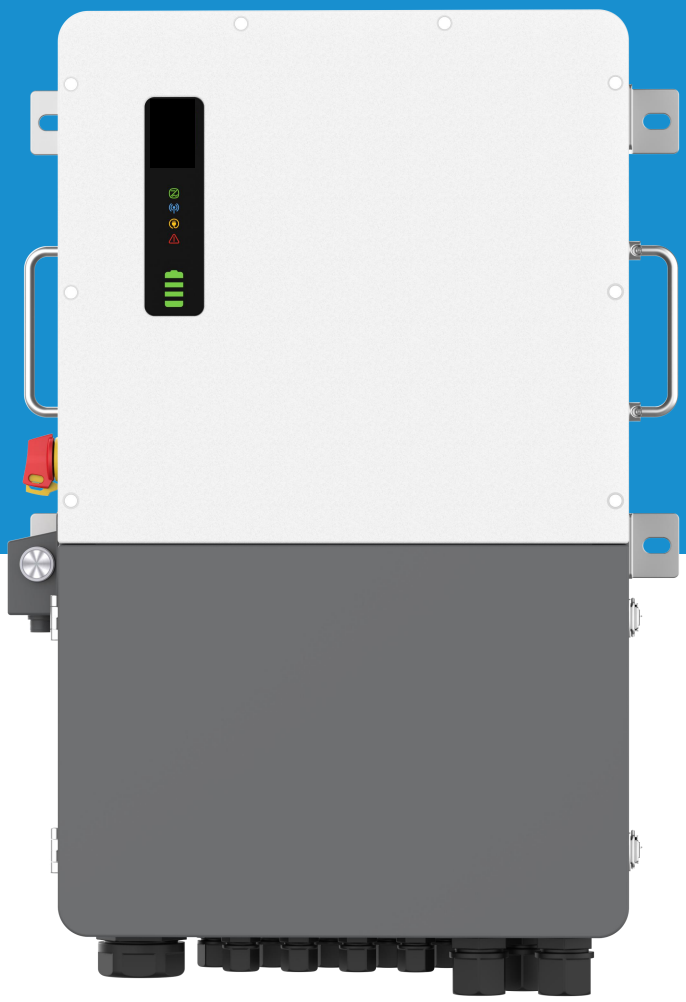
User Manual

Hybrid Inverter
HL8-15K-P2SA
Series



HL8K-P2SA
HL10K-P2SA
HL12K-P2SA
HL15K-P2SA

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

CONTENTS

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 our website.

1.1 Applicable Model

Model	Nominal Output Power	Nominal Output Voltage
HL8K-P2SA	8kW	120Vac / 240Vac（Split phase）; 208Vac（2/3 phase） 2L/N/PE
HL10K-P2SA	10kW	
HL12K-P2SA	12kW	
HL15K-P2SA	15kW	

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.

1.4 Updates

The latest document contains all the updates made in earlier issues.

V1.0 2024-11-11

- First Issue

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. For more warranty details,please visit visit our website.

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.		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.
	RCM marking		

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

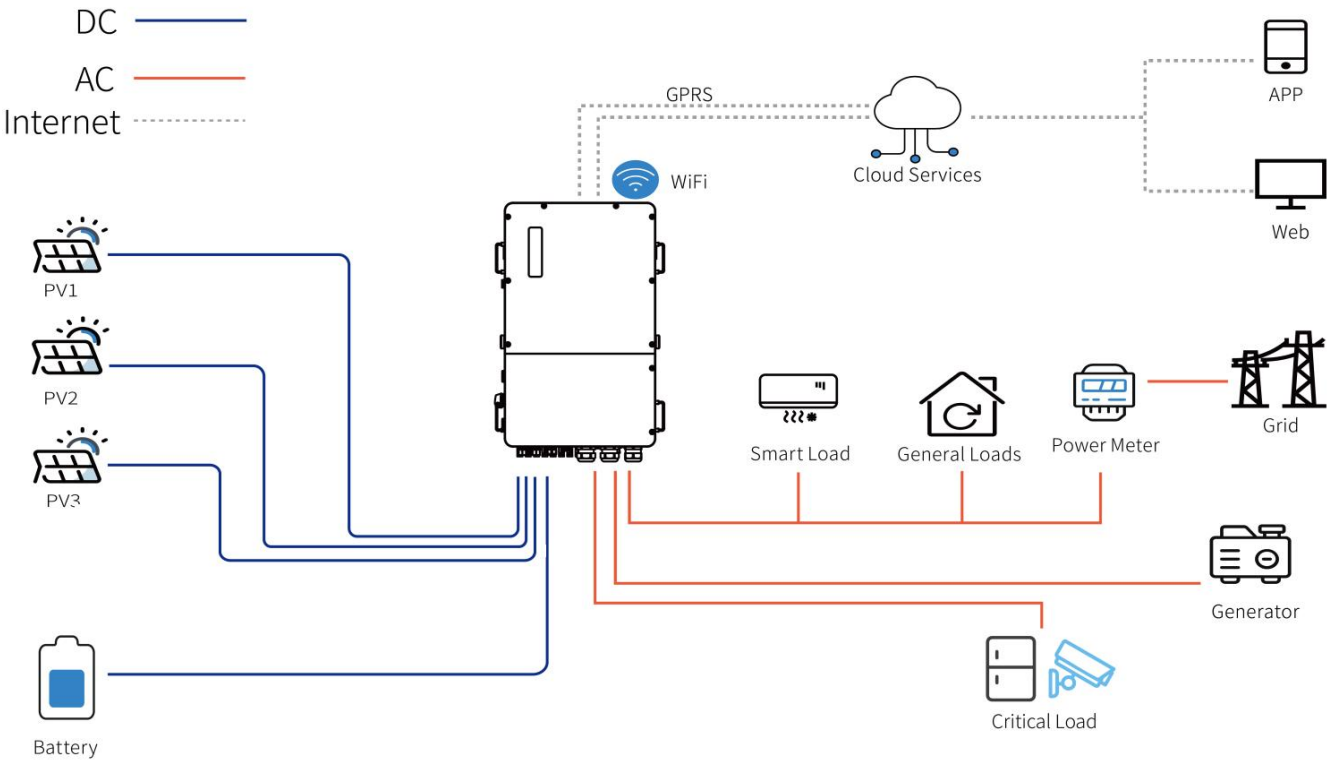
NOTICE

• 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

3.1 Product Features

Intended usage
This is a multifunctional inverter, combining functions of inverter, solar charger and battery charger to offer uninterruptible power support with portable size. its comprehensive LCD display offers user configurable and easy accessible button operation such as battery charging, AC/solar charging, and acceptable input voltage based on different applications.

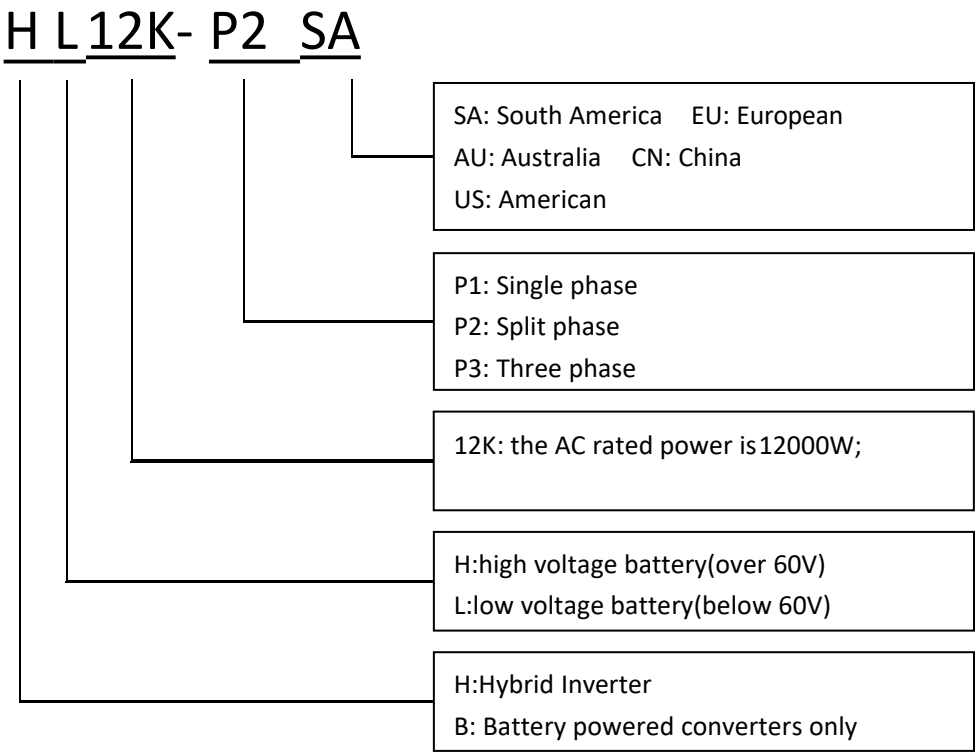


Model

This manual applies to the listed inverters below:

HL8K-P2SA HL10K-P2SA HL12K-P2SA

HL15K-P2SA **Model description**



Series Code:

SN: SXXXXXXXX2401100001

Series Code description

No.	Referring to	Code	Description
1	Brand name	S	astonishing
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	

Hardware Version:A02

Software Version:V1.09

3.2 Working Mode

The HL8-15K-P2SA 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] Balance	In this mode, users can set the time period, photovoltaic sufficient and time-of-use price area, in the case of large power consumption of users, to achieve the balance of photovoltaic utilization rate and economic benefits. **Peak price:**Run spontaneous self-use mode. **Flat price:**The photovoltaic gives priority to the load power supply, and when the photovoltaic power is insufficient, the battery is restricted to discharge to ensure the continuity of energy. **Valley price:**Charge the battery at full power priority until it is full.
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.

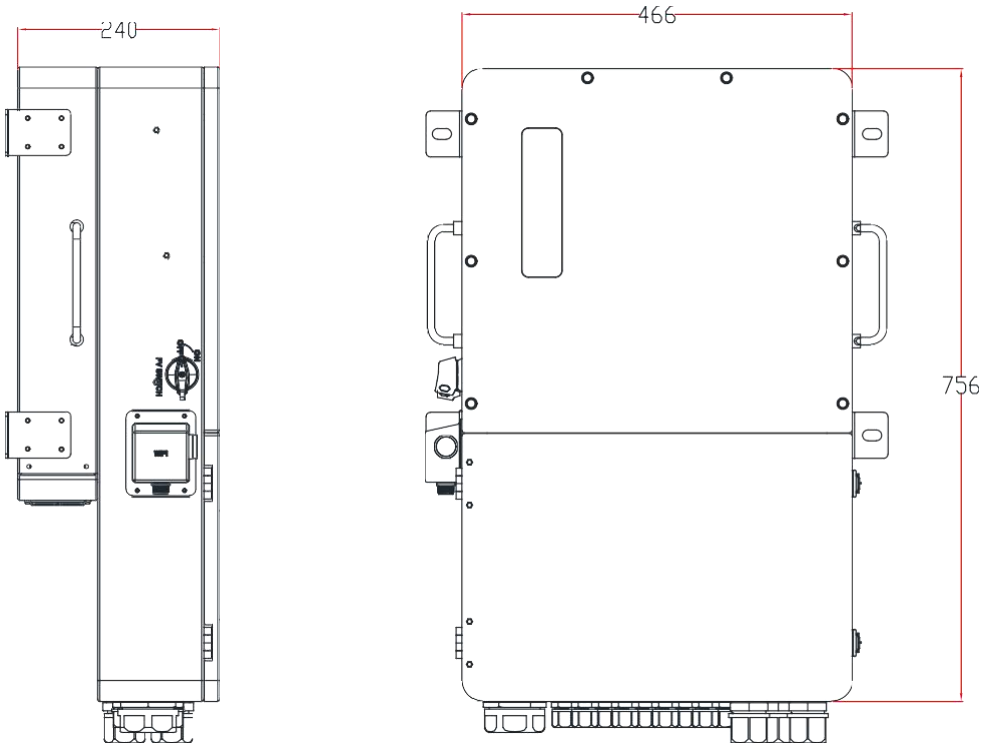
1.TOU means time of use.

DANGER

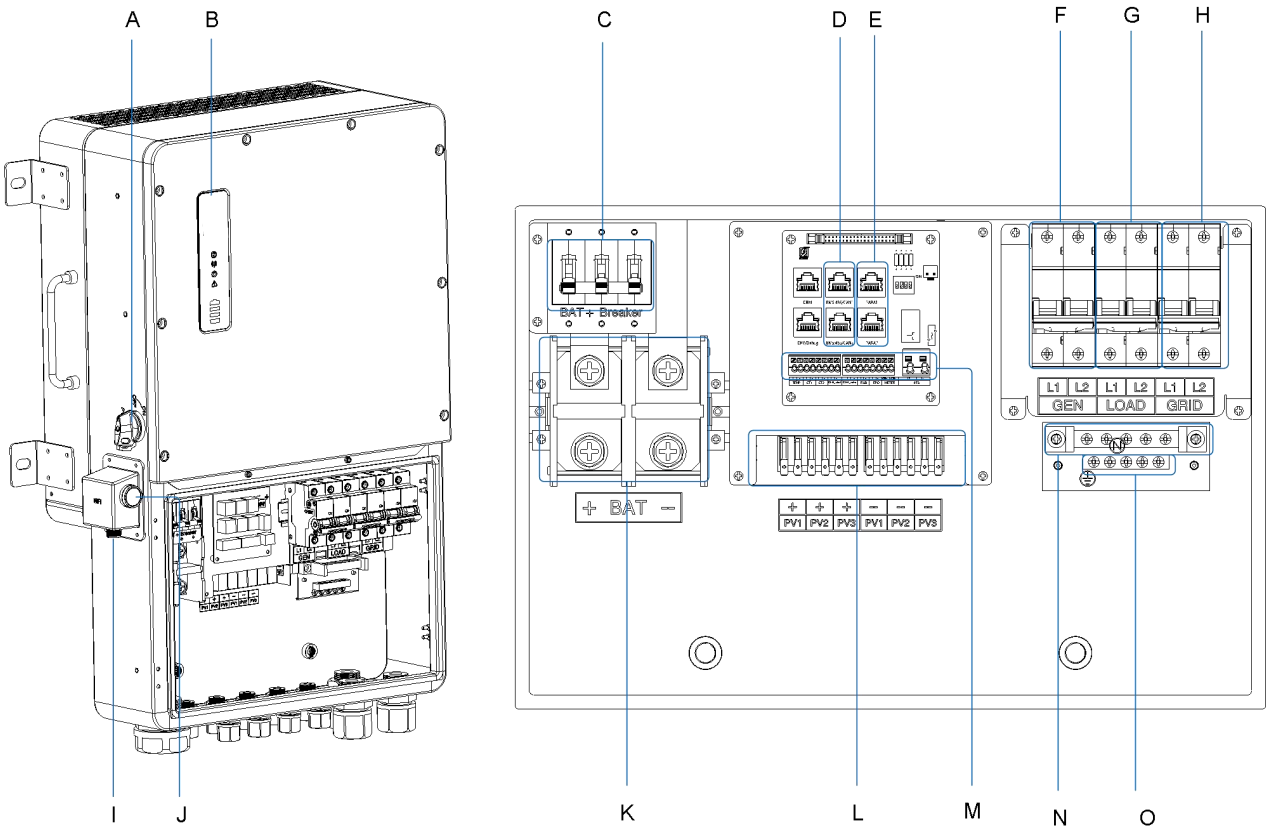
Make sure the load powering rating in within the EPS's output rating. Or the inverter will shut down with an 'over load' warning.When an “over load” is appeared, adjust the load power make sure it is with the range of the EPS output, and turn the inverter on.For the nonlinear load, please pay attention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

