SEMOOKii

Residential Energy Storage System

Installation & Operation manual

Copyright Statement

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Version Information

Version	Date	Content
V01	12292022	New release

Contents

1. System Introduction

SEMOOKII HBC series residential energy storage system can provide clean solar energy for homes to reduce your electricity bill, improve your energy independence by uninterruptedly switching faulty grid to battery power supply. A small generator can be integrated to ensure system energy supply all the time.
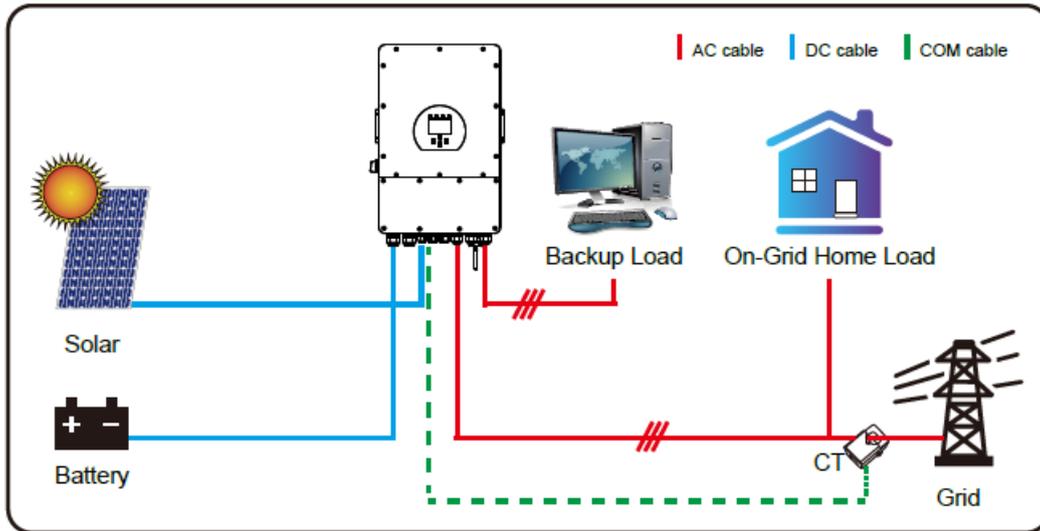
Mode I: Basic
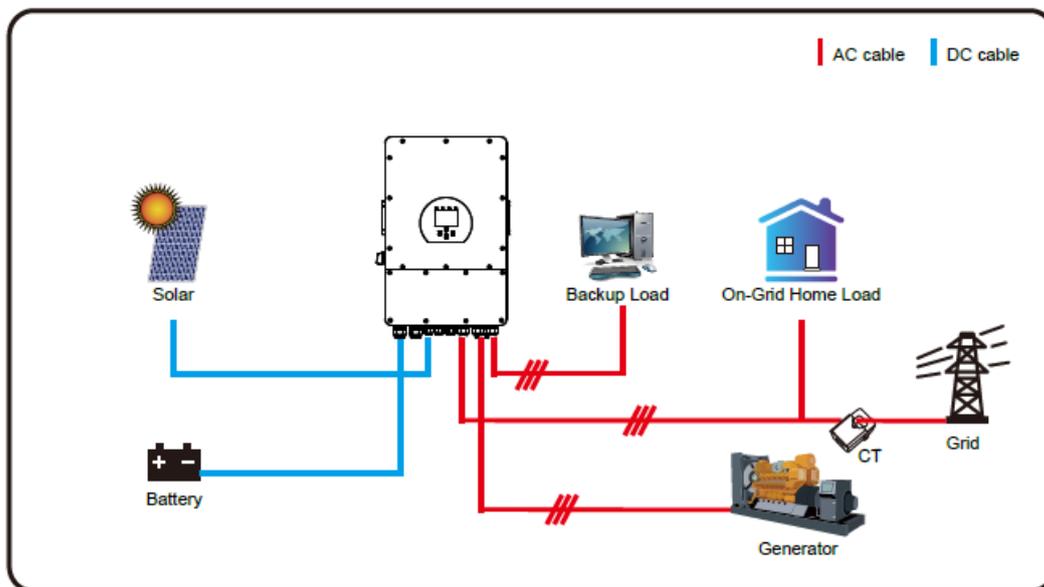
Mode II: With Generator
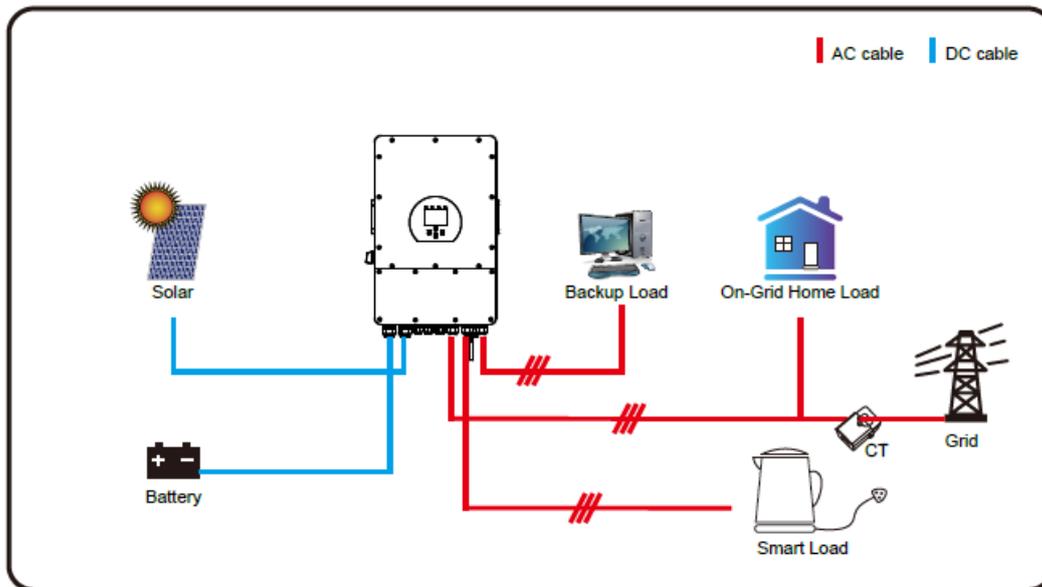
Mode III: With Smart-Load
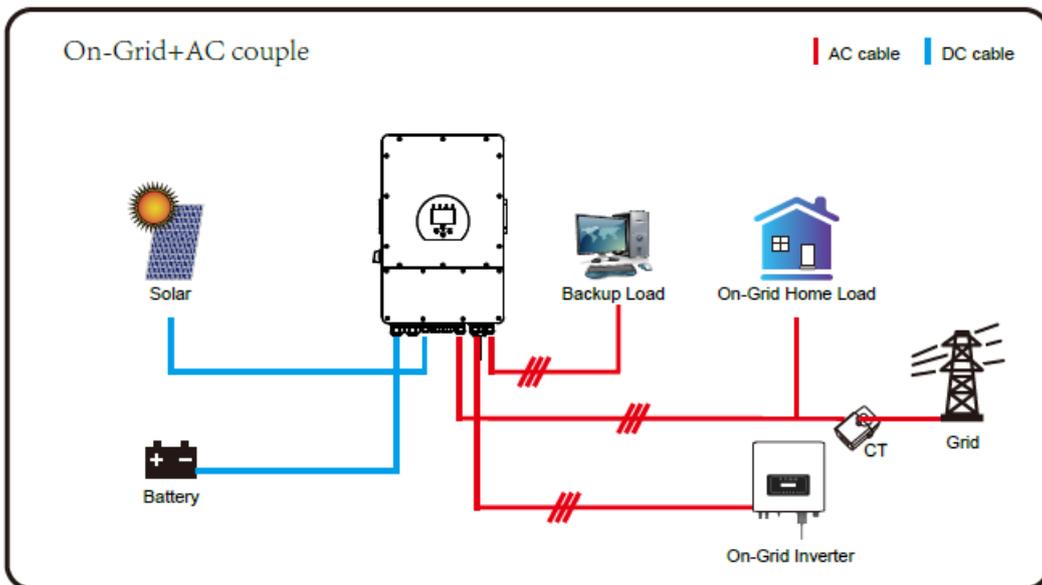
Mode IV: AC Couple

⚠	The 1st priority power of the system is always the PV power, then 2nd and 3rd priority power will be the battery bank or grid according to the settings. The last power backup will be the Generator if it is available.

1.1 General Precautions

⚠ DANGER

Danger to life due to high voltages of the PV array, battery and electric shock.

When exposed to sunlight, the PV array generates dangerous DC voltage which will be present in the DC conductors and the live components of the inverter. Touching the DC conductors or the live components can lead to lethal electric shocks. If you disconnect the DC connectors from the system under load, an electric arc may occur leading to electric shock and burns.

- ➢ Do not touch uninsulated cable ends.
- ➢ Do not touch the DC conductors.
- ➢ Do not open the inverter and battery.
- ➢ Do not wipe the system with damp cloth.
- ➢ Have the system installed and commissioned by qualified people with appropriate skills only.
- ➢ Prior to performing any work on the inverter or the battery pack, disconnect the inverter from all voltage sources as described in this document.

⚠ WARNING

Risk of chemical burns from electrolyte or toxic gases.

During standard operation, no electrolyte shall leak from the battery pack and no toxic gases shall form. Even with careful manufacturing process, if the battery pack is damaged or a fault occurs, it is possible that electrolyte may be leaked or toxic gases formed.

