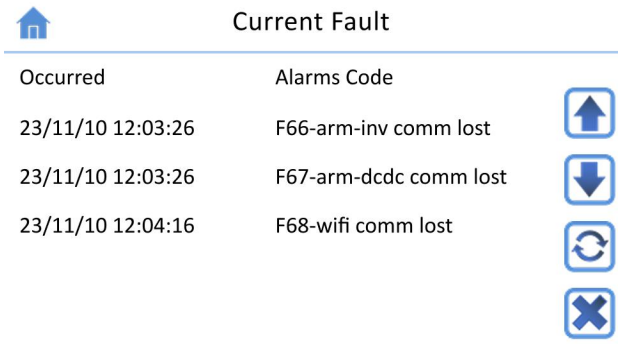
2. Ensure proper wiring and grounding between all units.

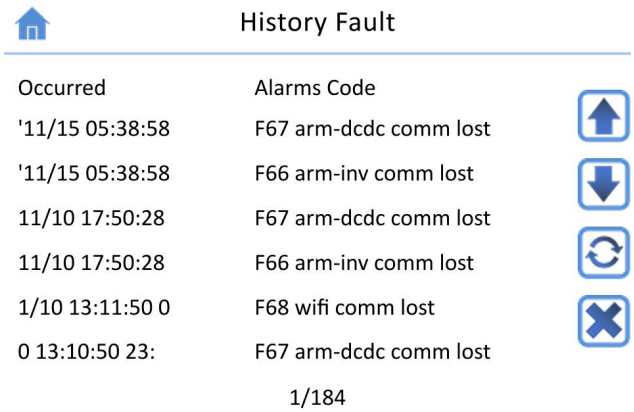
3. Make sure firmware versions are consistent across all inverters.

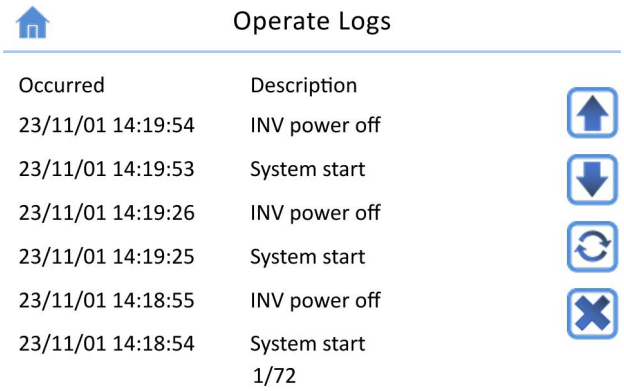
4. Communication cables (e.g. RS485 or CAN) must be securely connected.

8.11 Record Menu









Fault and Operation Logs

Current Fault:

Displays the inverter's active faults and alarms.

It includes the timestamp, fault code, and fault description of the current issue.

History Fault:

Shows the inverter's fault and alarm history.

It records the start time, recovery time, and details of each fault event.

Operate Logs:

Contains logs of user operations such as changing inverter modes, powering the system on/off, or adjusting system settings.

These logs are useful for tracking system changes and user actions.

8.12 Device Info Setup Menu

Device Info

Device type:	
Rated Power:	
SN:	
Model:	
ARM:	L1.0S
INV:	
DCDC:	
Run Time:	00 : 00 : 01 : 56

This page displays basic information about the inverter, including:

Device Type:The category or class of the inverter.

Model Number:The specific model identifier.

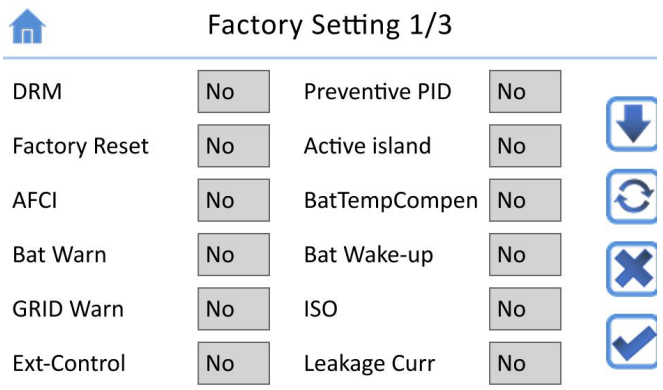
Serial Number:The unique identifier assigned to each unit.
Software Version:The currently installed firmware/software version.(ARM,INV,DCDC)

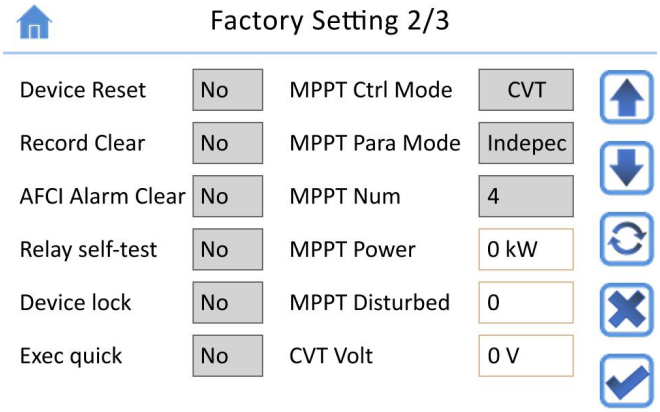
Run Time:Total runtime of the inverter since initial operation.