3.3 Appearance

3.3.1 Dimensions



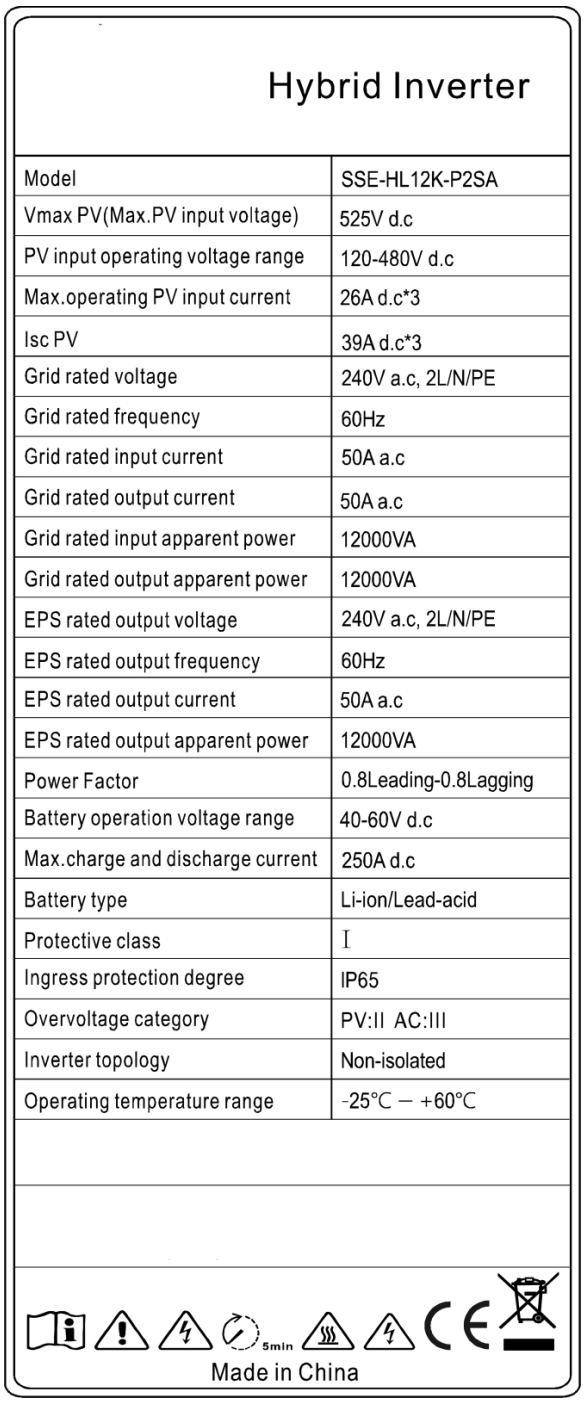
3.3.2 General Description



Component	Name	Component	Name
A	PV DC disconnect	**I**	WiFi dongle
B	LED display	**J**	ON/OFF button
C	300A battery breaker	**K**	Battery terminal
D	BMS RJ45 ports（RS485/CAN ）	**L**	3*PV Inputs
E	Parallel RJ45 ports	**M**	Input pinouts for sensors & accessories
F	Generator breaker	**N**	Neutral busbar
G	LOAD breaker	**O**	Ground busbar
H	Grid breaker		

3.3.3 Nameplate

The nameplate is for reference only.



Hybrid Inverter

Model	SSE-HL12K-P2SA
Vmax PV(Max.PV input voltage)	525V d.c
PV input operating voltage range	120-480V d.c
Max.operating PV input current	26A d.c*3
Isc PV	39A d.c*3
Grid rated voltage	240V a.c, 2L/N/PE
Grid rated frequency	60Hz
Grid rated input current	50A a.c
Grid rated output current	50A a.c
Grid rated input apparent power	12000VA
Grid rated output apparent power	12000VA
EPS rated output voltage	240V a.c, 2L/N/PE
EPS rated output frequency	60Hz
EPS rated output current	50A a.c
EPS rated output apparent power	12000VA
Power Factor	0.8Leading-0.8Lagging
Battery operation voltage range	40-60V d.c
Max.charge and discharge current	250A d.c
Battery type	Li-ion/Lead-acid
Protective class	I
Ingress protection degree	IP65
Overvoltage category	PV:II AC:III
Inverter topology	Non-isolated
Operating temperature range	-25℃ ~ +60℃

5min

Made in China

3.3.4 Specification

Model	HL8K-P2SA	HL10K-P2SA	HL12K-P2SA	HL15K-P2SA
Product Type	Hybrid Inverter			
Input(PV)				
Max. power	12 kW	15 kW	18 kW	22.5 kW
Max. DC voltage	525 V d.c.			
MPPT voltage range	120~480 V d.c.			
Full Power MPPT voltage	120~480 V d.c.	125~480V d.c.	145~480 V d.c.	195~480V d.c.
Max.input current of single MPPT(Ad.c.)	26+26+26			
MPPT tracker/strings	3/2+2+2			
Grid AC input and AC output				
Grid Rated output active power	8 kW	10 kW	12 kW	15 kW
Grid Max. output active power	8 kW	10 kW	12 kW	15 kW
Max. output current	33.4 A a.c.	41.7 A a.c.	50 A a.c.	62.5 A a.c.
Grid voltage/range	120Vac / 240Vac（Split phase），208Vac（2/3 phase）			
Frequency	50 / 60（+5Hz）			
Power Factor	0.8lagging-0.8leading			
THDi	<3%			
AC output topology	2L / N / PE			
Grid electrical supply system	TN, TT			
Battery				
Battery voltage range	40~60 V d.c.			
Max. charging voltage	60 V d.c.			
Rated battery voltage	51.2 V d.c.			
Max.charge/discharge Power	8 kW	10 kW	12 kW	12 kW
Rated. charge/discharge current	167 A d.c.	210 A d.c.	250 A d.c.	250 A d.c.
Max. charge/discharge current	167 A d.c.	210 A d.c.	250 A d.c.	250 A d.c.
EPS output				
EPS rated output active power	8 kW	10 kW	12 kW	15 kW
EPS Max. output active power	8 kW	10 kW	12 kW	15 kW
Rated output voltage	120Vac / 240Vac（Split phase），208Vac（2/3phase）			
Max. output current	33.4 A a.c.	41.7 A a.c.	50 A a.c.	62.5 A a.c.
Rated frequency	50 / 60 Hz			
Automatic switching time	< 10 ms			
THDu	< 2%			
Overload capacity	200% 10s			

General Parameter	HL8K-P2SA	HL10K-P2SA	HL12K-P2SA	HL15K-P2SA
DC Max. efficiency	97.50%			
California-efficiency	96.50%			
MPPT efficiency	99.50%			
Ingress protection	IP 65			
Overvoltage Category	AC: III, PV: II			
Protection class	I			
Pollution degree	PD3			
Noise emission	<45 dBA			
Operation temperature	- 25℃～ 60℃(linely derating to 60% when exceed +45 to +60 °C)			
Cooling	Intelligent Air Cooling			
Relative humidity	0 ~95% (non-condensing)			
Operating altitude	4,000m (>2,000 Derating)			
Isolation transformer	Non-Isolated			
Self-consumption	<25 W			
Dimension (W*H*D)	466*756*240mm			
Net Weight	45 kg			
Display and communication				
Display	LED / APP			
Communication	RS485/Wifi/4G/Bluetooth/LAN/CAN /Meter Yes/ Yes/ Opt/Opt/Opt/ Yes /Opt			
Cetificate and standard				
Cetificate	CE、RCM			
Grid-interactive standard	IEC62116			

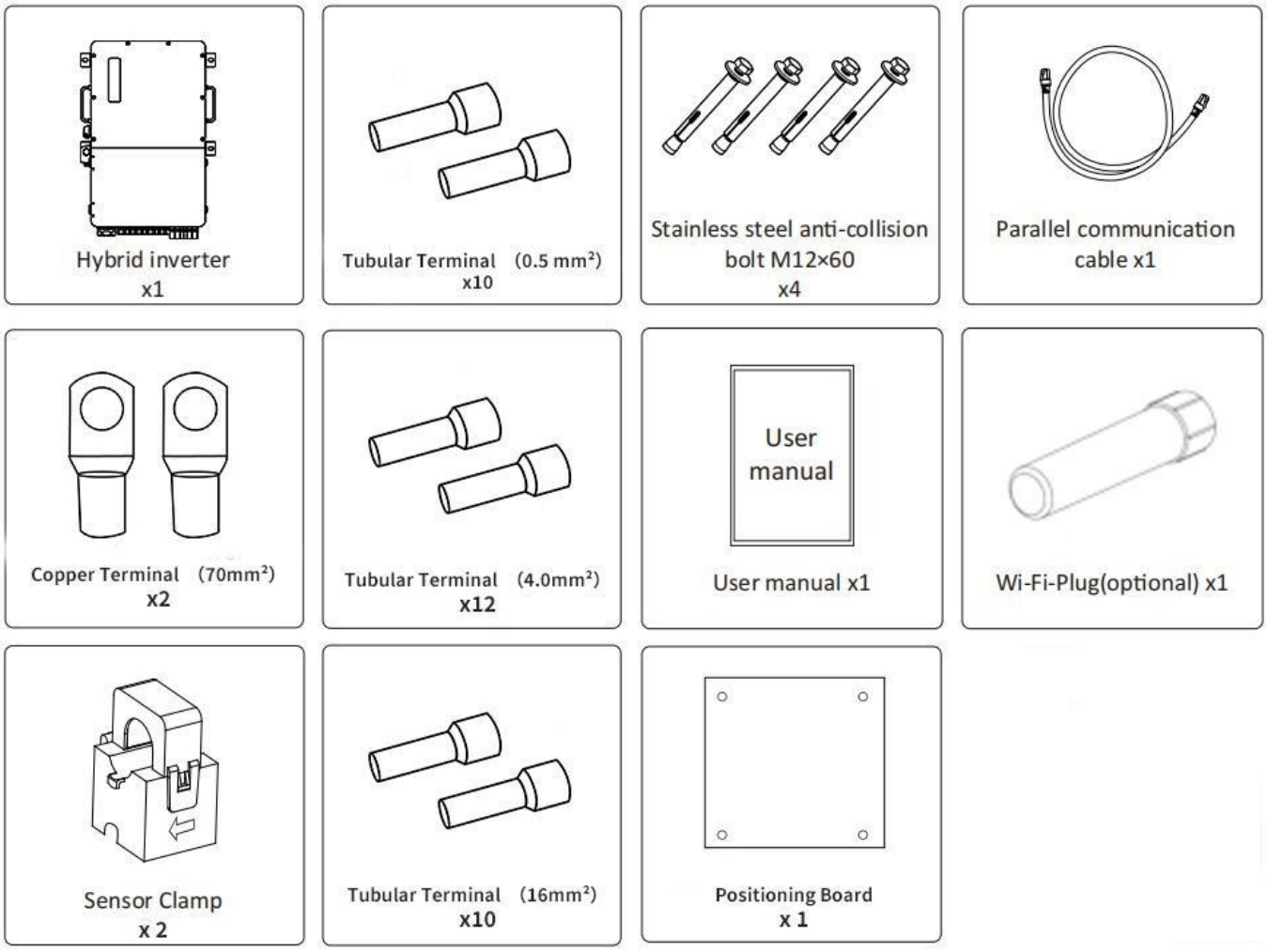
4. Check and Storage

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?

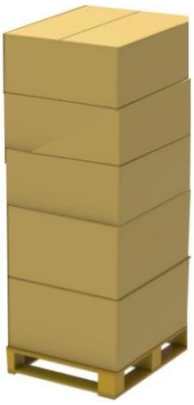


4.3 Storage

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.



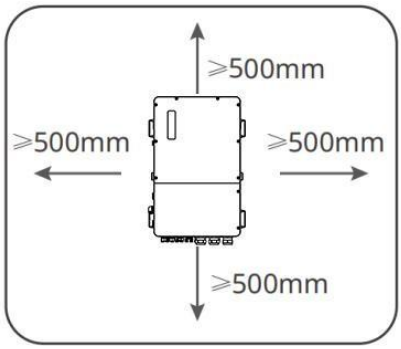
5. Installation

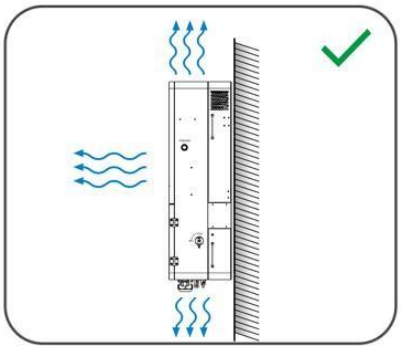
5.1 Installation Requirements

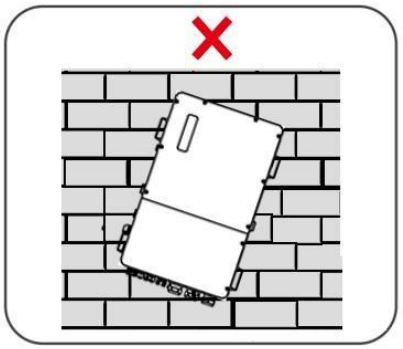
Installation Environment Requirements

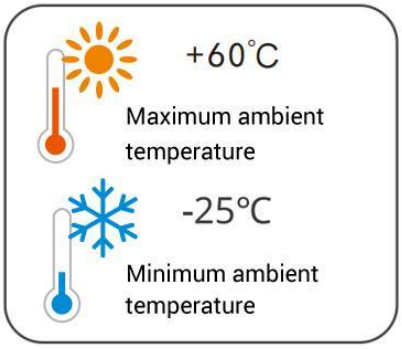
1. Do not install the equipment in a place near flammable, explosive, or corrosive materials.
2. Do not install the equipment in a place that is easy to touch, especially within children's reach. High temperature exists when the equipment is working. Do not touch the surface to avoid burning.
3. Avoid 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 overcurrent protection (such as a breaker rated 400V a.c /63 A a.c) before AC input and after LOAD 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:

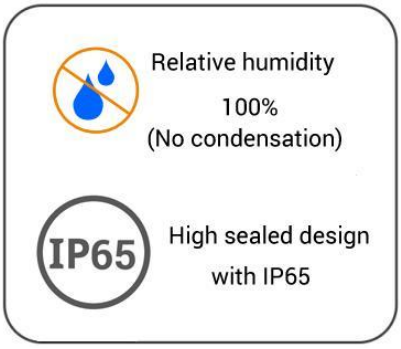
• Add a multi-turn winding ferrite core at the DC input line or AC output line of the inverter,
or add a low-pass EMI filter.
• The distance between the inverter and the wireless EMI equipment is more than 30m.