- ➢ Do not install the system in any environment of temperature below -10°C or over 50°C and in which humidity is over 85%.
- ➢ Do not touch the system with wet hands.
- ➢ Do not put any heavy objects on top of the system.
- ➢ Do not damage the system with sharp objects.
- ➢ Do not install or operate the system in potentially explosive atmospheres or areas of high humidity.
- ➢ Do not mount the inverter and the battery pack in areas containing highly flammable materials or gases.
- ➢ If moisture has penetrated the system (e.g. due to a damaged enclosure), do not install or operate the system.
- ➢ Do not move the system when it is already connected with battery modules.
- ➢ Secure the system to prevent tipping with restraining straps in your vehicle.
- ➢ The transportation of the HBC Series productions must be made by the manufacturer or a qualified person. These instructions shall be recorded and repeated.
- ➢ A certified ABC fire extinguisher with minimum capacity of 2kg must be carried along when transporting.
- ➢ It is totally prohibited to smoke in the vehicle as well as close to the vehicle when loading and unloading.
- ➢ For the exchange of a battery module, please request for new hazardous goods packaging if needed, pack it and let it be picked up by the suppliers.
- ➢ In case of contact with electrolyte, rinse the affected areas immediately with water and consult a doctor without delay.

⚠ CAUTION

Risk of injury through lifting or dropping the system.

The inverter and battery are heavy. There is risk of injury if the inverter or battery is lifted incorrectly or dropped during transport or when attaching to or removing from the wall.

- ➢ Lifting and transporting the inverter and battery must be carried out by more than 1 person.

1.2 Parts List

Check the following parts list to ensure it is complete.
HBC Series productions delivers a total system separately on site to client, this consists of:

1.2.1 Battery

Item	Photo	Description	Quantity
1		Battery pack	1
2		wall mounting bracket	1
3		wall hanging bracket	2
4		expansion bolts	4
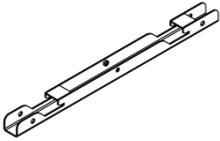
1.2.2 Inverter

Single Phase Inverter
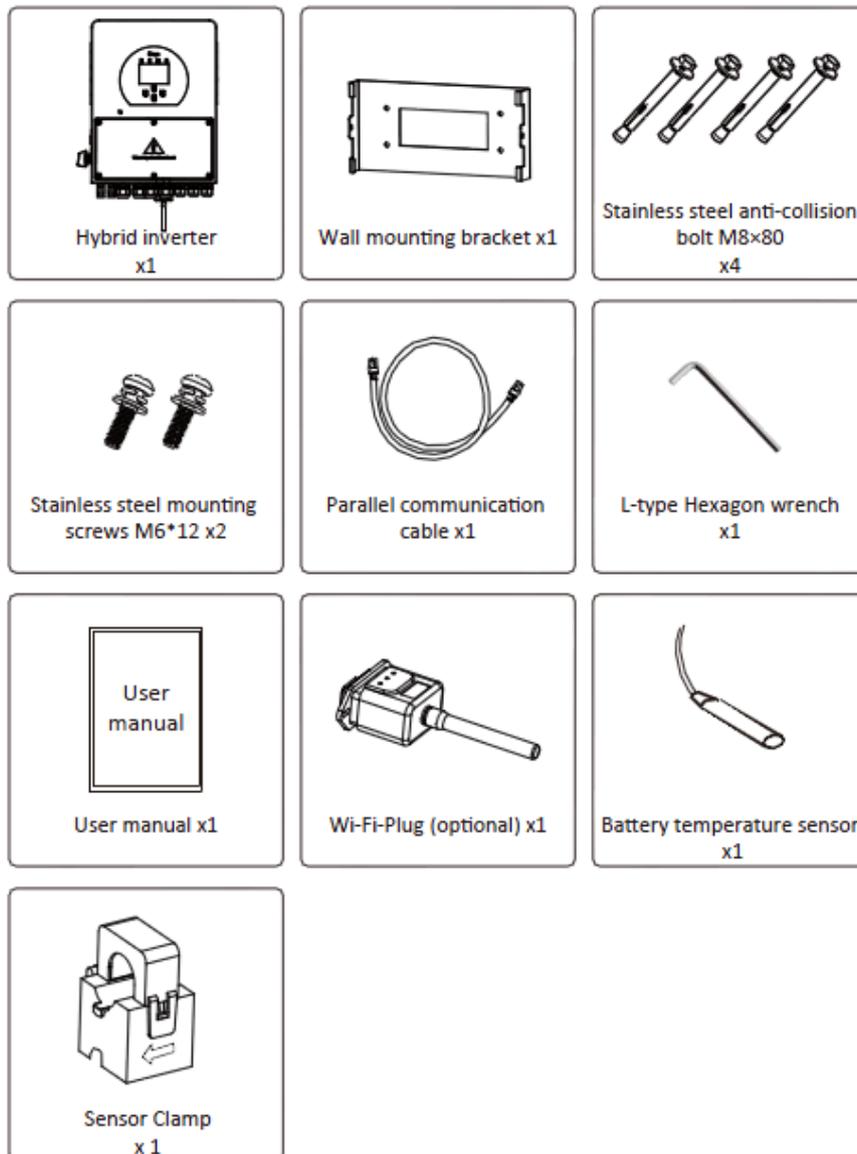
1.2.3 Backup Box
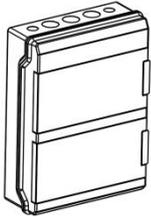
AC Backup box		With breakers, Current transformer ,Plastic expansion screws etc.

1.2.4 DC Box
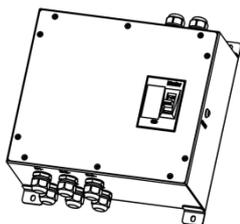
DC box		With breaker, Plastic expansion screws
Power cables		Positive power cable (x3) Negative power cable (x3)
Communication cable		Communication cable (x3)
screws		M6 (x6)
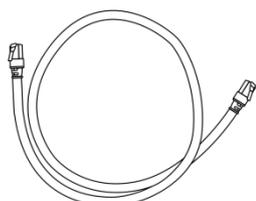
1.3 System Diagram
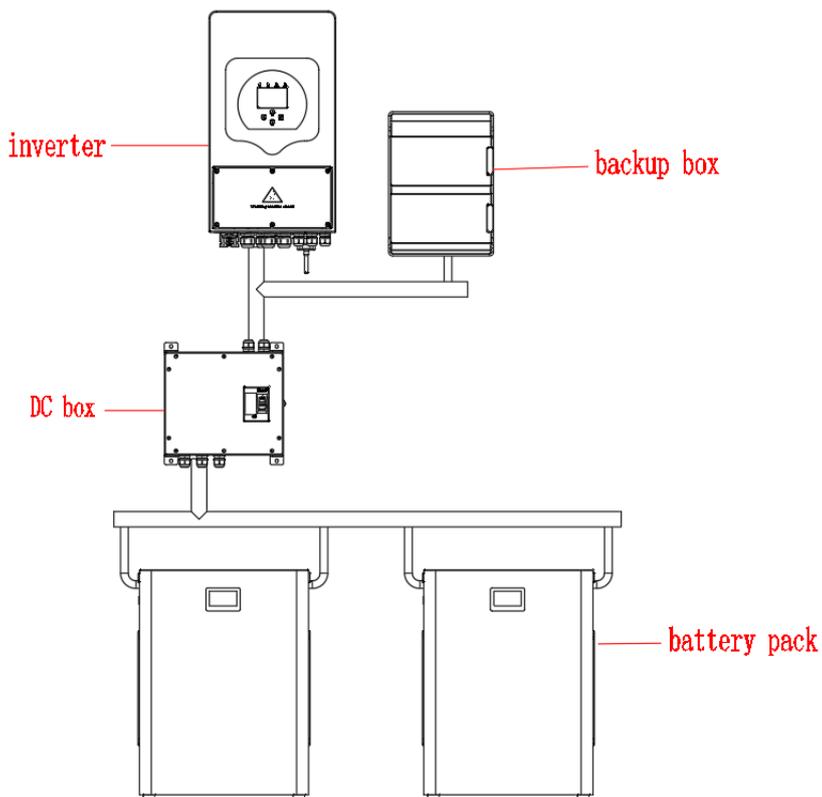
Item	Description	Model
1	Inverter	MIV-5S
2	Backup box	BB-01
3	DC box	HB-0352
4	Battery pack	MF51100C

1.4 Description

1.4.1 Battery
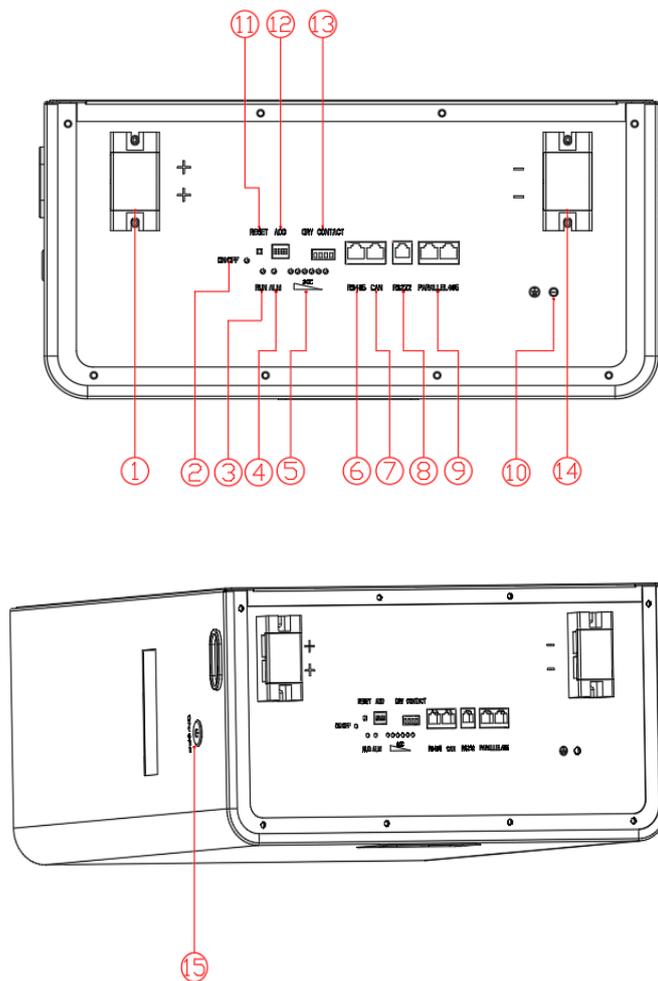
1: Positive terminal	9: Parallel communication ports
2: Power indicator	10: Ground
3: Run indicator	11: Reset button
4: Alarm	12: DIP switch
5: SOC indicators	13: Dry contact
6: RS485 port	14: Negative terminal
7: CAN port	15: ON/OFF switch
8: RS232 port	