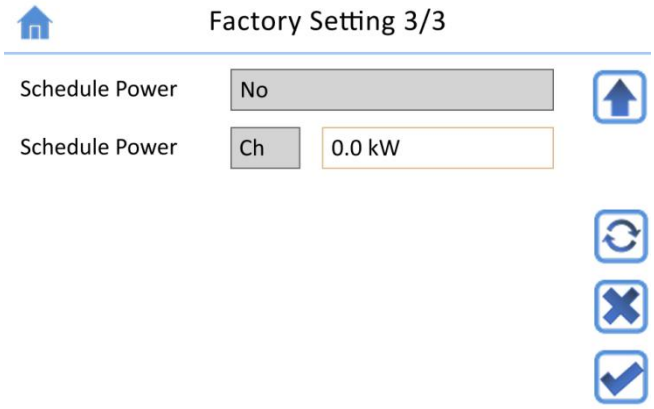
This page is useful for system diagnostics, firmware tracking, and technical support.

8.13 Factory Setting Menu

Reserved:This function is reserved.It is not recommended. Please inform the manufacturer/installer before setting up







9.Trouble Shooting

This section contains information and procedures for solving possible problems with the SSE-HH30-70K-P3US-S series inverters, and provides you with trouble shooting tips to identify and solve most problems that could occur with the SSE-HH30-70K-P3US-S series inverters.

This section will help you narrow down the source of any problems you may encounter.Please read the following trouble' shooting steps.

Check the warning or fault messages on the System Control Panel or Fault codes on the inverter information panel.If a message is displayed, record it before doing anything further.Attempt the solution indicated in below table.

Fault Code	**Solution**
Grid over frequency alarm	If there is an occasional alarm, it may be that the power grid is occasionally abnormal, and after the power grid is restored to normal, the inverter will automatically return to normal working state. If the alarm is frequent, check whether the grid voltage/frequency is set correctly, as well as the inverter's AC circuit breaker and AC wiring. If the check is correct and the alarm is still repeated, contact technical support
Grid under frequency alarm	
Grid overvoltage alarm	
Grid undervoltage alarm	
Grid long time OV alarm	If the power grid is abnormal, the inverter automatically returns to the normal working state after the power grid recovers.Or seek help from us, if not go back to normal state.
Grid amplitude fast inspection alarm	
Grid DC component fast detection alarm	
Grid phase fast inspection alarm	
Overload protection	If the load power is too high or the device is downgraded, please reduce the power consumption. Or seek our help if you are unable to return to a normal state.
Overload alarm	
CT reverse connect failure	Check whether the CT connection is correct.
CT fault	
Ground fault	Check whether the PE cable is grounded properly.
Grid phase deficiency alarm	Check whether the AC input cable is correctly connected.
LN reverse connect failure	
Grid phase abnormal alarm	
INV overvoltage fault	The inverter is faulty. Procedure Turn off the PV, grid, and battery, and wait 5 minutes before turning on the inverter. Check whether the problem is resolved.Or seek help from us, if not go back to normal state.
INV undervoltage fault	
Leakage current self-test failure	
Short circuit fault	
INV overcurrent protection	
INV bus overvoltage protection	
INV bus undervoltage protection	

Bus unbalance alarm	The inverter is faulty. Procedure Turn off the PV, grid, and battery, and wait 5 minutes before turning on the inverter. Check whether the problem is resolved.Or seek help from us, if not go back to normal state.
Relay self-test failure	
INV fault lock	
Bus buffer fault	
INV phase lock fault	
Internal para matching fail	
Aux power fault	
Fan fault	
DC fault lock	
DC bus overvoltage protection	
DC bus overvoltage protection	
Leakage current over limit fault	
PV1 overcurrent protection	
PV2 overcurrent protection	
INV FLASH fault	The internal communication and storage are abnormal. Turn off the PV, grid, and battery, and wait 5 minutes before turning on the inverter. Check whether the problem is resolved.Or seek help from us, if not go back to normal state.
INV-DC communication failure	
ARM-INV communication failure	
ARM-DCDC communication failure	
Power module para mis-matched	
Power parameter set failure	
ARM FLASH abnormal	
DC-INV comm fault	
DC FLASH fault	
Host fault	Turn off the host PV, power grid, and battery, and wait 5 minutes before turning on the inverter. Check whether the problem is resolved.Or seek help from us, if not go back to normal state.
Parallel para mismatch fault	Check whether the parallel communication cable is properly connected.
Parallel line failure	
Discharge OC protection	Check whether the battery Settings are inconsistent with the battery specifications.
Charge OC protection	
DC BAT overvoltage protection	
DC BAT undervoltage protection	
BAT reverse connect failure	Check whether the positive and negative terminals of the battery power line are connected in reverse mode.
DC over-temperature alarm	Ensure that the inverter is installed in a place without direct sunlight. Make sure the inverter is installed in a cool/well-ventilated area. Ensure that the inverter is installed vertically and the ambient temperature is lower than the upper limit of the inverter temperature.
DC over-temperature fault	
INV over temperature protection	
INV over temperature alarm	
meter comm fault	Check whether the meter communication line is normal.