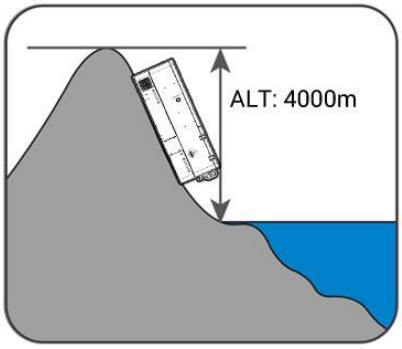

≥500mm
≥500mm
≥500mm
≥500mm



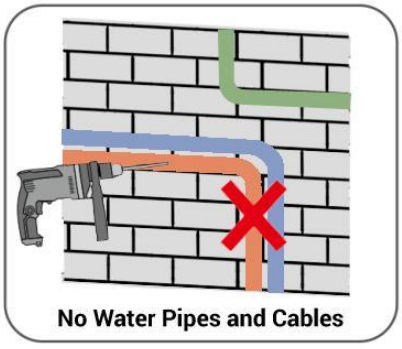


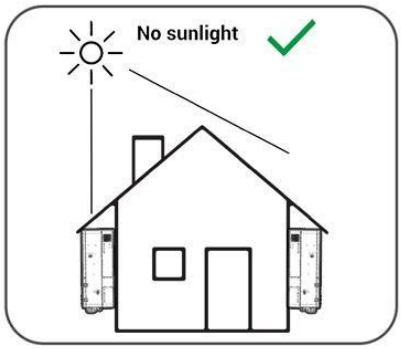

+60°C
Maximum ambient temperature
-25°C
Minimum ambient temperature

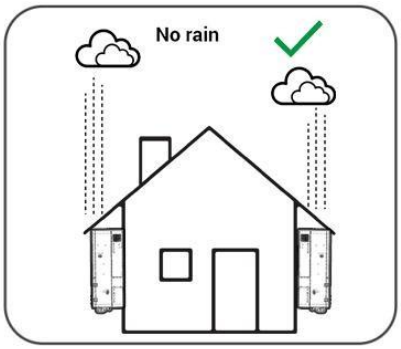

Relative humidity
100%
(No condensation)
IP65
High sealed design with IP65

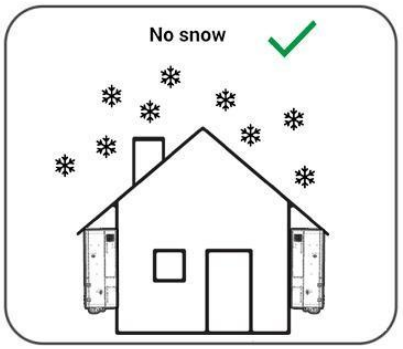

ALT: 4000m

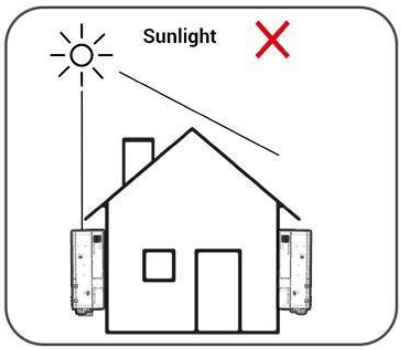

Children No Reach

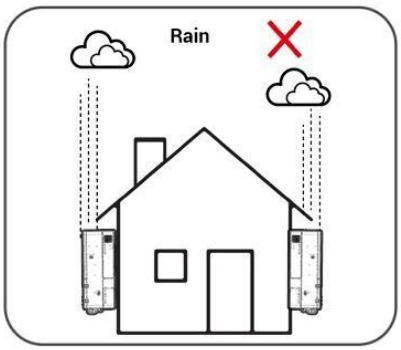

No Water Pipes and Cables

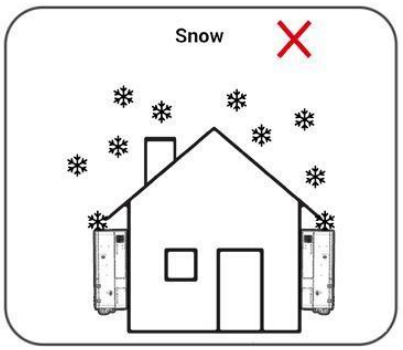

No sunlight


No rain


No snow

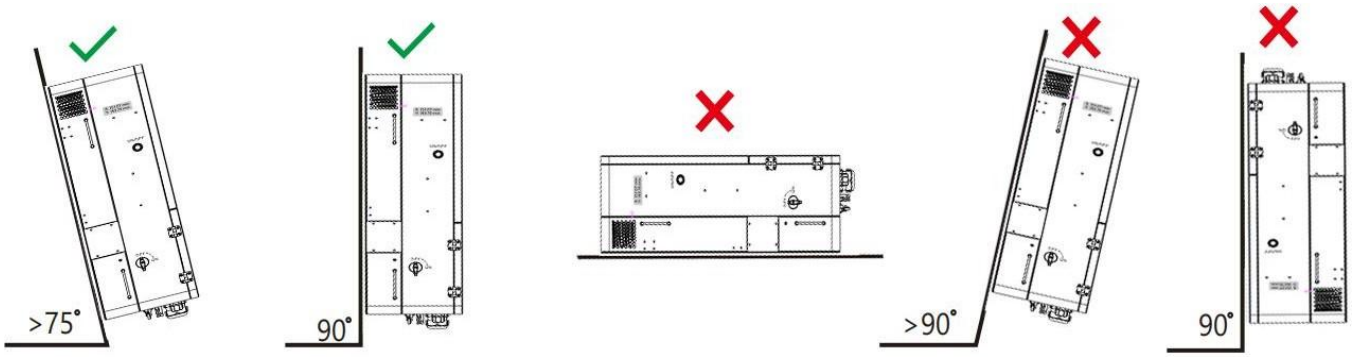

Sunlight


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

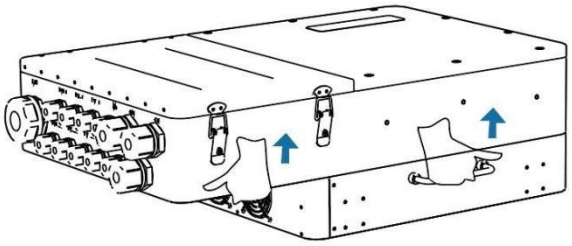
The following tools are recommended when installing the equipment. Use other auxiliary tools on site if necessary.

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 lEC62109-1. 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

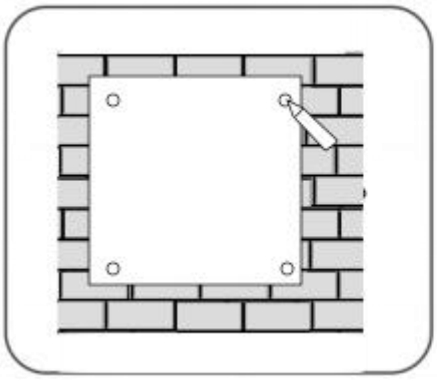
NOTICE

•Avoid the water pipes and cables buried in the wall when drilling holes.

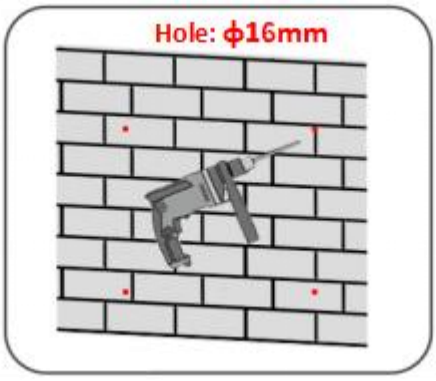
•Wear goggles and a dust mask to prevent the dust from being inhaled or contacting eyes when drilling holes.

•Make sure the inverter is firmly installed in case of falling down.

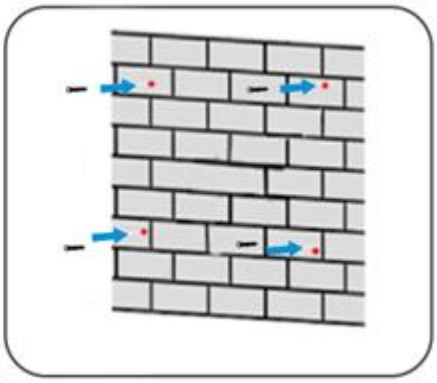
Step 1 : Attach the positioning paper to the wall.
Step 2 : Drill holes according to the marked positions on the positioning paper.
Step 3 : Install the expansion bolts.
Step 4 : Hang the inverter onto the expansion bolts.
Step 5: Install the nuts.



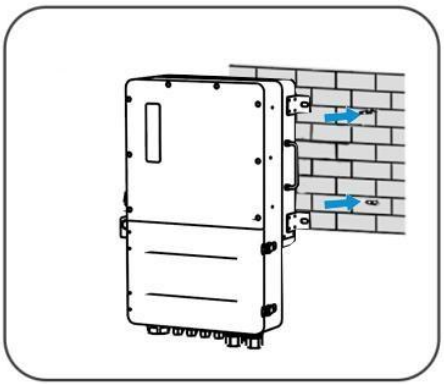
Step 1



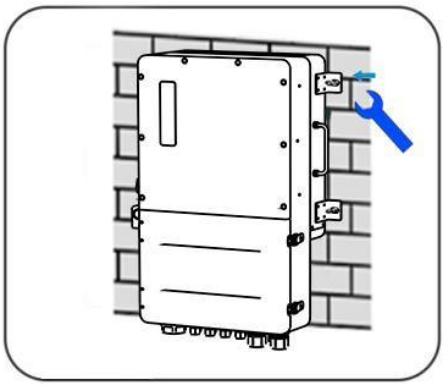
Step 2



Step 3



Step 4



Step 5

6. Electrical Connection

6.1 Safety Precaution

DANGER

•All operations, cables and parts specification during the electrical connection s hall 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.

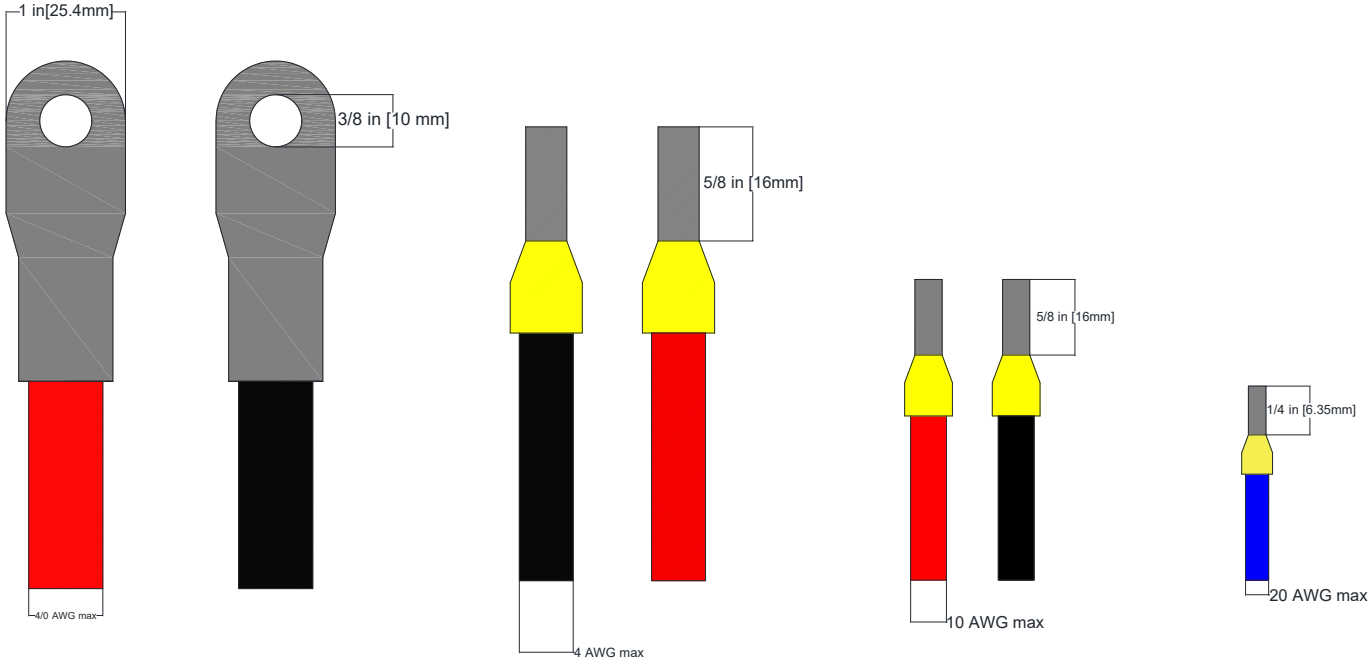
6.2 Connection Requirements

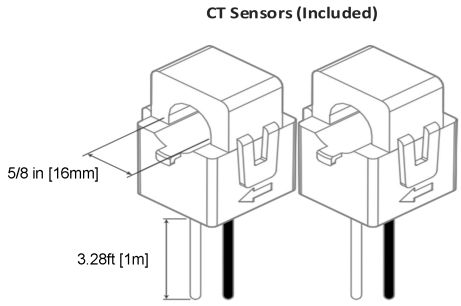
6.2.1 AC / DC Connection Requirements

Port	Terminal / Breaker Rating	Terminal Wire Size Range (min-max)
GRID	63A AC(8-12kW) 100A AC(15kW)	6 – 4 AWG
LOAD	63A AC(8-12kW) 100A AC(15kW)	6 – 4 AWG
GEN	63A AC(8-12kW) 100A AC(15kW)	6 – 4 AWG
MPPT	32A DC	12 – 10 AWG
Battery Port	250A DC	2/0 – 4/0 AWG

6.2.2 Sensors and Communications Requirements

Component	Wire Size Range	Max Distance
CT Sensor	16-20 AWG	0’ – 13’ [4 m]: 16 AWG included 13’ – 20’ [6 m]: CAT6 extendable
Communications	24 – 23 AWG	0’ – 100’ [30 m]: 24 AWG 100’ – 400’ [120 m]: 23 AWG
RJ45 Parallel Communication	CAT 5E or better	0’ – 7’ [2.1 m]: Included 7’ – 20’ [6m]: Extendable