1.4.2 Inverter
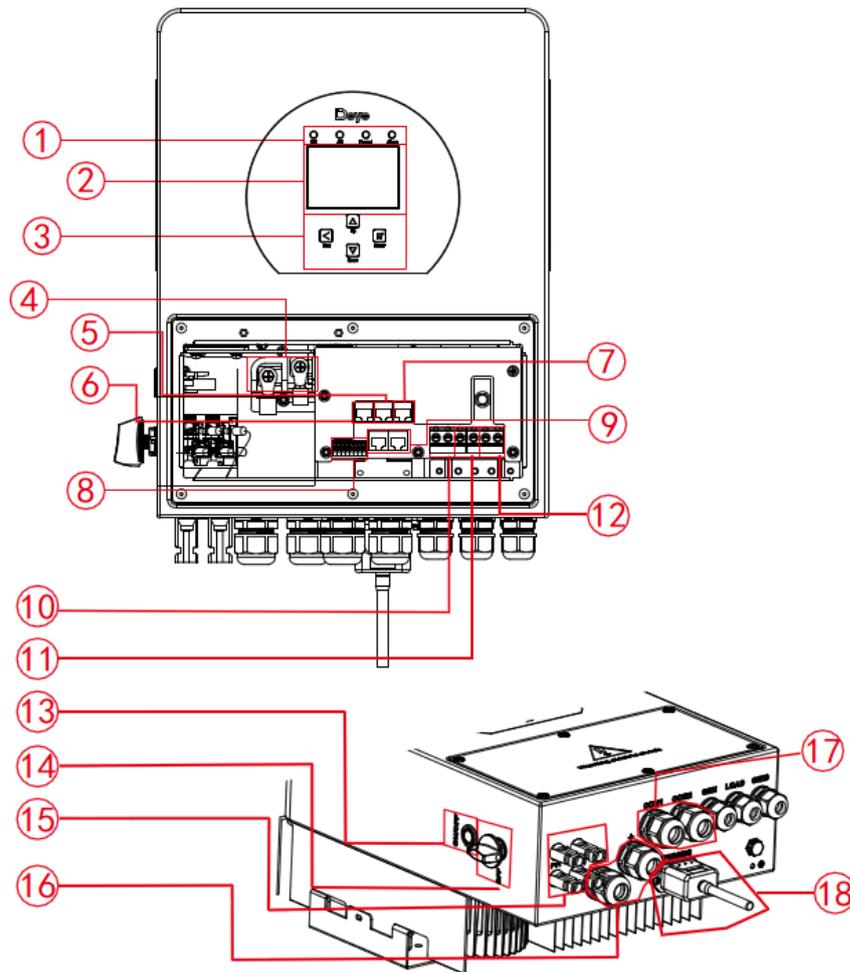
1: Inverter indicators	7: Meter port	13: Power on/off button
2: LCD display	8: Function Port	14: DC Switch
3: Function buttons	9: Parallel port	15: PV input with two MPPT
4: Battery input connectors	10: Generator input	16: Battery
5: RS 485 Port	11: Load (Backup load)	17: Temperature sensor
6: BMS CAN Port	12: Grid	18: WiFi Interface

Inverter Size

Mounting bracket
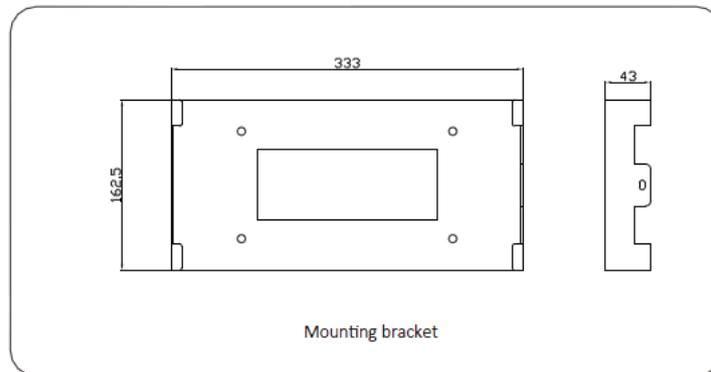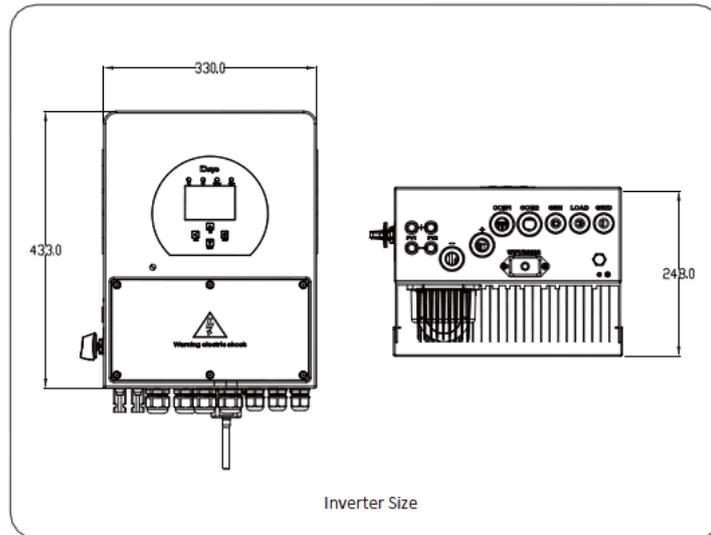
1.4.3 Backup box

QF1: Grid input breaker

QF2: Home load breaker

QF3: Backup load breaker

QF4: GEN breaker

1.4.4 DC box
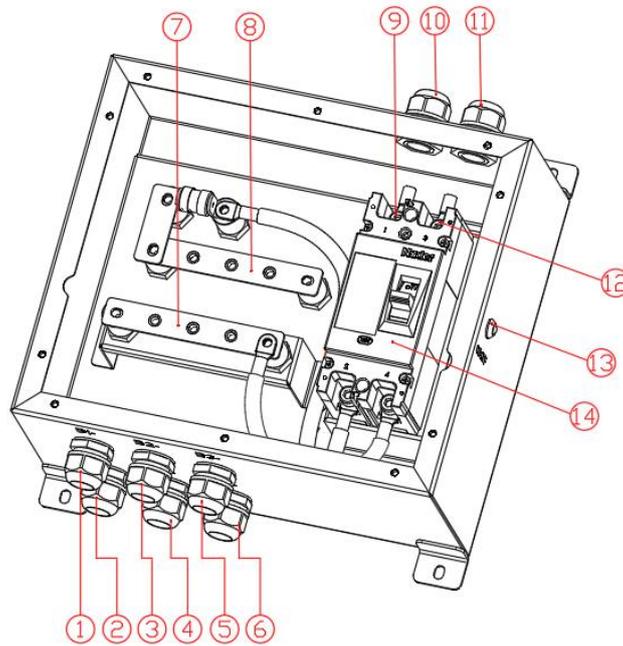
1: Battery port 1-	8: Parallel copper bar +
2: Battery port 1+	9: Battery +
3: Battery port 2-	10: Battery port+
4: Battery port 2+	11: Battery port-
5: Battery port 3-	12: Battery -
6: Battery port 3+	13: Power indicator
7: Parallel copper bar -	14: Breaker

1.5 Liability Limitation

Any product damage or property loss caused by the following conditions manufacturer does not assume any direct or indirect liability.

• System design and installation are not in compliance with standards and regulations;
• Failure to comply with the local safety regulations (VDE for DE, SAA for AU);
• Transport damage (including painting scratch caused by rubbing inside of packaging during shipping). A claim should be made directly to shipping or insurance company in this case as soon as the container/packaging is unloaded and such damage is identified;
• Failure to follow any/all of the user manual, the installation guide and the maintenance regulations;
• Improper use or misuse of the device;
• Insufficient ventilation of the device;
• The maintenance procedures relating to the product have not been followed to an acceptable standard;
• Force majeure (violent or stormy weather, lightning, overvoltage, fire etc.);
• Damages caused by any external factors.

2. Installation Site and Environment

2.1 General

The system is installed in a room, the location is not obstructed by the structure of the building, fixtures and fittings within the room. The system adopts natural ventilation. The location should be clean, dry and adequately ventilated. The room's entry doors and panels shall open in the direction of egress and allow unobstructed access to the HBC for installation and maintenance purposes.
The following location are not allowed for installation:
• Habitable rooms;
• In ceiling spaces;
• Wall cavities;
• On roofs not specifically deemed suitable;
• Areas of access/egress;
• Under stairways;
• Under access walkways;
• Sites where the freezing point is reached, like garages, carports or other places;
• Sites with humidity and condensation over 85%;
• Sites which are salty and where humid air can penetrate;
• Earthquake areas –additional security measures are required here;
• Sites that are higher than 3000 meters above the sea level;
• Sites with explosive atmosphere;
• Sites with direct sunlight;
• Sites with extreme change of ambient temperature;
• Wet rooms;
• Sites with highly flammable materials or gases;
• Sites with a potentially explosive atmosphere.