BMS-CAN comm abnormal	Make sure the battery you use is compatible with the inverter. Check whether the communication cables or ports between the battery and the inverter are properly connected
BMS-485 Comm abnormal	
NTC disconnected	Check whether cables to the NTC temperature sensor are properly connected.
PV1 overvoltage protection	Check whether the PV string voltage (Voc) is higher than the maximum input voltage of the inverter. If so, adjust the number of series PV modules and reduce the PV string voltage to fit the input voltage range of the inverter. After correction, the inverter will automatically return to the normal state.
PV2 overvoltage protection	
PV1 reverse connect protection	Check whether the PV cables are correctly connected.
PV2 reverse connect protection	
DC BAT overvoltage alarm	The inverter does not detect the battery voltage. Ensure that the battery switch system is started and cables are properly connected.
DC BAT undervoltage alarm	
BAT none-connected	
SOC low alarm	If the battery is low, replenish the battery in time.
BAT charge&discharge prohabition	If the internal fault of the lithium battery occurs, Turn off the PV, grid, and battery, and wait 5 minutes to turn on the inverter and lithium battery. Check whether the problem is resolved. Or seek help from us, if not go back to normal state.
BAT genaral fault	
BAT over-volt fault	
BAT under-volt fault	
BAT high-temp protection	
BAT low-temp protection	
BAT discharge over-curr protection	
BAT charge over-curr protection	
BAT contactor fault	
BAT short circuit	
BMS fault	
BAT cell protection	
BAT EOL	The battery is end of life,please contact factory.
BAT genaral warning	If the internal fault of the lithium battery occurs, Turn off the PV, grid, and battery, and wait 5 minutes to turn on the inverter and lithium battery. Check whether the problem is resolved. Or seek help from us, if not go back to normal state.
BAT high-volt warning	
BAT low-volt warning	
BAT high-temp warning	
BAT low-temp warning	
BAT discharge over-curr warning	
BAT charge over-curr warning	
BAT contactor warning	
BAT short circuit warning	
BMS internal warning	
BAT cell warning	

NOTICE

If your inverters information panel is not displaying a Fault light, check the following list to make sure that the present state of the installation allows proper operation of the unit.
Is the inverter located in a clean, dry, and adequately ventilated place?
Have the DC input breakers been opened?
Are the cables adequately sized and short enough?
Are the input and output connections and wiring in good condition?
Are the configurations settings correct for your particular installation?
Are the display panel and the communications cable properly connected and undamaged?
Contact our Customer Service for further assistance. Please be prepared to describe details of your system installation and provide the model and serial number of the unit.

10.Maintenance

10.1 Power ON the Inverter for first time

DANGER

Important: Please follow these steps to turn on the inverter.
Step 1:Press the Power on/off button to turn on the device, and keep the button pressed.
Step 2: make the PV SWITCH to the ON position.
Step 3: Turn on the battery. Turn on the DC switch between battery and inverter.
Step 4: Turn on the AC circuit breaker between the inverter port and the power grid.
Step 5: Open the AC circuit breaker between the inverter load port and the emergency load.
Step 6: Manually send the startup command through the APP (for safety, it can be set to automatic startup after the initial power-on).
Step 7: The inverter should start running now.

10.2 Power Off the Inverter

DANGER

- Power off the inverter before operations and maintenance. Otherwise, the inverter may shocks or occur.
- Delayed discharge. Wait until the components are discharged after power off.

Step 1: Turn off the AC breaker on the ON-GRID side of the inverter.
Step 2: Turn off the AC breaker on the BACK-UP side of the inverter.
Step 3: Turn off the battery breaker between the inverter and the battery.
Step 4: Turn off the PV switch of the inverter.

10.3 Removing the Inverter

WARNING

- Make sure that the inverter is powered off.
- Wear proper PPE before any operations.

Step 1: Disconnect all the cables, including DC cables, AC cables, communication cables, the communication module, and PE cables.
Step 2: Remove the inverter from the mounting plate.
Step 3: Remove the mounting plate.
Step 4: Store the inverter properly. If the inverter needs to be used later, ensure that the storage conditions meet the requirements.

10.4 Disposing of the Inverter

If the inverter cannot work anymore, dispose of it according to the local disposal requirements,
The inverter cannot be disposed of together with household waste.

WARNING

- Make sure that the inverter is powered off.
- Wear proper PPE before any operations.

10.5 Routine Maintenance

Maintaining Item	Maintaining Method	Maintaining Period
System Clean	Check the heat sink, air intake, and air outlet for foreign matter or dust.	Once6-12 months
PV Switch	Turn the DC switch on and off ten consecutive times to make sure that it is working properly.	Once a year
Electrical Connection	Check whether the cables are securely connected. Check whether the cables are broken or whether there is any exposed copper core.	Once 6-12 months
Sealing	Check whether all the terminals and ports are properly sealed. Reseal the cable hole if it is not sealed or too big.	Once a year