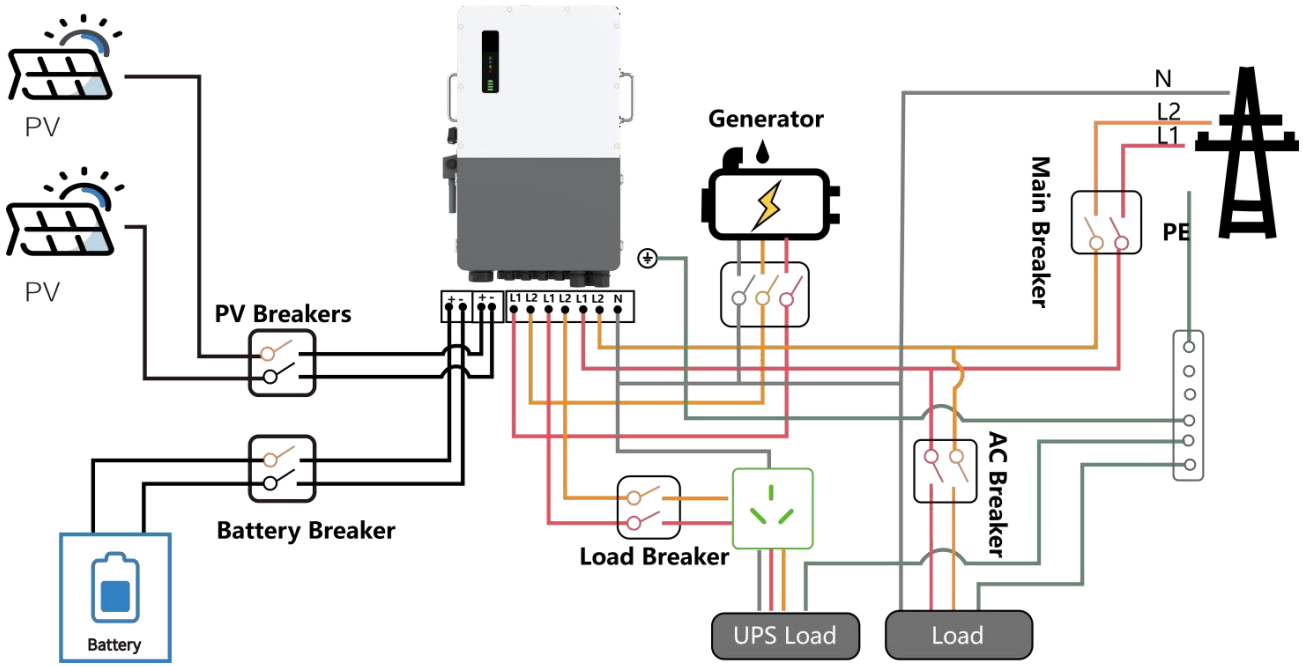


6.2.3 Connection Port Description

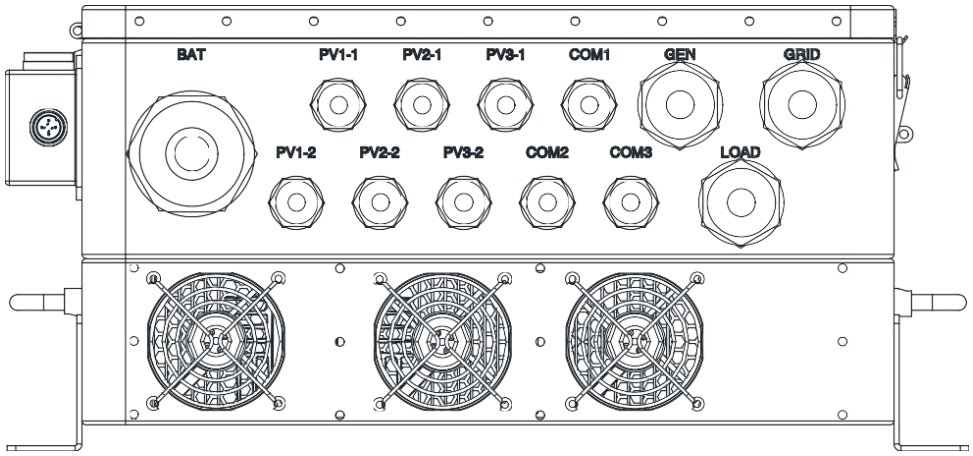
Connector	Description		Recommend cable type	Recommended Cable specifications
PV1-1 PV1-2	+：Connect the positive electrode of photovoltaic cell		Industry common outdoor Photovoltaic cable	Conductor cross-sectional area: **12 – 10 AWG**
	-：Connect the negative electrode of photovoltaic cell			
BAT	+：Connect the positive electrode of lithium battery		Outdoor multi-core copper cable	Conductor cross-sectional area: **2/0 – 4/0 AWG**
	-：Connect the negative electrode of			
LOAD	Load(EPS)	L1	Outdoor multi-core copper cable L1/L2: Brown/Red/Green or Yellow Wire N: Blue/Black Wire PE: Yellow & Green Wire	Conductor cross-sectional area: **6 – 4 AWG**
		L2		
		N		
		PE		
GRID	Grid(AC)	L1	Outdoor multi-core copper cable L1/L2: Brown/Red/Green or Yellow Wire N: Blue/Black Wire PE: Yellow & Green Wire	Conductor cross-sectional area: **6 – 4 AWG**
		L2		
		N		
		PE		
GEN	Generator	L1	Outdoor multi-core copper cable L1/L2: Brown/Red/Green or Yellow Wire N: Blue/Black Wire PE: Yellow & Green Wire	Conductor cross-sectional area: **6 – 4 AWG**
		L2		
		N		
		PE		
WIFI	WiFi			

6.3 System Integration

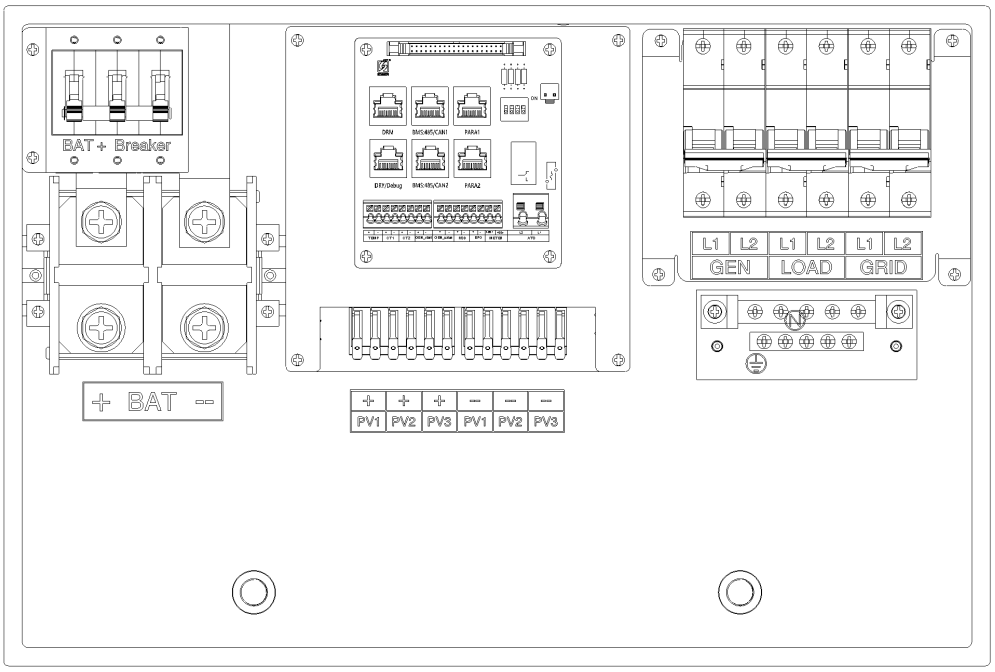
The system connection diagram is as follows (S.A. version):

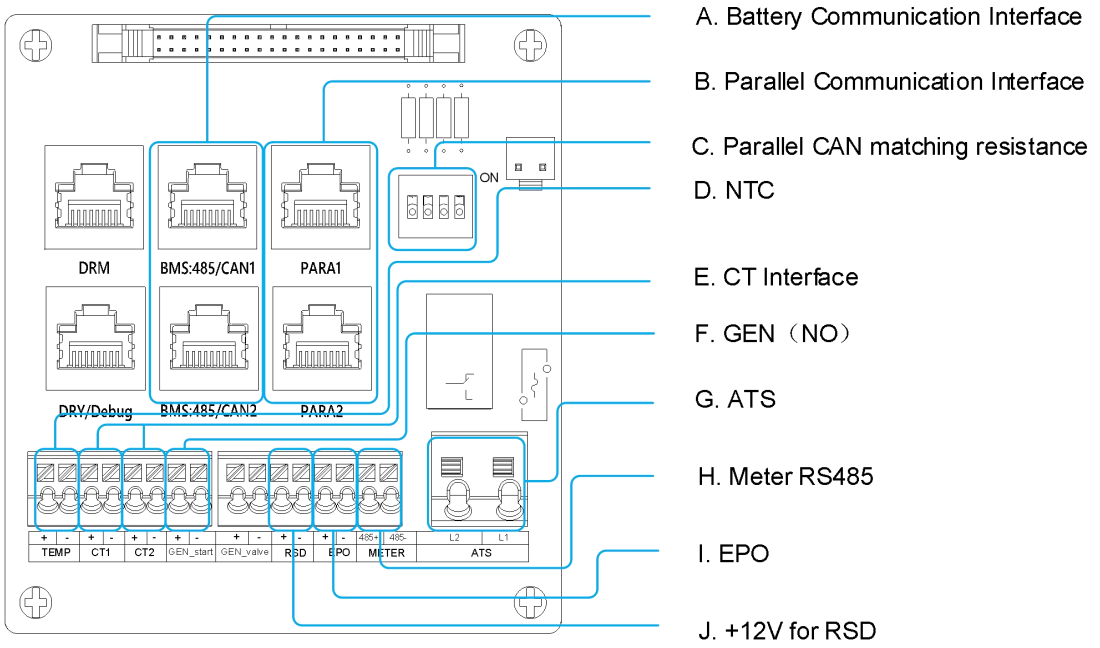


Overview of Connection Ports



Overview of Cable Box





A. Battery Communication port（CAN&485）：please check Chapter 6.7.4 for Pin definition.

B. Parallel Communication port（CAN&485）：please check Chapter 6.7.4 for Pin definition.

C. Parallel CAN matching resistance：Set DIP Switch when use inverters in Parallel.

D. NTC：Connection for temperature sensor of Lead acid battery.

E. CT Interface：please check Chapter 6.7.4 for Pin definition.

F. GEN(NO): Connection for generator auto-start function. dry contact signal for startup the diesel generator. When the "GEN signal" is active, the open contact (GS) will switch on (no voltage output).

G. ATS: 240V output port when inverter is on.

H. Meter RS485 :for meter communication.

I. EPO : Reserved for external EPO.

J. +12V for RSD : Power supply for RSD PLC transmitter(Max current 500mA).

6.4 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

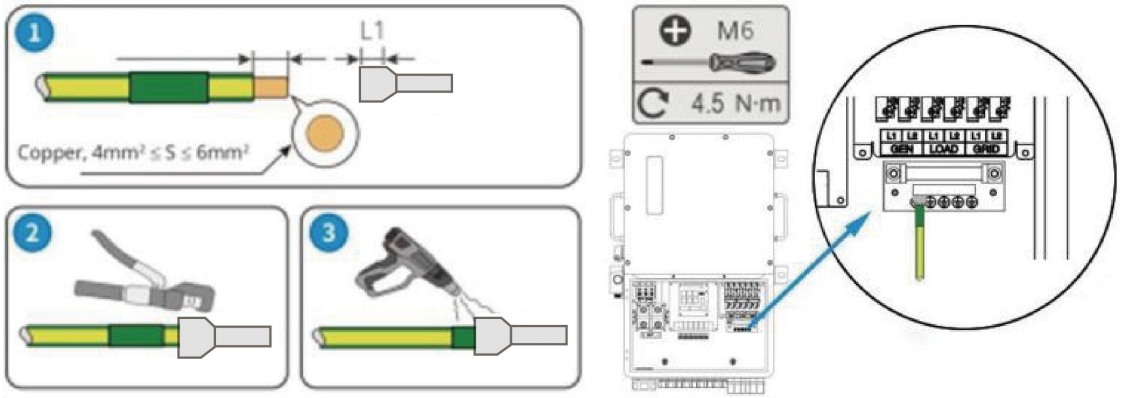
• Make sure that all the grounding points on the enclosures are equipotential connected when there are multiple inverters.

• 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)



6.5 PV Connection

The photovoltaic connection of this hybrid inverter is the same as that of a traditional grid-tied solar inverter (string inverter).

Warning

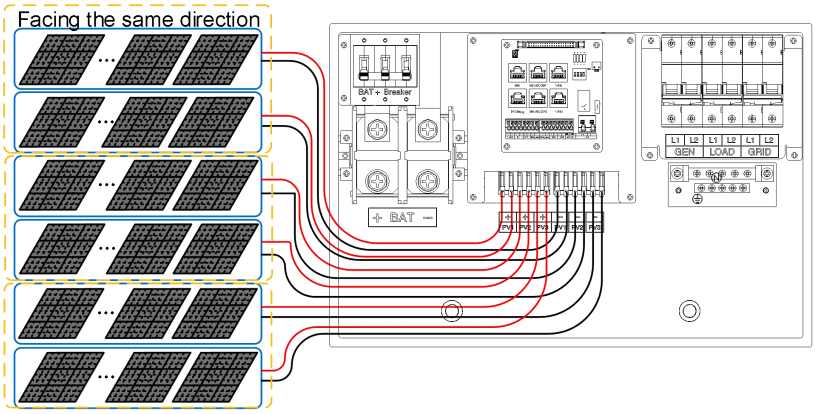
Please double-check the minimum ambient temperature at the installation location. The thermal Voc on the solar panel nameplate is measured at 25°C. As the ambient temperature decreases, the solar panel Voc increases. Ensure that the maximum solar string voltage, corrected for the lowest temperature, does not exceed the inverter's maximum input voltage of 525V.

Note

- The inverter has three MPPTs. For each MPPT, the user can connect two strings of solar panels.

- When the user connects two strings to the same MPPT, ensure that the number of solar panels in each string is the same, and that the installation location and orientation are as consistent as possible. The inverter will automatically limit the total input current of each MPPT to 26A.

- The inverter limits the maximum solar input power to 22.5kW.



PV Connection Steps

a. Strip 1/4-5/16 inch (6-8mm) of insulation from the positive and negative conductors of the PV string.

b. If the PV string wires are stranded, use wire ferrules.

c. Insert the conduit connector into the PV connection port.

d. Pass the photovoltaic conductors through the conduit fittings and insert them into the inverter.

e. Confirm that the cable connections are correct and secure. Then take appropriate measures to ensure that the conduit and conduit fittings are properly tightened and sealed into the cable hole.