2.2   Restricted Locations

2.2.1 Inverter

The inverters are designed for indoor and outdoor installation (IP65), to increase the safety, performance and lifespan of the inverter, please select the mounting location carefully based on the following rules:
• The inverter should be installed on a solid surface, far from flammable or corrosion materials, where is suitable for inverter's weight and dimensions.
• The ambient temperature should be within -25℃ ~ 60℃ (between -13 °F and 140°F).
• The installation of inverter should be protected under shelter. Do not expose the inverter to direct sunlight, water, rain, snow, spray lightning, etc.
• The inverter should be installed vertically on the wall, or lean back on plane with a limited tilted angle. Please refer to below picture.
• Leave the enough space around inverter, easy for accessing to the inverter, wiring and maintenance.
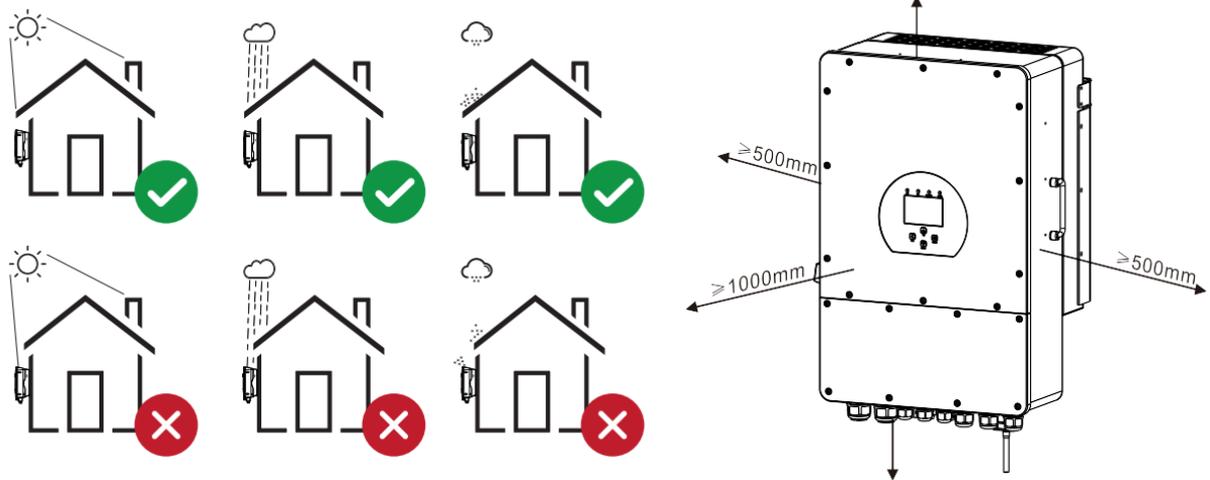
For proper air circulation to dissipate heat, allow a clearance of approx. 50cm to the side and approx. 50cm above and below the unit. And 100cm to the front.

2.2.2 Battery

The batteries are designed for indoor installation (IP20), to increase the safety, performance and lifespan of the battery, please select the mounting location carefully based on the following rules:

• The battery should be installed on a solid surface, far from flammable or corrosion materials, where is suitable for battery's weight and dimensions.

• The ambient temperature should be within -25℃ ~ 60℃ (between -13 °F and 140°F).

• The installation of battery should be protected under shelter. Do not expose the battery to direct sunlight, water, rain, snow, spray lightning, etc.

• The battery should be installed vertically on the wall.

• Leave the enough space around battery, easy for accessing to the battery, wiring and maintenance.

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2.3 Installation

2.3.1 Installation of batteries
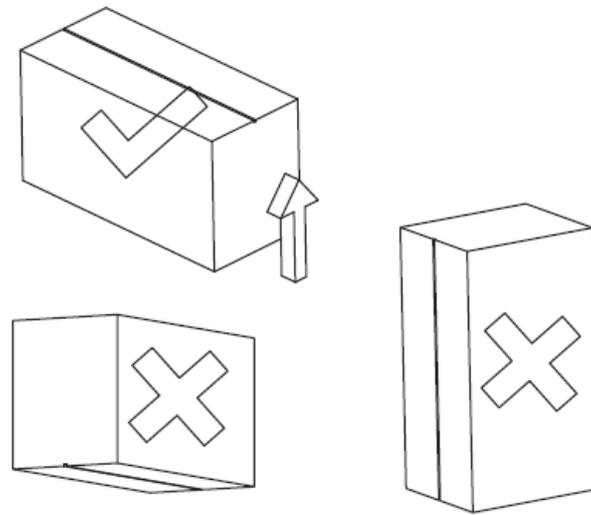
Unpacking the Battery

Take the battery out of the packaging box.
Note: the packaging box must be placed in accordance with the marking direction, the upward carton, the other direction of the unpacking is wrong.

Step 1：Separate the wall mounting bracket from the battery pack, place the wall mounting bracket in a proper position and close to the wall, mark the punching position with a marker, remove the wall mounting bracket and Drill φ10 holes on the wall , 80mm deep and fix the wall mounting bracket on the wall with expansion bolts.
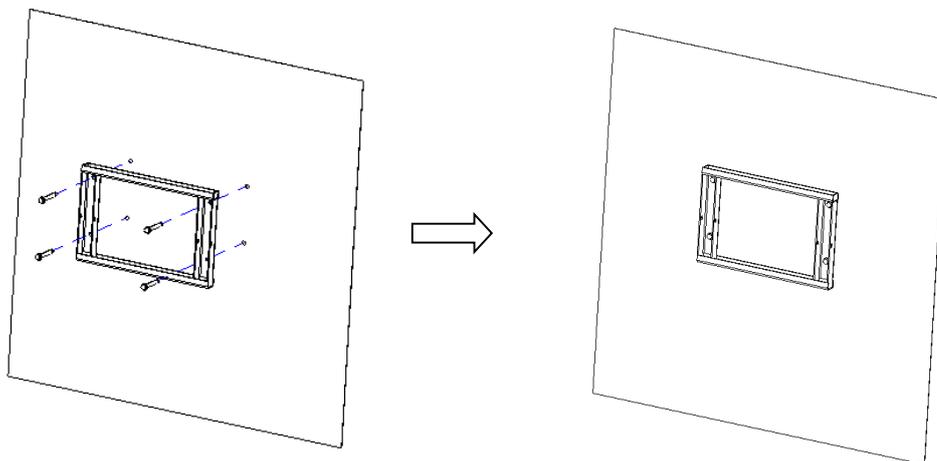
Step 2: Hang the battery pack on the wall mounting bracket and fix it with M5*16 screws on both sides.
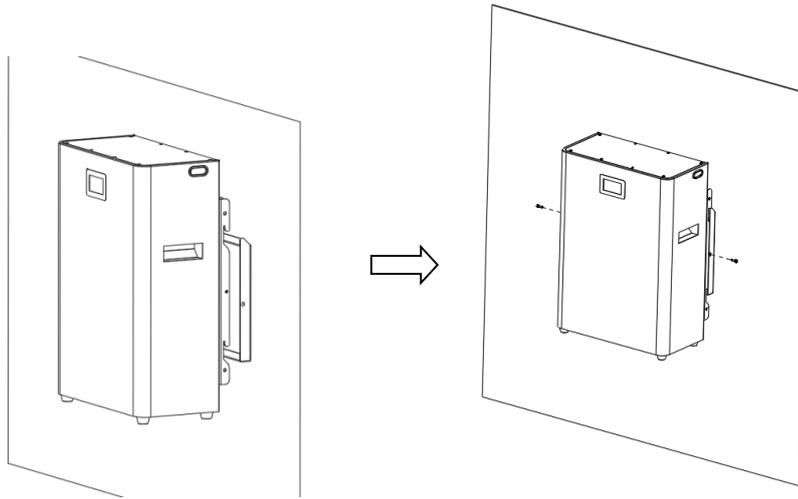
Step 3: If multiple battery packs are used, Repeat Step 1 and 2. The distance between battery packs must be at least 300mm.
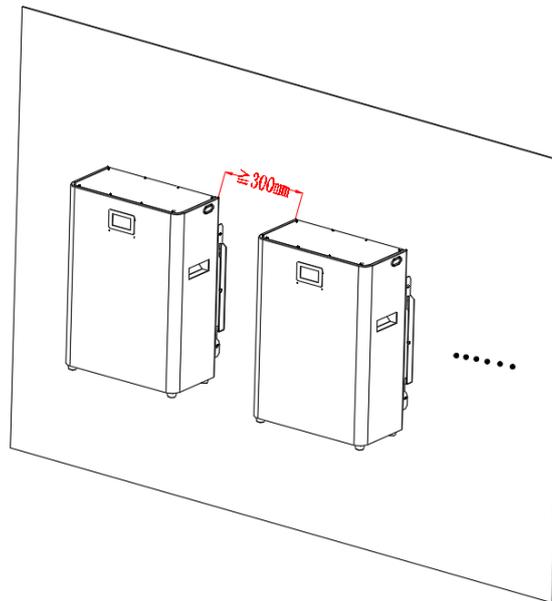
2.3.2 Installation of inverter

Remember that this inverter is heavy! Please be careful when lifting out from the package. Drill φ10 holes on the wall, 60mm deep.

1. Use a proper hammer to fit the expansion bolt into the holes.
2. Carry the inverter and holding it, make sure the hanger aim at the expansion bolt, and fix the inverter on the wall.
3. Fasten the screw head of the expansion bolt to finish the mounting.
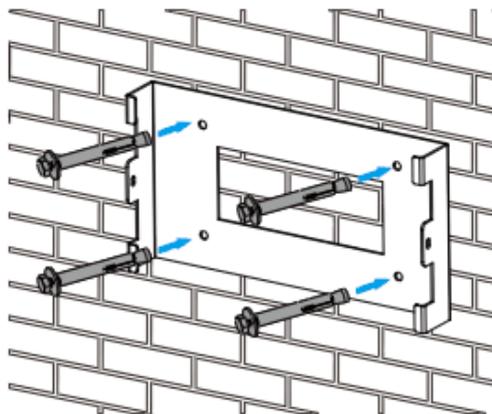
Inverter hanging plate installation
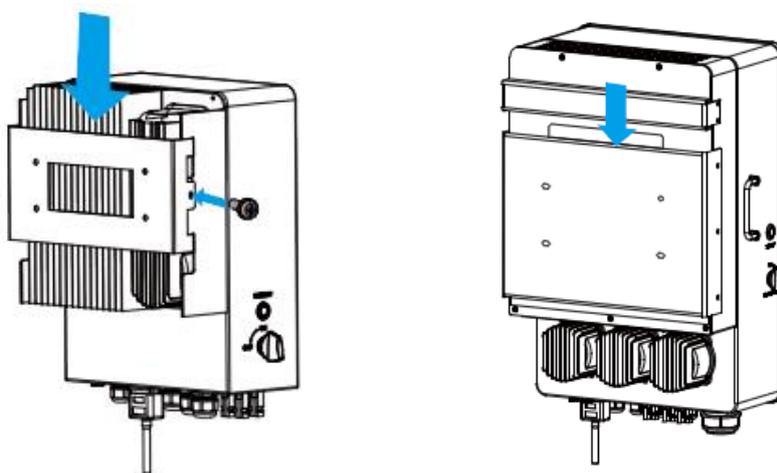
2.3.3 Installation of DC box