6.6 Battery Connection

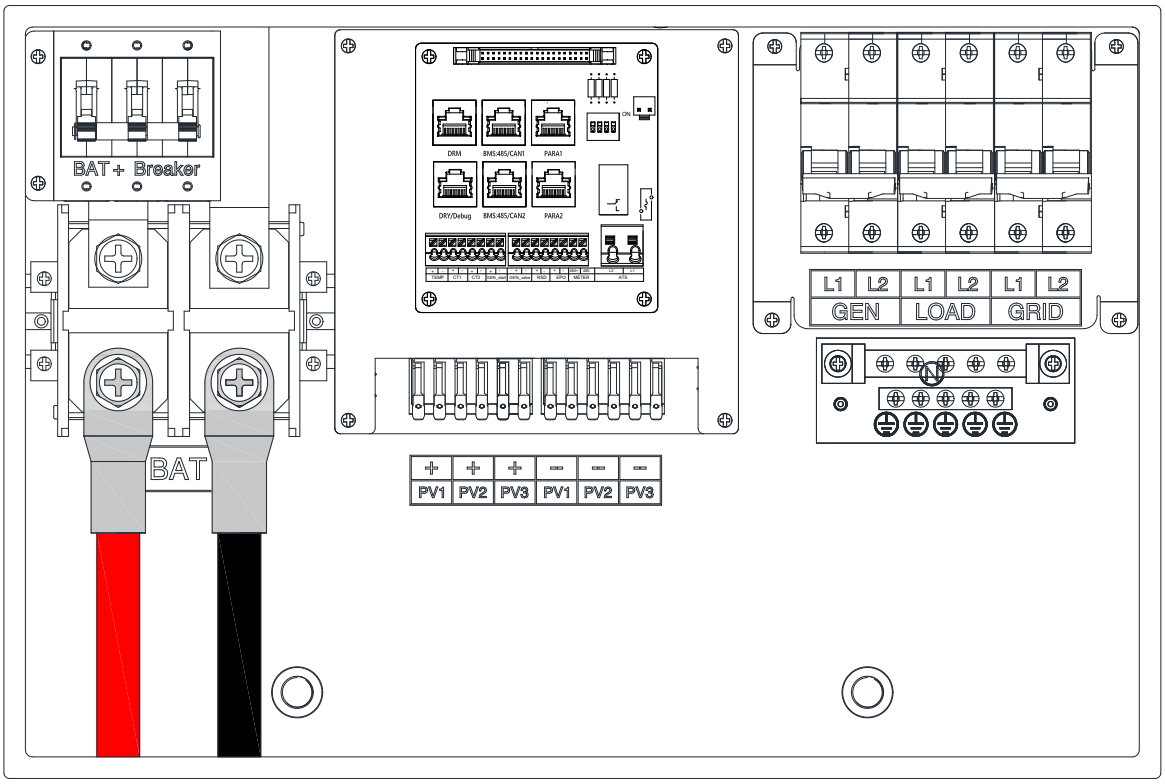
6.6.1 Battery Power Cable Connection

Step 1: Strip 1/4 ~ 5/16 inch (6 ~ 8mm) of insulation from the cable ends and crimp the OT rings.

Step 2: Lay the battery power cables, connecting the positive terminal to BAT+ and the negative terminal to BAT-.

Step 3: Use the reverse nut to secure the conduit fittings to the enclosure.

Step 4: Secure the OT rings of the battery positive and negative cables onto the terminal block according to the markings.



Warning

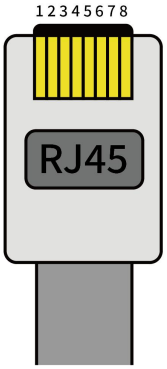
Reverse polarity will damage the inverter!

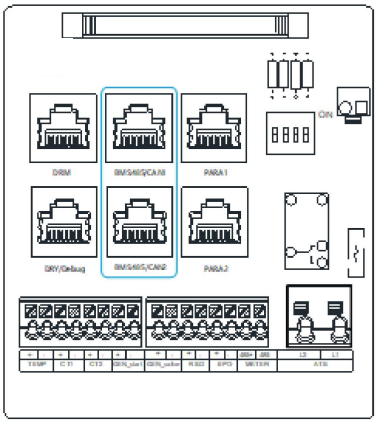
Before connecting or disconnecting the battery, ensure that the built-in battery circuit breaker is in the "off" position.

6.6.2 Battery Communication Cable Connection

When the user selects the lithium-ion battery type, the correct battery communication cable must be used to connect the battery to the inverter. If the lithium battery cannot communicate with the inverter, please select the "lead-acid" type. The inverter's battery communication port is an RJ45 socket, and the pins of the RJ45 connector are as follows. Create the communication cable according to the correct pins of the inverter and the battery communication port. The inverter supports both CAN and RS485 communication.

Pin	Description
1	BAT RS485 A
2	BAT RS485 B
3	NC
4	BAT CAN H
5	BAT CAN L
6	NC
7	BAT RS485 B
8	BAT RS485 A





After the battery socket and communication socket are connected, you need to enter the advanced settings in the inverter's app to change the battery type and brand. After selecting the appropriate battery protocol, communication will be established within 1-2 minutes.

Note

Lithium-ion Batteries

1. Ensure that the lithium-ion battery used is compatible with the inverter. Please contact your distributor for the latest battery compatibility list.
2. If multiple battery modules are used with the inverter, the inverter communication cable must be connected to the master battery. Please consult the battery supplier for the configuration of the master and slave batteries. Customers can refer to Appendix 2 for detailed definitions of lithium battery brands.

For Lead-Acid Batteries

1. The temperature sensor for lead-acid batteries is optional. If needed, please contact your distributor to purchase one.
2. Charging of lead-acid batteries is done in three stages. Please refer to the Charging/Discharging Settings page for related parameters.

6.7 Grid&EPS Load Connection

6.7.1 Grid Type and Regulation Selection

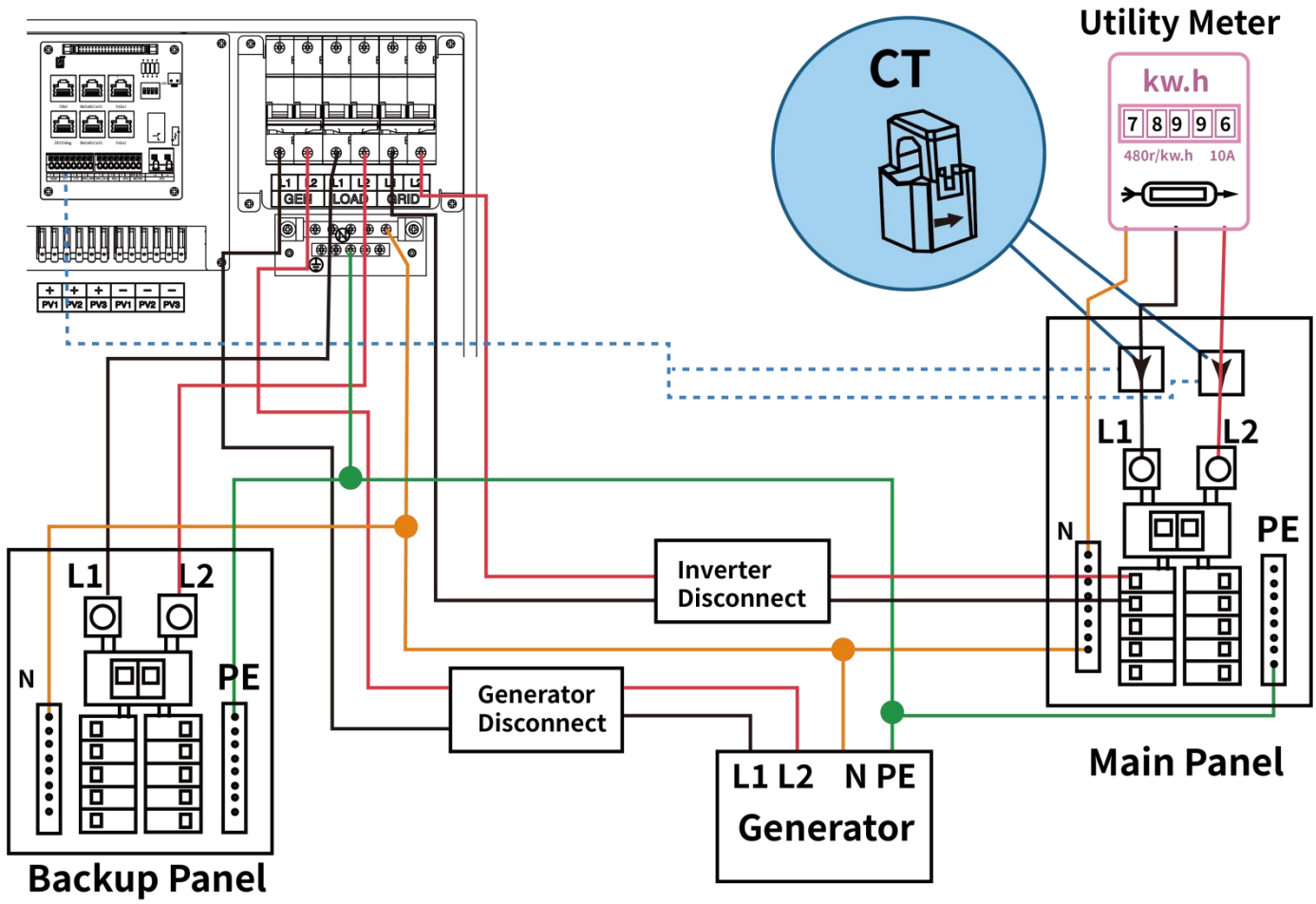
This inverter can be used with 120/240V split-phase or 120/208V split-phase systems. If connecting to the grid, ensure that the grid settings are configured correctly. The user can select different grid types and regulations in the advanced settings of the app, as shown in the following diagram.

6.7.2 Split-phase Grid and EPS Load Connection

The wiring diagram for 120/240V is shown below: The wiring diagram for the 120/208V split-phase service is largely the same, except it does not support a generator.

When the main panel bus rating meets the NEC705.12(B)(3) requirements, the inverter can be connected to the load side of the service disconnecting device. Otherwise, a line-side connection can be made to avoid the costly upgrade of the main panel.

Grid and EPS Load Connection



6.7.3 AC Cable Connection

Strip 5/16-3/8 inch (8-10mm) of insulation from the cable.

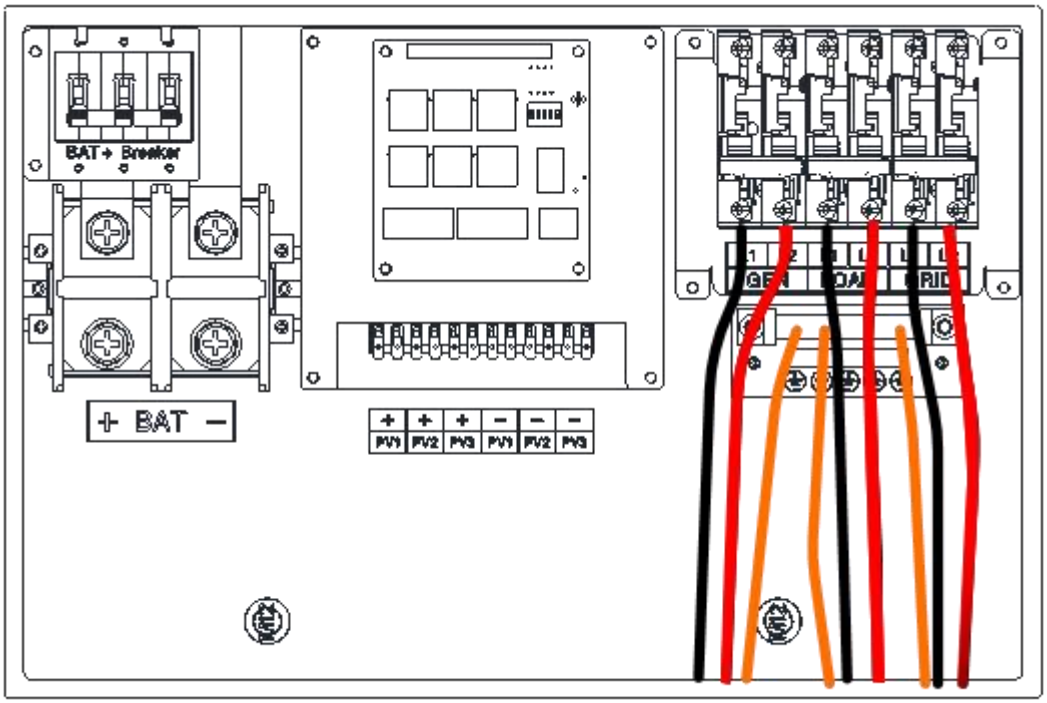
a. If the cable is stranded, use a cable sheath.

b. Secure the conduit fitting to the enclosure using the top nut of the fitting.

c. Secure the grid line and EPS load line onto the terminal block according to the markings.

d. Fix the conduit onto the conduit fitting.

e. Check that the cable connections are correct and secure. Take appropriate measures to ensure that the conduit and conduit fittings are properly tightened and sealed into the cable entry hole.



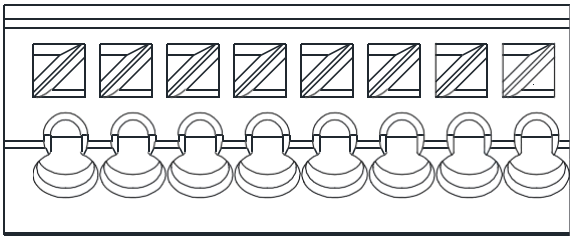
Warning

Before supplying power to the EPS load, ensure that the built-in load circuit breaker is in the "ON" position.

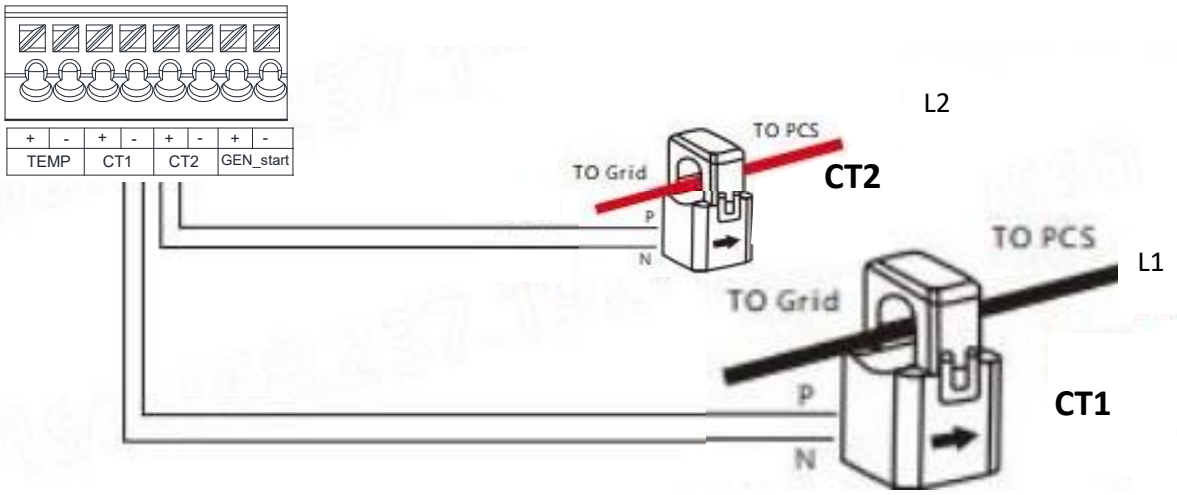
6.7.4 CT / Energy Meter Connection

To measure the input and output grid power, a pair of CTs or a three-phase meter must be installed at the service entrance point, either inside or near the main service panel. We standardly supply 2 CTs for one inverter.

CT Interface Pin Definition



+	-	+	-	+	-	+	-
TEMP		CT1		CT2		GEN_start	



Please refer to the wiring diagram to determine the correct placement of the CTs. Attach the two CTs to the L1 and L2 lines at the service entrance point of the main service panel.

- **CT1** (labeled L1) should be placed on **L1**.
- **CT2** (labeled L2) should be placed on **L2**.
  The arrow on the CT should point towards the inverter.

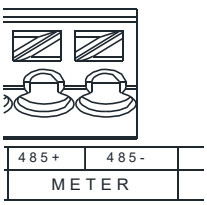
(**Incorrect installation of the CTs may result in incorrect readings on the display and may prevent the inverter from functioning properly.**) If the CT is installed in the wrong direction, there is an option to reverse the direction in the inverter settings: **CT Direction Reversal** (only applicable if the CT1 or CT2 is not installed correctly). This can be done in the **Advanced Settings** tab. However, you should not need to change this if the CTs are installed correctly.

CT Clamping Ratio

The inverter supports a 1000:1 ratio. The CT in the accessory package has a 1000:1 ratio. If you are using a third-party CT, ensure that the CT ratio is 1000:1, and select the correct CT ratio setting on the inverter's monitoring page or LCD display.

Energy Meter Connection

If you need to use an energy meter for import/export monitoring instead of using CTs, it should be connected to the **485A** and **485B** terminals on the inverter for communication. These terminals support RS48



6.8 Use a Generator

6.8.1 Generator System Connection

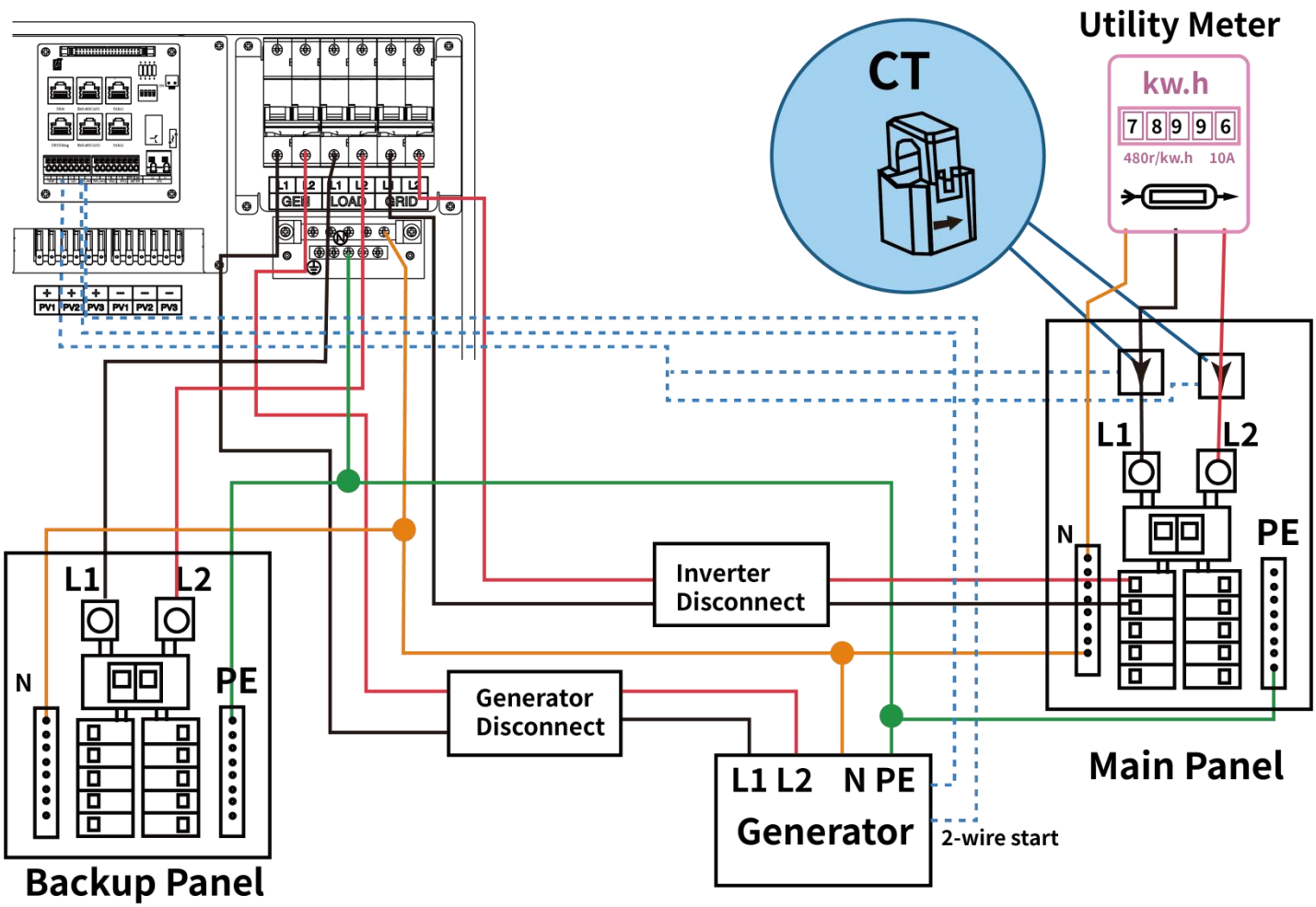
This hybrid inverter can be used with a generator. The inverter has a **Gen** port for connecting the generator.

Stator Requirements:

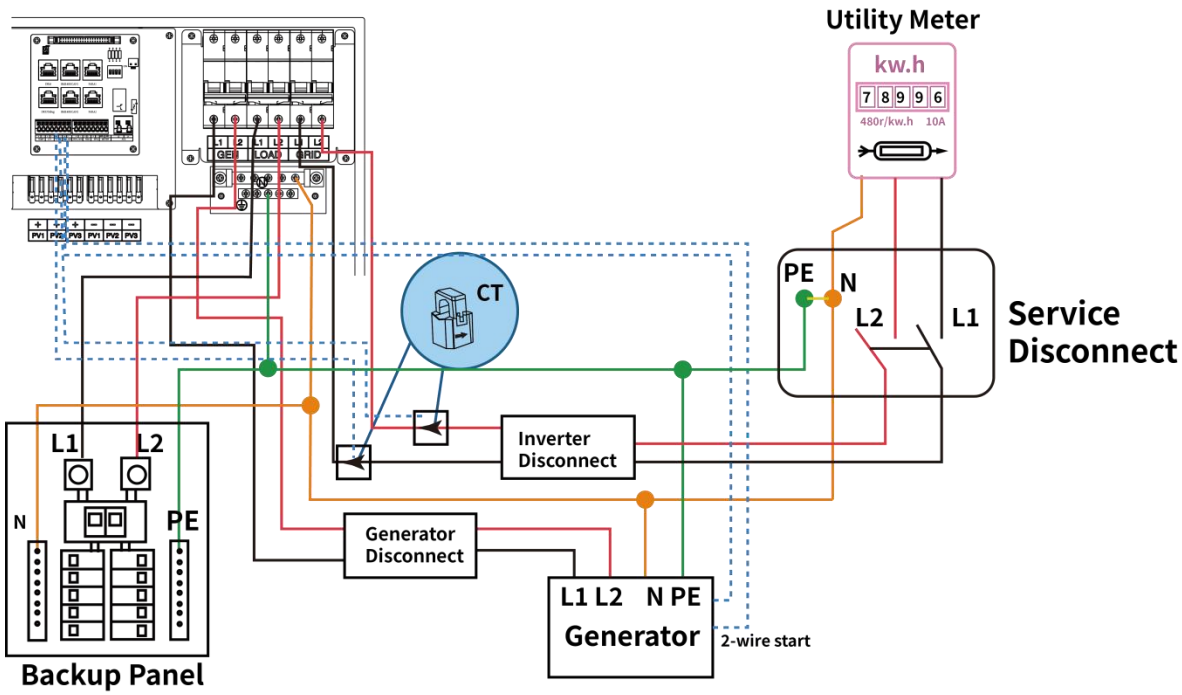
The generator should use a **neutral-grounding connection** and provide both **240V/120V output**. The generator's capacity may be greater than the current system capacity.

Make sure the generator is correctly connected and meets the voltage and capacity requirements to ensure proper operation with the inverter. Always follow the manufacturer's guidelines for installation and connection.

Generator Connection-Partial Backup



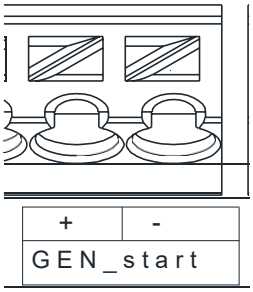
Generator Connection-Whole Home Backup



When the generator starts, all loads connected to the EPS will be powered by the generator, and the battery will be charged simultaneously.

The AC circuit breaker on the **Gen** port is rated for 63A. When the generator is running, ensure that the total load and charging current do not exceed 63A.

If the user requires remote starting of the generator, the generator start signal should be connected to the **GEN_start** port on the I3 board.



6.8.2 Generator Start and Stop Settings

These conditions depend on the **Battery (Bat) Operation Mode** settings. The system uses the **battery's State of Charge (SOC)** or **battery voltage** to determine whether the generator needs to start or stop.

Generator Start Conditions:

The generator will start under the following circumstances:

Power failure: When there is a loss of grid power or other power sources.

Battery discharge cutoff: When the battery discharges to the cutoff voltage or SOC setting.

Forced charging requirement: If there is a need for forced charging of the battery.

Battery voltage or SOC below the generator start threshold: If the battery voltage or SOC falls below the set **generator charging start voltage/SOC**.

Generator Stop Conditions:

The generator will stop under the following conditions:

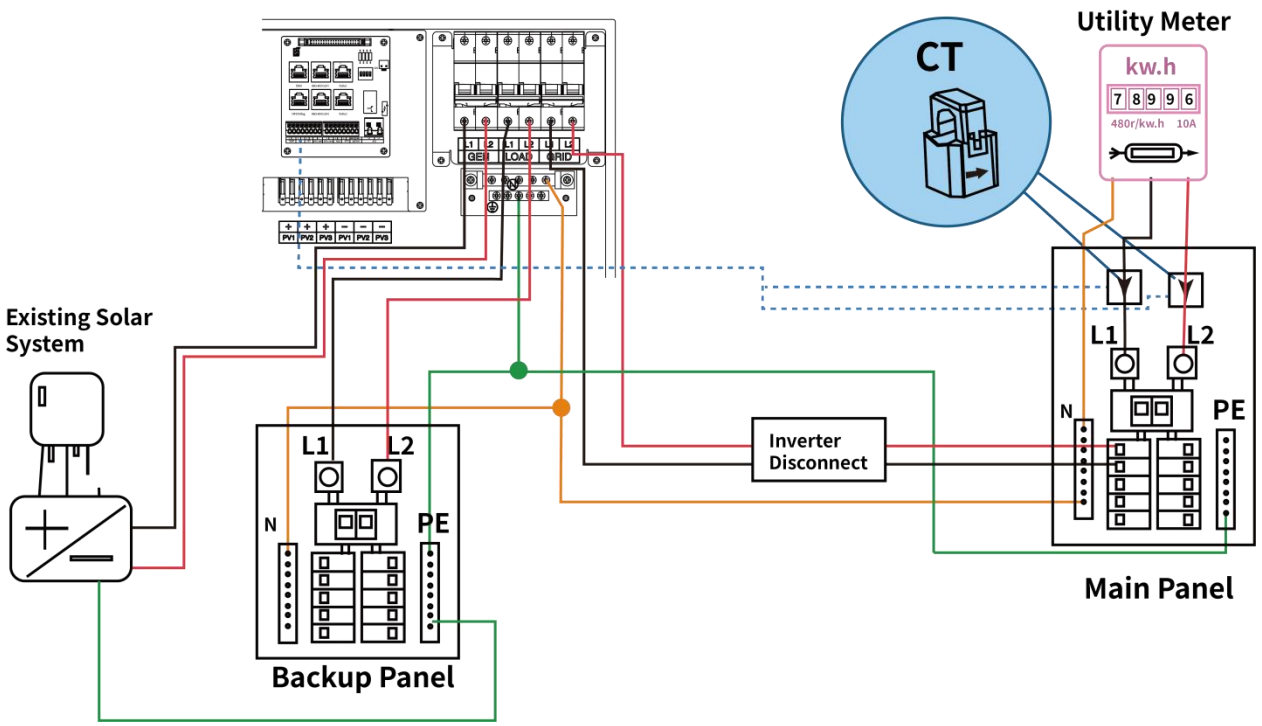
When the **battery voltage** or **SOC** is higher than the **charging endpoint voltage/SOC** setting, meaning the battery is sufficiently charged and the generator is no longer needed.

By using these settings, the system ensures the generator only operates when necessary, optimizing battery performance and reducing unnecessary generator run time.

6.8.3 AC Coupling Installation and Connection

The inverter supports AC coupling with an existing grid-tied solar system. The existing solar system is connected to the **GEN** port on the inverter.

Connection for AC coupled solar system



When the **"Grid"** is in the **ON** state, the **GEN** terminal connects to the internal **"Grid"** terminal of the inverter. In this case, the hybrid inverter will bypass the interactive inverter grid and EPS (Emergency Power Supply) system.

When the grid is disconnected, the **GEN** terminal connects to the inverter's internal **EPS** terminal. In this situation, the loads will be powered first by solar energy. If the solar power generated exceeds the load consumption, the excess energy will be stored in the battery.

When the solar power exceeds the sum of load power and the battery's maximum charging power (for example, when the battery is close to full), the inverter will signal the interactive inverter to reduce its power output using a **frequency shifting power reduction mechanism**. This helps maintain the balance between power generation and consumption within the microgrid system, ensuring that the system operates efficiently while preventing overproduction.

AC Coupling Settings for Existing Grid-Tied Systems

When an existing grid-tied system is connected to the **GEN** terminal, the **AC Coupling** function must be enabled. Here are the key settings and conditions to ensure proper operation:

1. State of Charge (SoC) for AC Coupling Inverter:

Start SoC (%): This is the initial State of Charge for the battery when the inverter starts operating in off-grid mode. It is recommended to set the start SoC between 50% to 70%.

End SoC (%): This is the battery charge level at which the AC coupling inverter will turn off in off-grid mode. The recommended value is 90%.

2. Grid-Tied Operation:

Grid and Grid Output Enabled:
When the grid and grid output are enabled, the AC coupling inverter will always be ON and will feed any excess power back to the grid.
Ensure that you have the proper permission from your utility provider to sell power back to the grid.