Place the DC box in a proper position and close to the wall, mark the punching position with a marker, remove the DC box and Drill φ6 holes on the wall , 60mm deep and fix the DC box on the wall with Plastic expansion screws.
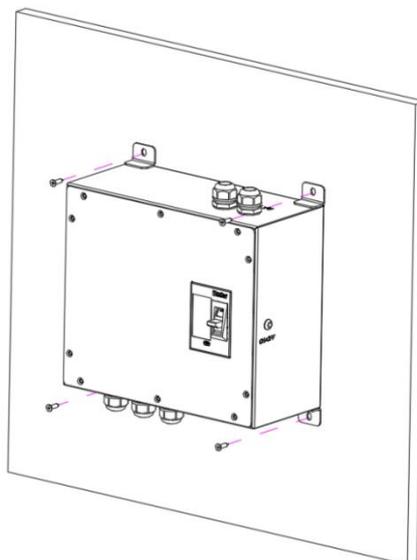
2.4 Wiring

2.4.1 Lithium Battery Connection

Step 1: Make sure the circuit breaker of DC backup box is open. Connect the positive and negative cables between the battery and the DC backup box respectively, and connect the other positive and negative cables between to DC backup box and inverter respectively. When multiple batteries are used and need to be connected in parallel, see below:
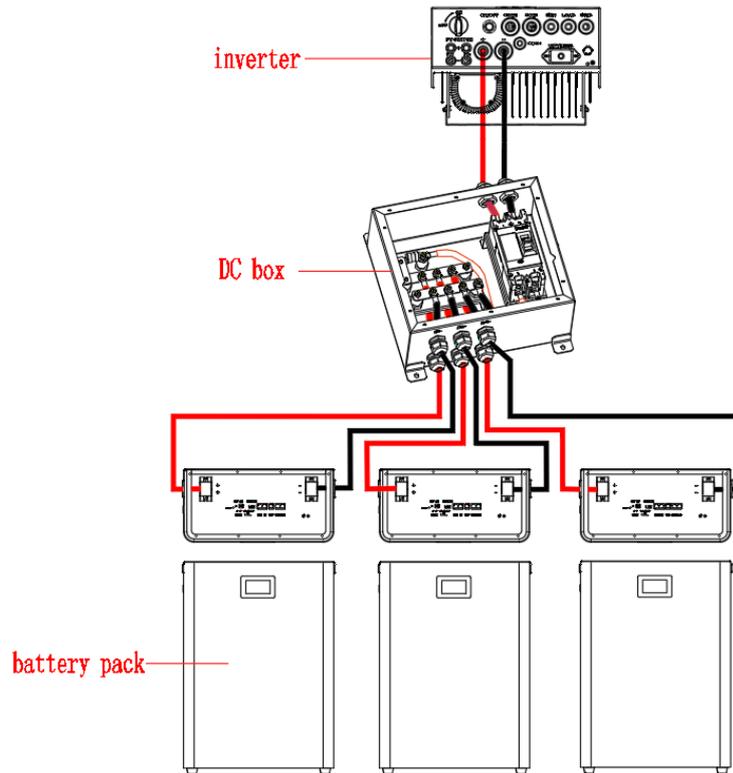
The cable specifications for the DC side of the inverter are as follows：

Model	Wire Size	Cable(mm²)	Torque value(max)
3Kw	4AWG	25	5.2Nm
3.6/5/6Kw	2AWG	35	5.2Nm

Single phase inverter

Model	Wire Size	Cable(mm²)	Torque value(max)
5Kw	2AWG	35	24.5Nm
6Kw	1AWG	40	24.5Nm
8Kw	1AWG	40	24.5Nm
10Kw	1/0AWG	60	24.5Nm
12Kw	1/0AWG	60	24.5Nm

Three phase inverter

Note:
1. Turn off the battery and inverter and open the related breakers before connecting the cables;
2. Due to the different battery capacities and the number of batteries connected in parallel, the specifications and lengths of the connecting cables are also different.

Step 2: Connect the communication cable between the inverter and the lithium battery.
The communication cable uses RJ45 cable. Connect it between the CAN communication port of the lithium battery and the BMS CAN communication port of the inverter.
Note:
1. The communication cable can go directly through waterproof sealing ring and no need to make net cable on the spot.
2. To remove the waterproof connector, it shall be rotated counterclockwise according to the installation procedure.
3. Use a screwdriver to remove the maintenance baffle before wiring.
4. Please be careful. Do not short the positive and negative terminals during installation.
5. The waterproof sealing ring needs to be confirmed that it shall be inserted into the plastic claw ring during installation.
6. When connecting the DC box cable, the positive lug of the indicator light and the BAT+ lug are bolted together.

⚠️**DANGER**

Make sure all the circuit breakers are open.

Step 3: Connect the load side of circuit breakers in AC backup box to the inverter with proper cables, including grid, load and generator (if there is), according to below electrical diagram.
Step 4:Connect the grid, load, and generator to the AC backup box terminals with appropriate cables.

Single Phase Inverter	
Backup box	

Backup box wiring table:

AC Input Grid	Grid L	GL	1	QF1:1
	Grid N	GN	2	QF1:3
AC Output Inverter	IGrid L	IL	3	XT:12
	IGrid N	IN	4	XT:16
Backup Input Inverter	IBLoad L	IBL	5	QF3:1
	IBLoad N	IBN	6	QF3:3
AC Output Home Load	HLoad L	HL	7	QF2:2
	HLoad N	HN	8	QF2:4
AC Output Backup Load	BLoad L	BL	9	QF3:2
	BLoad N	BN	10	QF3:4
		GL	11	QF1:2
			12	XT:3
			13	QF2:1
		GN	14	QF2:3
			15	QF1:4
			16	XT:4
AC Input Generator	GEN L	GEN L	17	QF4:1
	GEN N	GEN N	18	QF4:3
AC Output Inverter	GEN L	GEN L	19	QF2:2
	GEN N	GEN N	20	QF4:4

Function Definition of Circuit breaker

QF1# Grid Input
QF2# Home Load
QF3# Backup Load
QF4# GEN

XT

AC Input Grid	Grid L	GL	1	QF1:1
	Grid N	GN	2	QF1:3
AC Output Inverter	IGrid L	IL	3	XT:12
	IGrid N	IN	4	XT:16
Backup Input Inverter	IBLoad L	IBL	5	QF3:1
	IBLoad N	IBN	6	QF3:3
AC Output Home Load	HLoad L	HL	7	QF2:2
	HLoad N	HN	8	QF2:4
AC Output Backup Load	BLoad L	BL	9	QF3:2
	BLoad N	BN	10	QF3:4
		GL	11	QF1:2
			12	XT:3
			13	QF2:1
		GN	14	QF2:3
			15	QF1:4
			16	XT:4
AC Input Generator	GEN L	GEN L	17	QF4:1
	GEN N	GEN N	18	QF4:3
AC Output Inverter	GEN L	GEN L	19	QF2:2
	GEN N	GEN N	20	QF4:4

CT
S1 S2
Yellow wire① Black wire②

QF1
QF3
QF2
QF4

PE_Bar
Grid_PE
IGrid_PE
GEN_PE

HBC-**-**
BB端子排接线图

比例 1:1

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SEMOOKII BESS CO., LTD.
www.rpnc-group.com