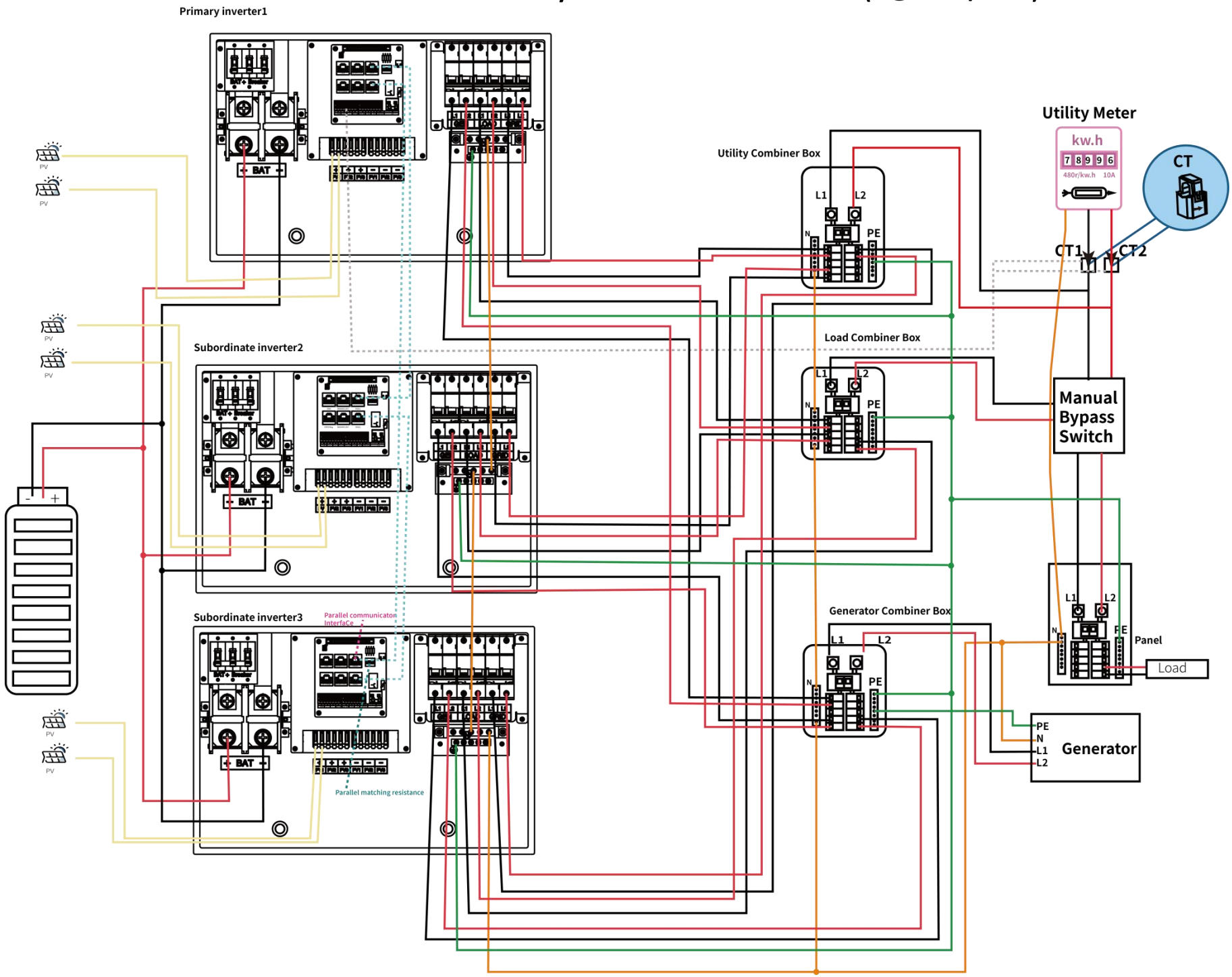
Grid Output Disabled:
If selling power back to the grid is prohibited, the AC coupling inverter will operate in shutdown mode and will not work in grid-tied mode to sell power.

6.9 System Parallel Operation

6.9.1 Parallel System Connection

The hybrid inverter supports **parallel operation**, allowing for scalable power and energy capacity to meet various usage scenarios. A total of up to **9 units** can be connected in parallel, achieving a capacity of up to **135kW**. The wiring diagram for parallel connection is provided below.

A.12KWx 3 Parallel system installation connection (3 @ 240V/120V)

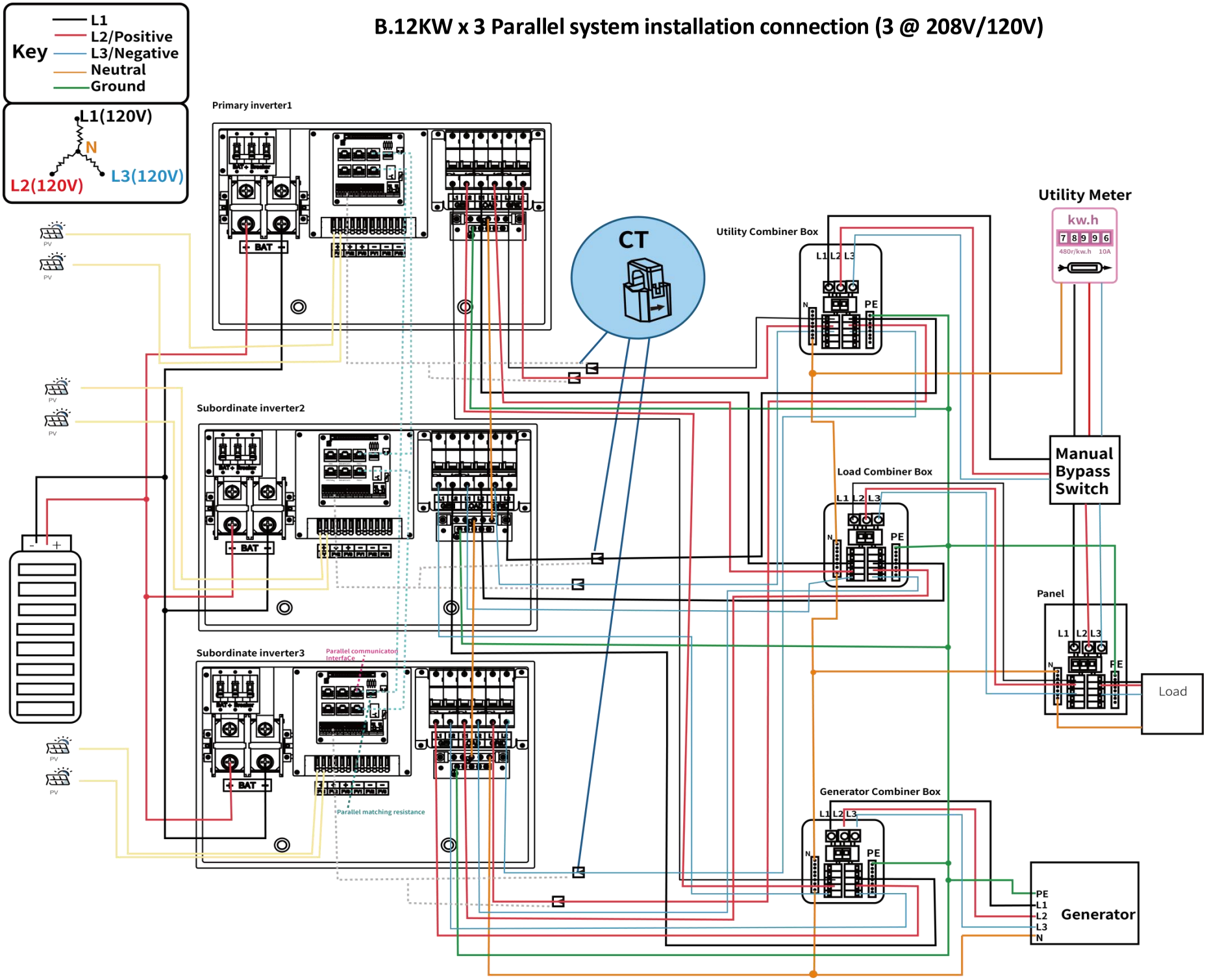


For the **daisy chain** circuit,ensure that the **2-position CAN termination resistors** on the **first** and **last** inverters in the chain are set to the **ON** position.

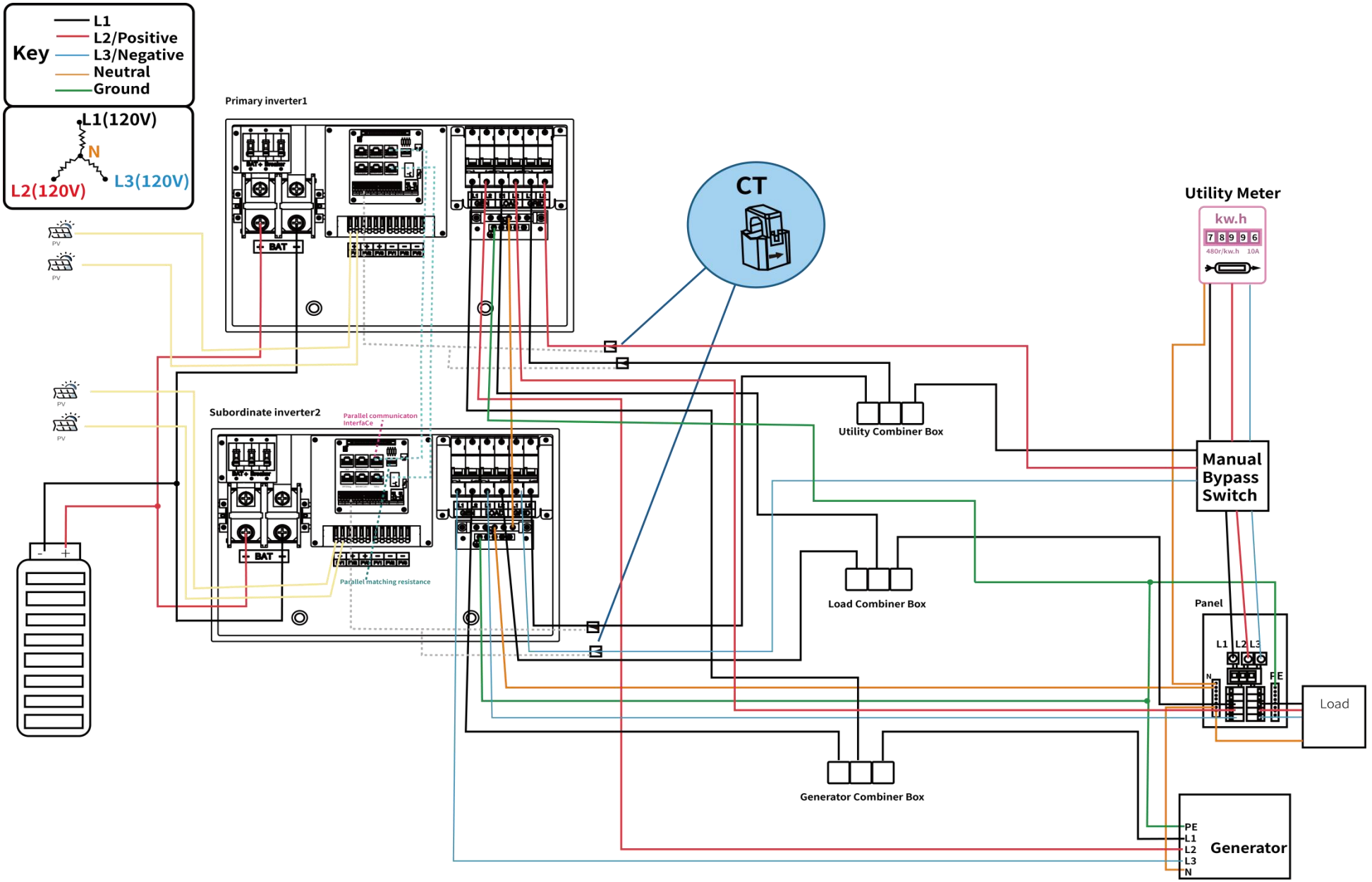
Steps:

1. **First Inverter**: Set the CAN termination resistor switch to **ON**.
2. **Last Inverter**: Set the CAN termination resistor switch to **ON** as well.
3. **Intermediate Inverters**: Leave the termination resistors in the **OFF** position for all inverters between the first and last units in the chain

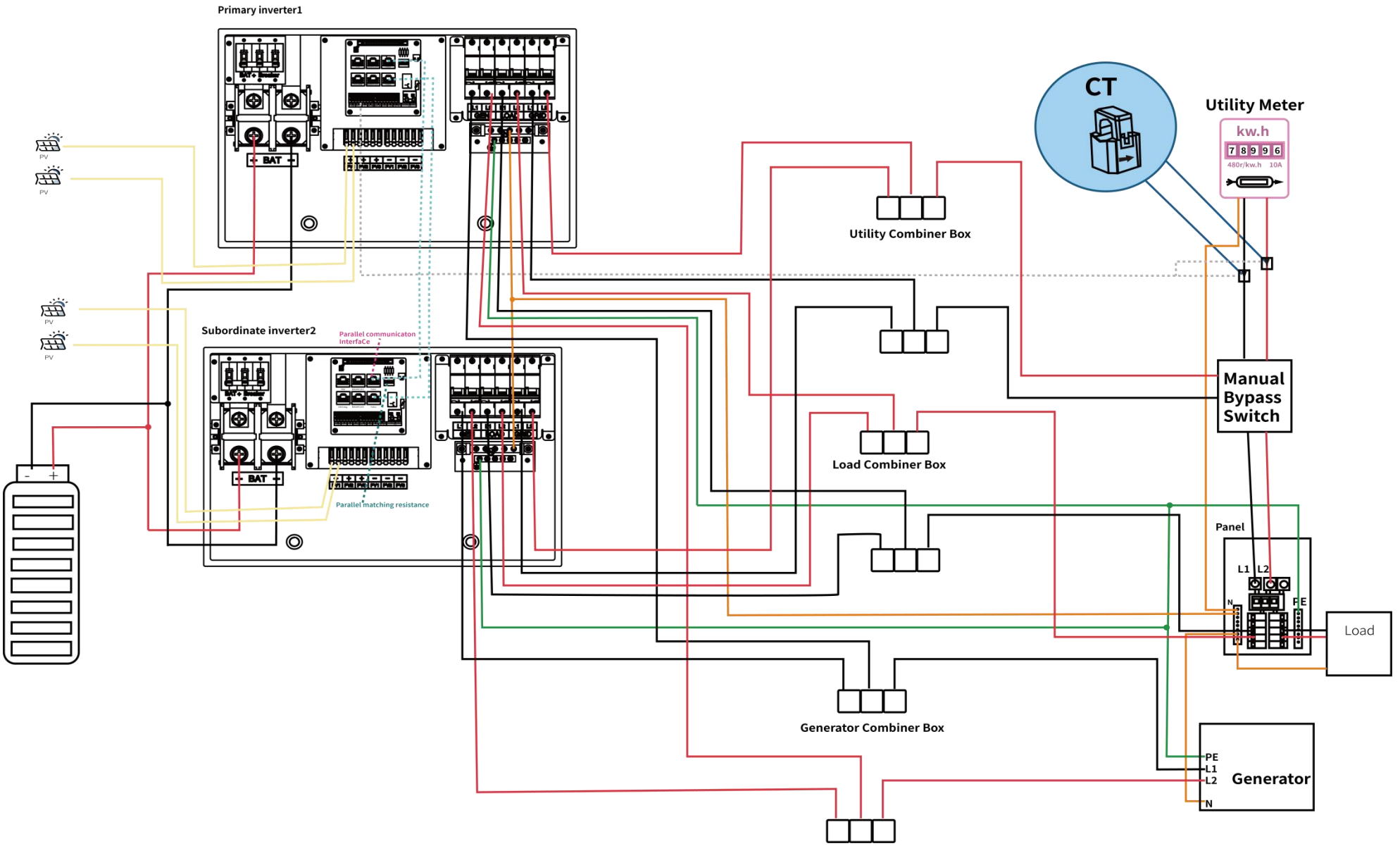
B.12KW x 3 Parallel system installation connection (3 @ 208V/120V)



C.12KW x 2 Parallel system installation connection (2 @ 208V/120V)



D,12KW x2 Parallel system installation connection (2 @ 240V/120V)



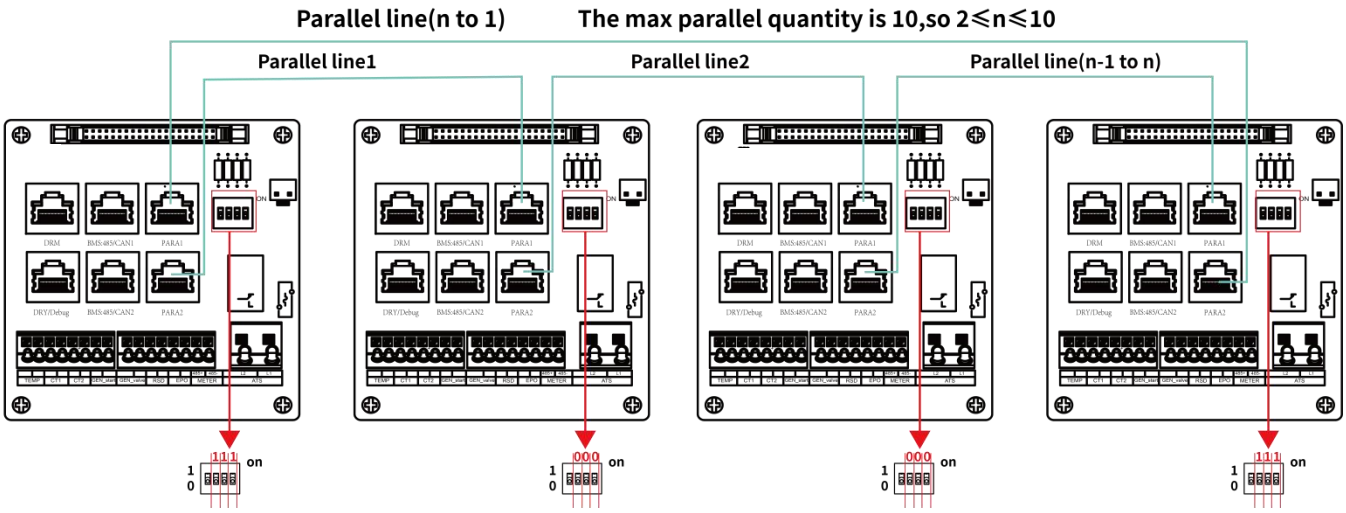
To properly configure the CAN communication for a daisy chain setup, follow these steps:

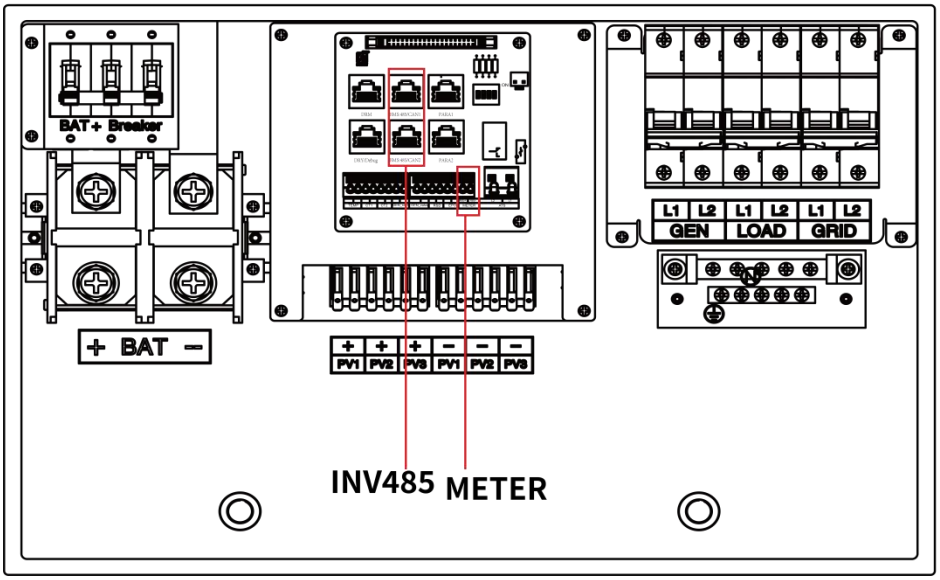
First Inverter:
Set the CAN communication pins to the ON position for the first inverter in the chain. This will enable communication and establish the starting point of the CAN bus.

Last Inverter:
Set the CAN communication pins to the ON position for the last inverter in the chain. This ensures the communication line is properly terminated at the end of the bus.

Intermediate Inverters:
For the inverters in between, the CAN communication pins should be left in the OFF position, as they act as repeaters but do not need to have the termination enabled.

If the **parallel cables** are not long enough or unavailable, you can create a **direct pin-to-pin cable** to extend the connections between the inverters.





7.Operation Guide

7.1 Operating Modes and Functions

This inverter offers different operating modes and functions to meet a variety of customer needs. The operating modes and their functions are as follows:

7.1.1 Self-Use Mode (Default)

In this mode, the priority order for powering the loads is: **Solar > Battery > Grid**.

For solar energy usage, the priority order is: **Load > Battery > Grid**.

Application Scenario

- **Self-Use Mode** helps maximize the self-consumption of solar energy, significantly reducing energy costs by minimizing reliance on the grid.

Related Settings

- The following settings are effective in **Self-Use Mode**:
  - **Disable Charging Priority**
  - **AC Charging**
  - **Forced Discharge**

7.2 Charging Priority Mode

In **Charging Priority Mode**, the solar energy usage priority order is:
Battery > Load > Grid.
During the **charging priority period**, the load is primarily powered by the grid. If there is excess solar power after charging the battery, the surplus energy will be used to supply the load, along with the grid power.

Application Scenario

- **Charging Priority Mode** is ideal when the user wants to charge the battery using solar energy while ensuring that grid power is used to supply the load.
- This mode ensures that the battery is charged first, using solar power, and only after the battery is fully charged will excess energy be used to supply the load or sent to the grid.

Key Benefit:

- This mode is particularly useful for optimizing battery storage while minimizing grid usage for powering the load, especially during periods of high solar generation.

7.3 AC Charging Mode

In **AC Charging Mode**, the user can charge the battery using grid power when electricity prices are low, and discharge the battery to power the load or feed power to the grid when electricity prices are high.

Application Scenario

- **AC Charging Mode** is especially useful for users on a **Time-of-Use (TOU) rate plan**, where electricity rates vary depending on the time of day.
- By using this mode, users can take advantage of cheaper off-peak electricity to charge the battery and then use the stored energy during peak hours when grid power is more expensive.

Related Settings:

- Users can configure charging schedules based on their local TOU pricing or utility tariffs to maximize cost savings.
- The inverter will automatically switch between charging and discharging modes based on the configured settings and current electricity rates.

This mode helps users manage energy costs effectively by optimizing battery use in alignment with variable electricity prices.

7.4 Grid Peak Shaving Function

Grid Peak Shaving and **Grid Peak Shaving Power (kW)** are settings used to limit the maximum power that the inverter can draw from the grid.

Function Description:

- **Grid Peak Shaving** allows the inverter to manage grid consumption by limiting the amount of power it draws from the grid during periods of high demand.
- **Grid Peak Shaving Power (kW)** setting determines the maximum amount of power (in kW) the inverter is allowed to import from the grid.

Application Scenario:

- This function is particularly useful when electricity rates are higher during peak periods. By setting a maximum power limit for grid import, the inverter can help reduce the overall grid consumption, thus avoiding high electricity costs.

How it Works:

- When the grid demand is high, and the inverter is configured with a peak shaving limit, it will automatically limit the amount of power drawn from the grid, prioritizing energy from the battery or solar power.
- This helps to smooth out the energy demand from the grid, especially in regions with time-of-use pricing or grid congestion.

7.5 Smart Load Function

The **Smart Load** function allows the power input connection point to act as a load connection point. When enabled, the inverter will supply power to the connected load when the **battery state of charge (SOC)** and **solar power (PV)** exceed the user-defined thresholds.

Function Description:

- **Smart Load Start SOC**: The battery's SOC threshold at which the Smart Load Port will be activated to supply power to the load.
- **Smart Load End SOC**: The SOC threshold below which the Smart Load Port will automatically turn off.
- **Start PV Power**: The minimum solar power output required to activate the Smart Load Port.

For example:

- **Smart Load Start SOC = 90%**
- **Smart Load End SOC = 85%**
- **Start PV Power = 300W**

Operation:

- When the **solar power** exceeds **300W** and the **battery SOC reaches 90%**, the Smart Load Port automatically turns on and supplies power to the connected load.
- When the **battery SOC falls below 85%** or the **solar power drops below 300W**, the Smart Load Port will automatically shut off.

Application Scenario:

- This function is useful when you want to prioritize powering non-critical loads with solar energy when both the battery is sufficiently charged and solar power generation is above a certain level, ensuring that only excess power is used for loads.

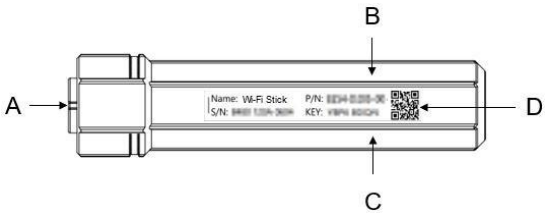
Important Note:

- **Do not connect a generator** when enabling the Smart Load function, as this can **damage the equipment**.

8.Wi-Fi&BLE stick installation

8.1 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.

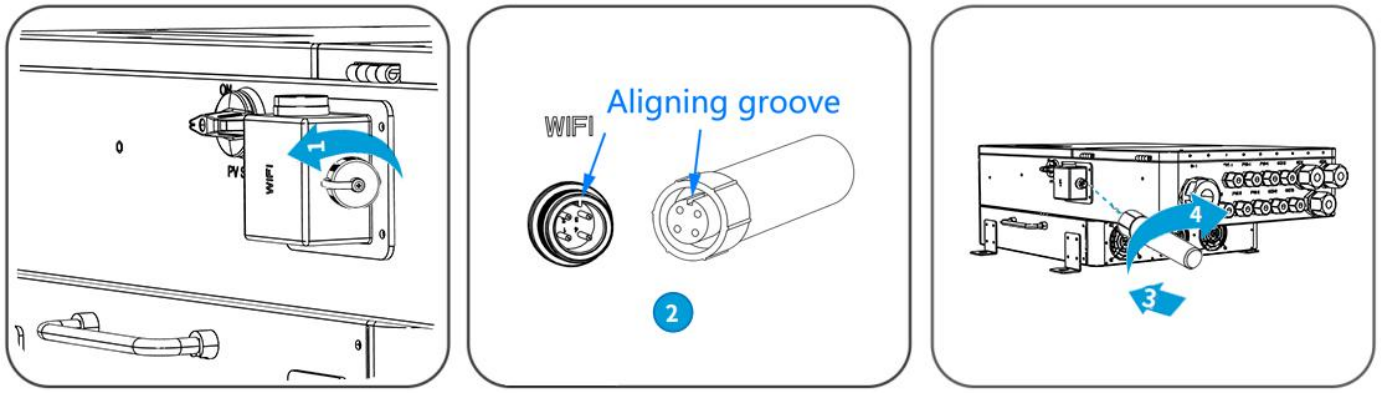
2.When the Wi-Fi&BLE stick is powered on, the green LED glows for 3S as a power on indication.

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

8.2 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.



8.3 Web/APP

Item	Web View	APP
QR Code		
Websit e	https://inteless.com/login	iOS: https://inteless.com/app/download Android: https://inteless.com/app/download

8.4 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

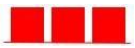
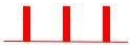
Wi-Fi Trouble Shooting

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?

8.5 Installation qualification

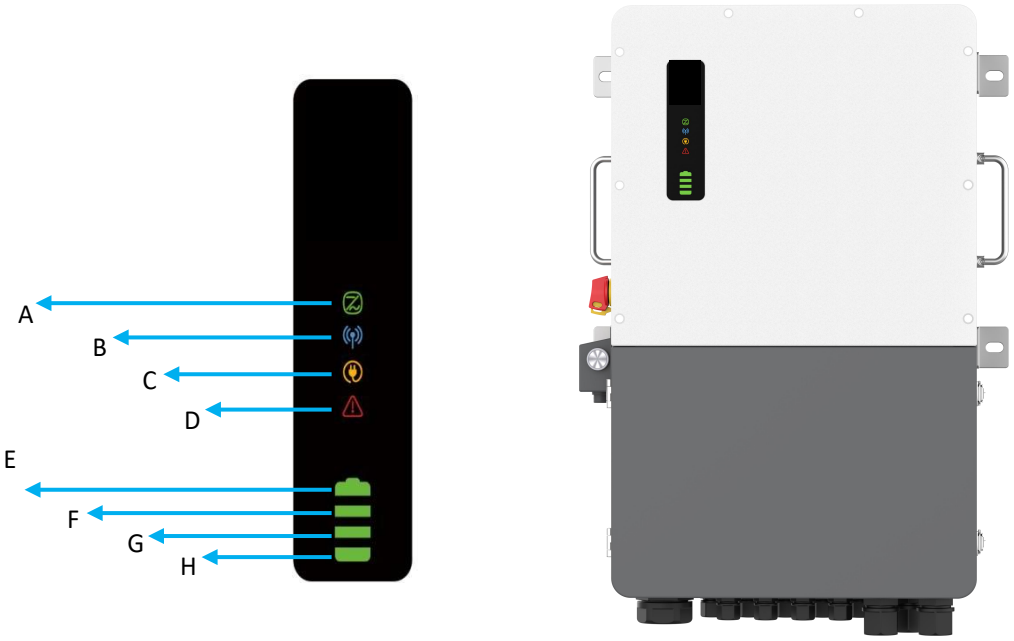
If the Wi-Fi&BLE stick works normally, red LED and green LED are always glowing. Otherwise, it needs to be corrected by referring to chapter 9 "LED indication and trouble shooting"

8.6 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

9.Operation

9.1 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	Green : ON , battery capacity is 90~100%.
	F	Green : ON , battery capacity is 61~89%.
	G	Green : ON , battery capacity is 35~60%.
	H	Green : ON , battery capacity is 10~34%.

10.Trouble Shooting

This section contains information and procedures for solving possible problems with the HL8-15K-P2SA series inverters, and provides you with trouble shooting tips to identify and solve most problems that could occur with the HL8-15K-P2SA 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 Description	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 large or the device derates, reduce the power consumption. Or seek help from us, if not go back to 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	
Relay self-test failure	
INV fault lock	
Busbar buffer failure	
INV phase lock fault	
Internal para matching fail	
aux power fault	
fan fault	
DC fault lock	
DC bus overvolt protection	
DC bus undervolt protection	
Leakage current overlimit 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 comm fault	
ARM-INV comm fault	
ARM-DCDC comm fault	
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-temp 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-temp fault	
INV overtemperature protection	
INV overtemperature 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 ch&disch prohabition	If the internal fault of the lithium battery occurs, Turn off the PV, grid, and

Bat genaral fault	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 over-volt fault	
Bat under-volt fault	
Bat high-temp protection	
Bat low-temp protection	
Bat disch 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 disch 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.

ls 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

of your system Descrioe detals installation and provide the model and serial number of the unit.

11.Maintenance

11.1 Power ON the Inverter for first time

DANGER

Important: Please follow these steps to turn on the inverter.

Step 1: make the PV SWITCH to the ON position.

Step 2: Turn on the battery. Turn on the DC switch between battery and inverter.

Step 3: Turn on the AC circuit breaker between the inverter port and the power grid.

Step 4: Open the AC circuit breaker between the inverter load port and the emergency load.

Step 5: Manually send the startup command through the APP (for safety, it can be set to automatic startup after the initial power-on).

Step 6: The inverter should start running now.

11.2 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.

11.3 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.

11.4 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.

12 Appendix

12.1 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