SEMOOKii

CAN
RS485
RS485
RS485

Battery PACKW
DC51.2V100Ah
4.3KWah, 16PCES

Battery PACKW
DC51.2V100Ah
4.3KWah, 16PCES

Battery PACKW
DC51.2V100Ah
4.3KWah, 16PCES

PVI
PVI
PVN
PVN
PV1#+
PV1#−
PV2#+
PV2#−

SPD
SPD

PV

B+ B−
B+ B−
B+ B−

CAN

RVB_4㎜² (R) ∗1
RVB_4㎜² (B) ∗1
RVB_4㎜² (R) ∗1
RVB_4㎜² (B) ∗1

RVB_1.0.25㎜² (B+G) ∗2
RVB_0.35㎜² (B) ∗1
RVB_0.35㎜² (R) ∗1

Battery
BAT CANL
BAT CANH
B−
B+
QF5

Single-phase Hybrid Inverter

DC input
PV Input
PV input
Battery

− +
− +
PV

Generate
PE N L
QF4

AC

Function Port
CBU(3 White)
CBU(4 Black)
AC
N
L
Load
L
N

PE

Home Load
L N PE
QF2
RVB_6㎜² (B) ∗1
RVB_6㎜² (B) ∗1

PE_Bar

CT
S1
S2

RVB_6㎜² (B) ∗1
RVB_6㎜² (B) ∗1
RVB_6㎜² (B) ∗1

QF1
QF3
RVB_6㎜² (B) ∗1

Grid
PE N L

Load
PE N L

RVB_6㎜² (G+Y) ∗1
RVB_6㎜² (G+Y) ∗1

项目性名
日期
设计
工艺
项目性名
日期
校对
标准化
比例 1:1
审核
批准
图号
页数 第 4 页 共 11 页

型号 HBC-***-**
品名 HBC系统原理图

2.4.2 PV Connection

After crimping the PV cable to the PV terminal, connect it directly to the inverter.
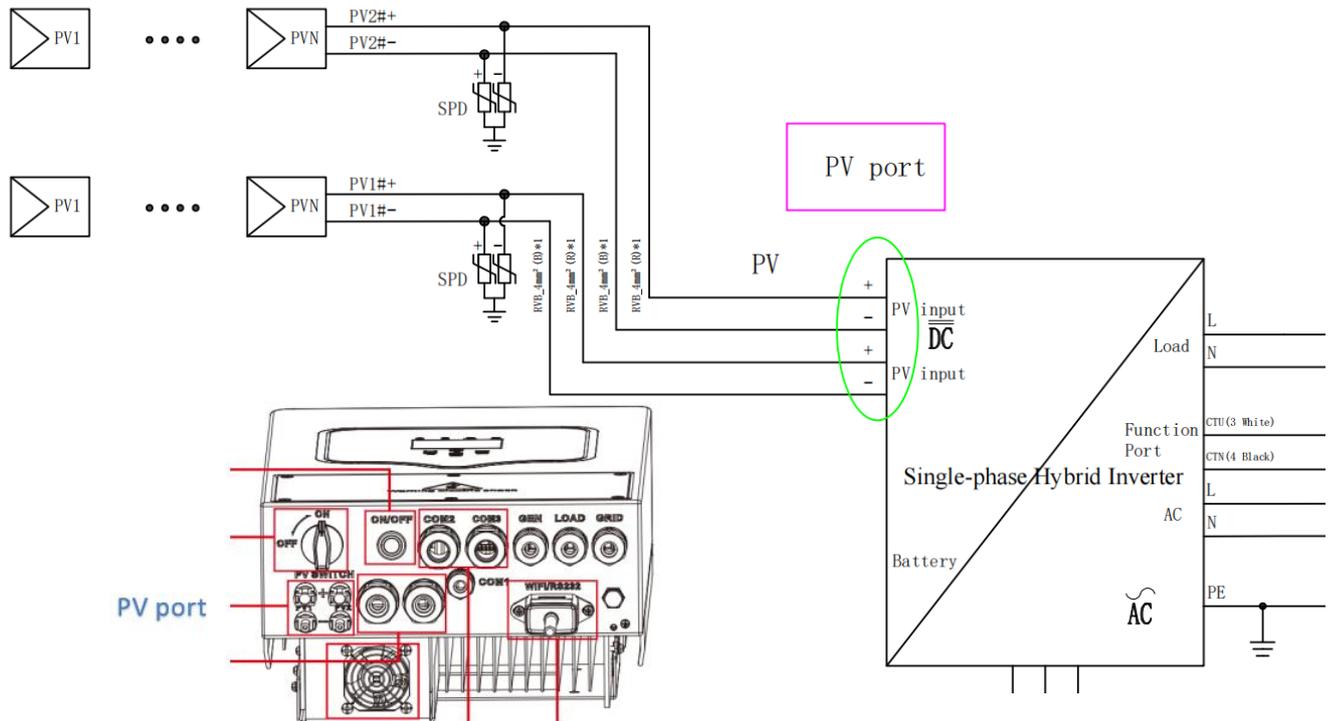
⚠️WARING

➢ To avoid any malfunction, do not connect any PV modules with possible current leakage to the inverter. For example, grounded PV modules will cause current leakage to the inverter. When using PV modules, please be sure NO grounding.

➢ It is requested to use PV junction box with surge protection. Otherwise, it will cause damage on inverter when lightning occurs on PV modules.

2.4.2.1 PV Module Selection

When selecting proper PV modules, please be sure to consider below parameters:
1) Open circuit Voltage (Voc) of PV modules not exceeds max. PV input voltage of inverter (on technical datasheet).
2) Open circuit Voltage (Voc) of PV modules should be higher than start up DC voltage (on technical datasheet).

2.4.2.2 PV Module Wire Connection

⚠️ Please don't connect PV array positive or negative pole to the ground, it could cause serious damages to the inverter.

⚠️ Before connection, please make sure the polarity of the output voltage of PV array matches the "DC+" and "DC-" symbols.

⚠️ Please use approved DC cable for PV system.

DC+ male connector (MC4)   DC- female connector (MC4)
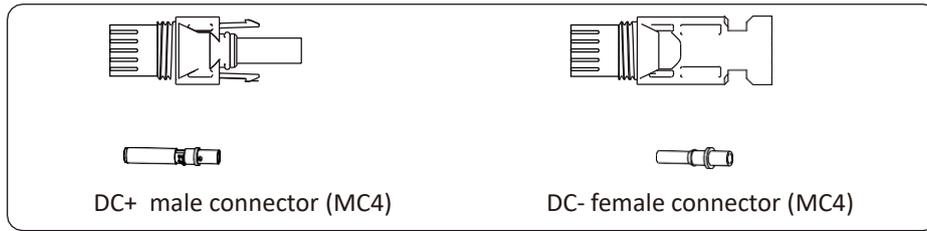
Cable type	Cross section (mm)	
	Range	Recommended value
Industry generic PV cable (model: PV1-F)	4.0~6.0 (12~10AWG)	4.0(12AWG)

The steps to assemble the DC connectors are listed as follows:

a) Strip off the DC wire about 7mm, disassemble the connector cap nut, see below:
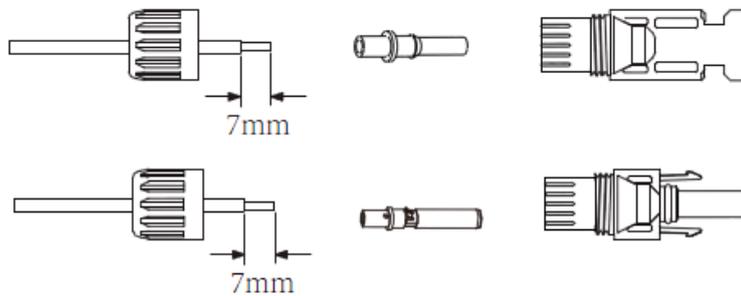
b) Crimping metal terminals with crimping pliers, see below:

Crimping plier ———

c) Insert the contact pin to the top part of the connector and screw up the cap nut to the top part of the connector, see below:
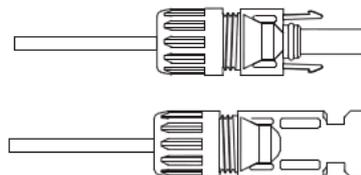
d) Finally insert the DC connector into the positive and negative input of the inverter.
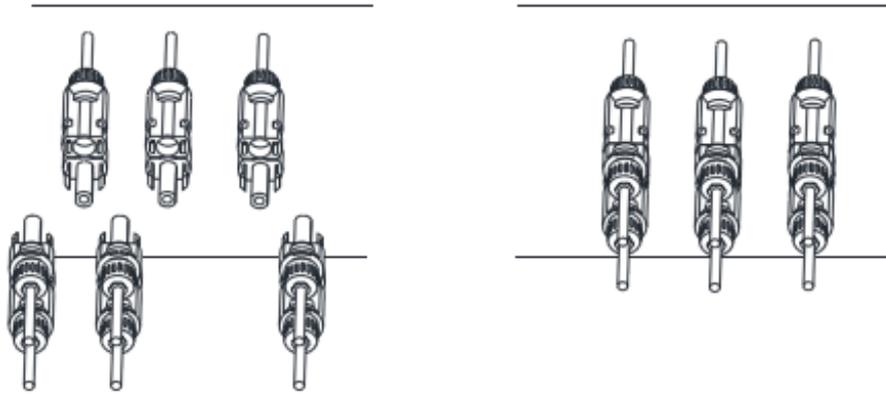
⚠️ WARING

Sunlight shines on the panel will generate voltage, high voltage in series may cause danger to life. Therefore, before connecting the DC input line, the solar panel needs to be blocked by the opaque material and the DC switch and circuit breaker should be 'OFF', otherwise, the high voltage of the inverter may lead to life-threatening conditions.

⚠️ WARING

Use the DC power connector of the accessories. Do not interconnect the connectors of different manufacturers.

2.4.3 Grid Connection

The power Grid connects to the Input Grid terminal (1/2) through the AC BOX.   After the air switch (QF1) control, the power grid connects to the inverter through the AC Output inverter (3/4) terminal.

a) Before making Grid, be sure to turn off the breaker first.
b) Remove insulation sleeve 10mm length, unscrew the bolts, insert the wires according to polarities indicated on the terminal block and tighten the terminal screws. Make sure the connection is complete.
c) Then insert AC output wires according to polarities indicated on the terminal block and tighten terminal. Be

sure to connect corresponding N wires and PE wires to related terminals as well.

d) Make sure the wires are securely connected.

e) Appliances such as air conditioner are required at least 2-3 minutes to restart because it is required to have enough time to balance refrigerant gas inside of circuit. If a power shortage occurs and recovers in short time, it will cause damage to your connected appliances. To prevent this kind of damage, please check manufacturer of air conditioner if it is equipped with time-delay function before installation. Otherwise, this inverter will trigger overload fault and cut off output to protect your appliance but sometimes it still causes internal damage to the air conditioner.

2.4.4 HOME LOAD Connection

The home load is connected to the load through the AC Output home load (7/8) wiring terminal after the circuit breaker (QF2) control.
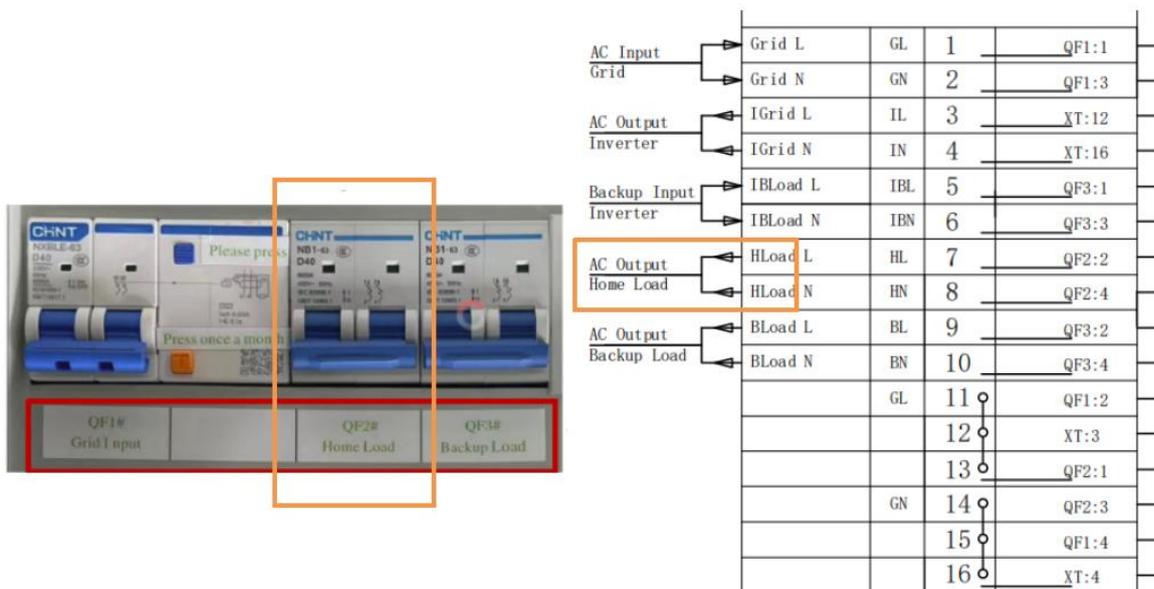
2.4.5 BACKUP LOAD Connection

The backup load is connected to the load through the AC Output backup load (7/8) wiring terminal after the circuit breaker (QF3) control.
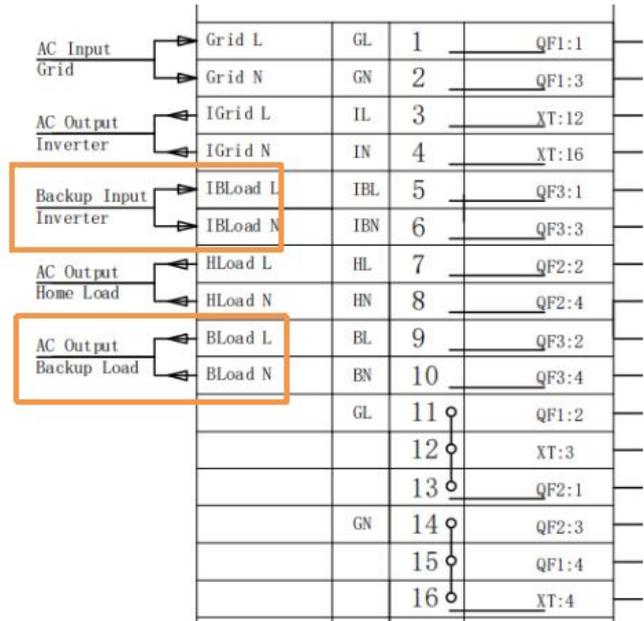
2.4.6 GENSET Connection

  After the generator is controlled by the circuit breaker (QF4), connect the AC output inverter (19/20) wiring terminal to the GEN side of the inverter
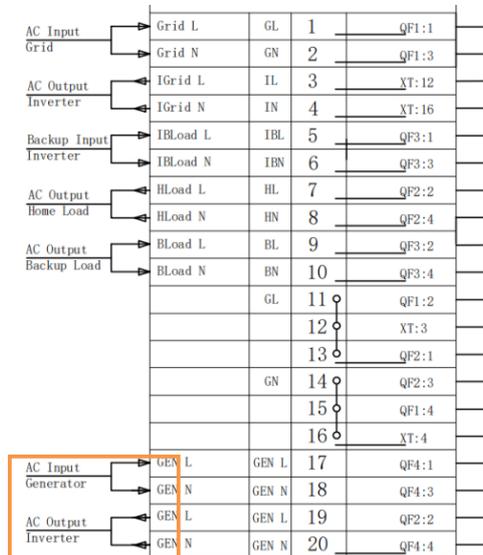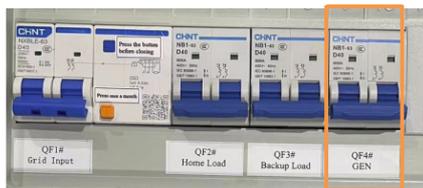
2.4.7 External CT Connection
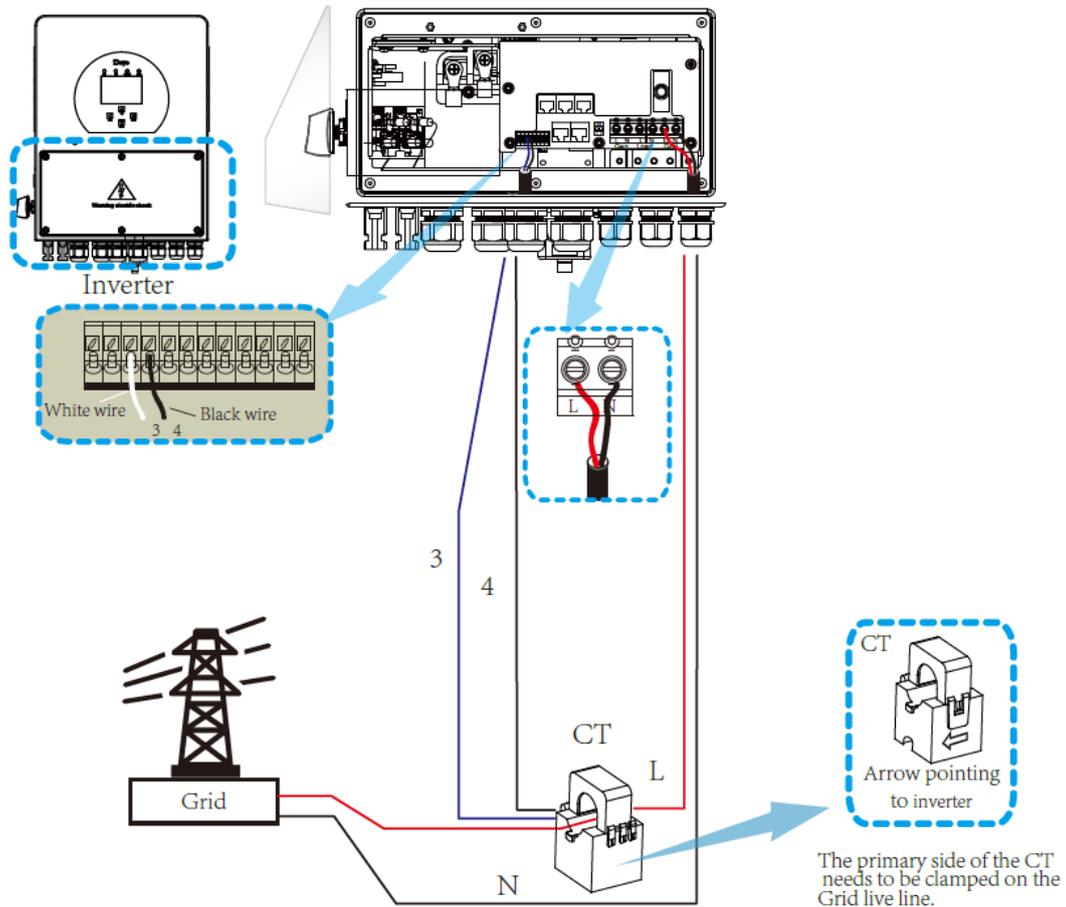
Single phase

2.4.8 GEN START connection

The inverter has dry contact signal for startup the diesel generator.

Single phase inverter
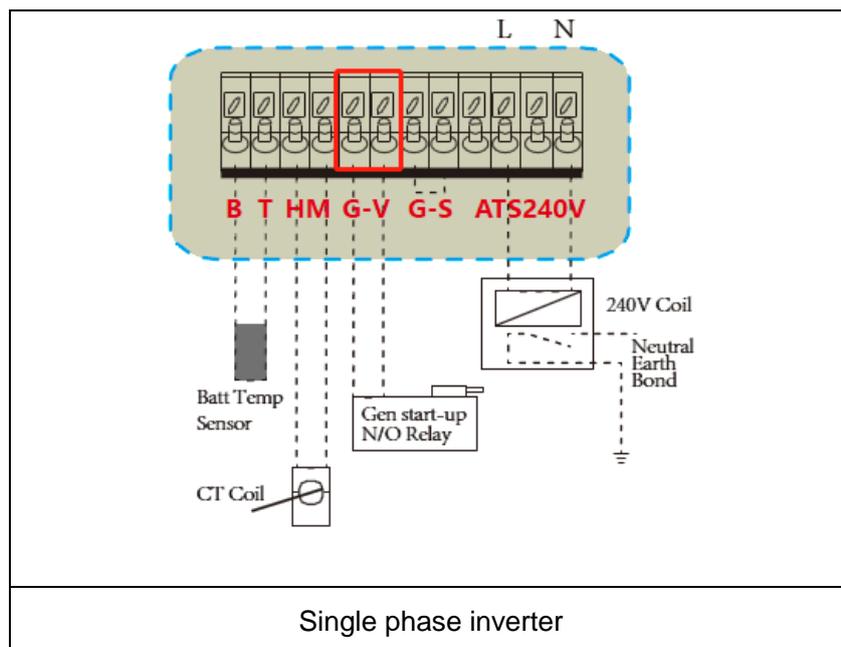
2.4.9 Earth Connection (mandatory)

Ground cable shall be connected to ground plate on grid side which prevents electric shock if the original protective conductor fails.

Ground of single phase inverter	
Ground of three phase inverter	
Ground of AC backup box	
Ground of the battery	
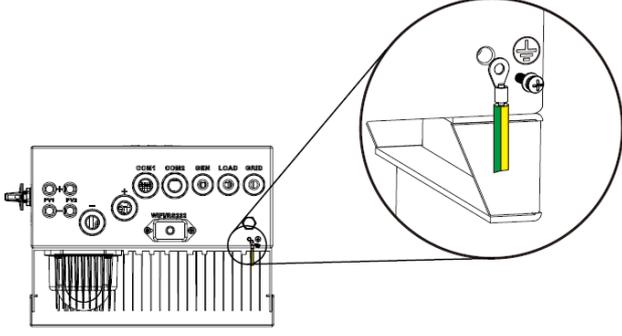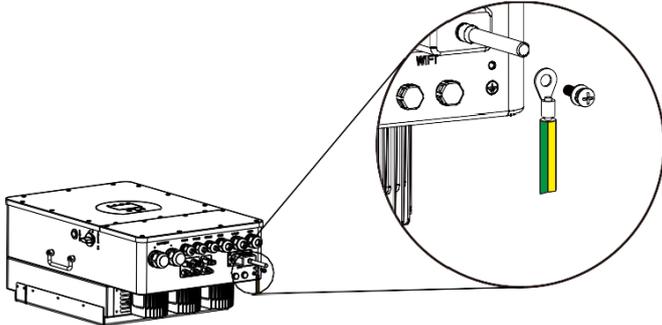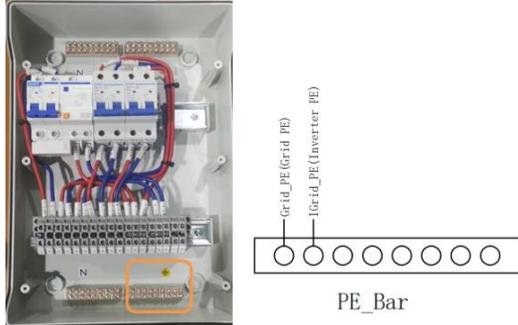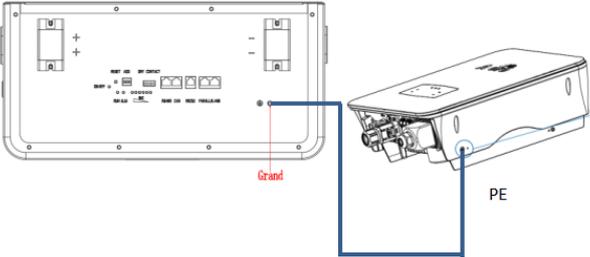
3. System Operation

3.1 Lithium Battery

Battery pack parallel description

The paralleled batteries need to be connected by RJ45 communication cables.

inverter

master   slave   slave

battery pack   battery pack   battery pack

Master

Inverter   Computer

Battery pack

RESET ADD   DRY CONTACT

ON/OFF

RUN ALM   SOC

Communication Monitor UP Down

RS485 CAN RS232 PARALLEL485

slave

Battery pack

RESET ADD   DRY CONTACT

ON/OFF

RUN ALM   SOC

Communication Monitor UP Down

RS485 CAN RS232 PARALLEL485

slave

Battery pack

RESET ADD   DRY CONTACT

ON/OFF

RUN ALM   SOC

Communication Monitor UP Down

RS485 CAN RS232 PARALLEL485

Setting DIP Switches

The communication between the inverter and battery is CANBUS and the battery should be set Address "1" by DIP switch.

The other batteries (if there are) should be set other individual address. When packs are used in parallel, you can set the address of the DIP switch on the BMS to distinguish different packs. Avoid setting the same address. For the definition of the DIP switch on the packs, see the following table. The master address number is "1".
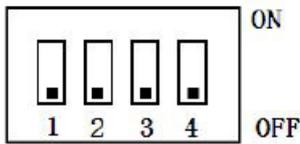
Communication Address	DIP			
	#1	#2	#3	#4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

Automatic Coding Settings

After the parallel line is connected, press the reset button for 3~6S, and the system starts up and automatically codes. If coding fails, all indicators on a single node blink.
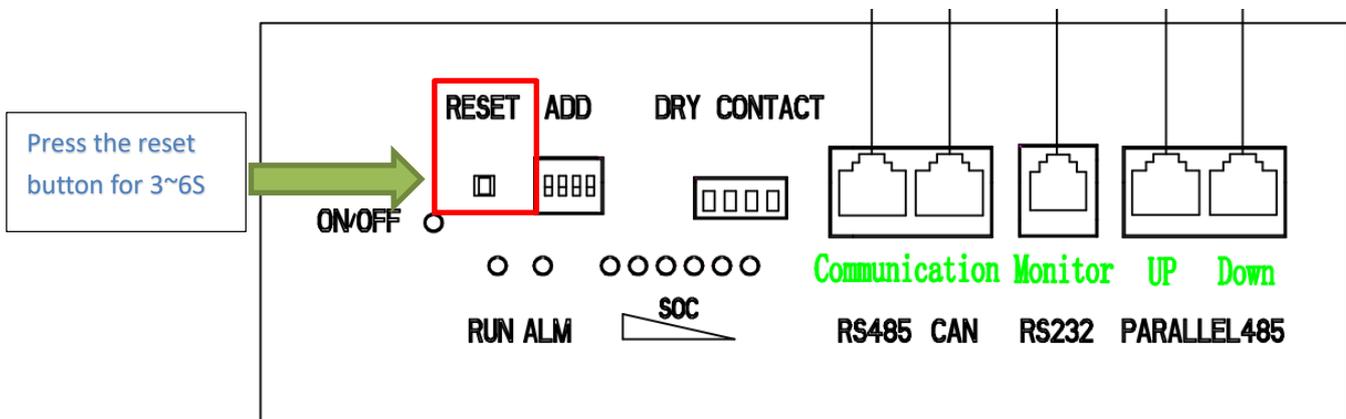
Battery data display

The battery data is displayed on the battery pack LCD screen, which displays the operating status, voltage, and temperature of the battery pack.

![SEMCOKii logo]

> ⚠️ You can select either the DIP switch or the automatic encoding function of the battery pack. For the encoding mode supported, see the technical specifications of the battery pack.

Show location	Display Content		Display Description	
Page 1	SOC: 37.31% Vsum: 52.5 V Im: 0.0 A State: Idle Fault: ON	SOC	State of capacity	/
		Vsum	Total voltage of the battery pack	/
		Im	Total current of the battery pack	/
		State	The operating state of a battery pack	See State Type Description for details
		Fault	The fault type is displayed	If "ON" is displayed, no fault occurs
Page 2	Max_V: 3283mV Max_V NO.4 Min_V: 3281mV Min_V NO.16	Max_V	Max monomer voltage	/
		Max_V NO.	The number of max monomer	/
		Min_V	Min monomer voltage	/
		Min_V NO.	The number of min monomer	/
Page 3	Max_T: 16.7℃ Max_T NO.5 Min_T: 14.4℃ Min_T NO.1 Max_M_T: 16.7℃	Max_T	Max monomer temperature	/
		Max_T NO.	The number of max monomer	/
		Min_T	Min monomer temperature	/
		Min_T NO.	The number of min monomer	/
		Min_M_T	Max MOS temperature	/
Status Type Description		Idle	Free	/
		CHG	Charge	/
		DSG	Discharge	/
		Failure	Failure	/

Show location	Display Content		Display Description	
		Full	The battery is fully charged	/
		"xxP"	Protection	/

3.2 Power ON/OFF

Once the unit has been properly installed and the batteries are connected well, turn the battery switch to the ON position, there will be voltage output on the positive and negative poles of the battery. Closing DC circuit breaker in DC backup box.
And inverter is simply pressed On/Off button (located on the left side of the case) to turn on the unit. When system is without battery connected, but connected with either PV or grid, and ON/OFF button is switched off, LCD will still light up (Display will show OFF). In this condition, when switch on ON/OFF button and select NO battery, system can still work.

3.3 Inverter Operation and Display Panel

The operation and display panel, shown in below chart, is on the front panel of the inverter. It includes four indicators, four function keys and a LCD display, indicating the operating status and input/output power information.

LED Indicator		Messages
DC	Green led solid light	PV Connection normal
AC	Green led solid light	Grid Connection normal
Normal	Green led solid light	Inverter operating normal
Alarm	Red led solid light	Malfunction or warning

LED Indicators

Function Key	Description
Esc	To exit setting mode
Up	To go to previous selection
Down	To go to next selection
Enter	To confirm the selection

Function Buttons

4. LCD Display Icons

4.1 Main Screen

The LCD is touchscreen, below screen shows the overall information of the inverter.
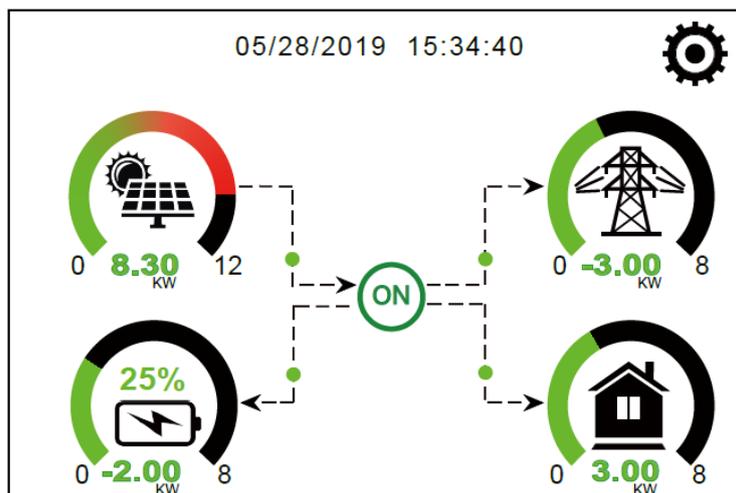
1. The icon in the center of the home screen indicates that the system is Normal operation. If it turns into "comm./FXX" , it means the inverter has communication errors or other errors, the error message will display under this icon (FXX errors, detail error info can be viewed in the System Alarms menu).

2. At the top of the screen is the time.

3. System Setup Icon, Press this set button, you can enter into the system setup screen which including Basic Setup, Battery Setup, Grid Setup, System Work Mode, Generator port use, Advanced function and Li-Batt info.

4. The main screen showing the info including Solar, Grid, Load and Battery. It's also displaying the energy flow direction by arrow. When the power is approximate to high level, the color on the panels will changing from green to red so system info showing vividly on the main screen.

➤ PV power and Load power always keep positive.
➤ Grid power negative means sell to grid, positive means get from grid.
➤ Battery power negative means charge, positive means discharge.

4.1.1 LCD Operation Flow Chart
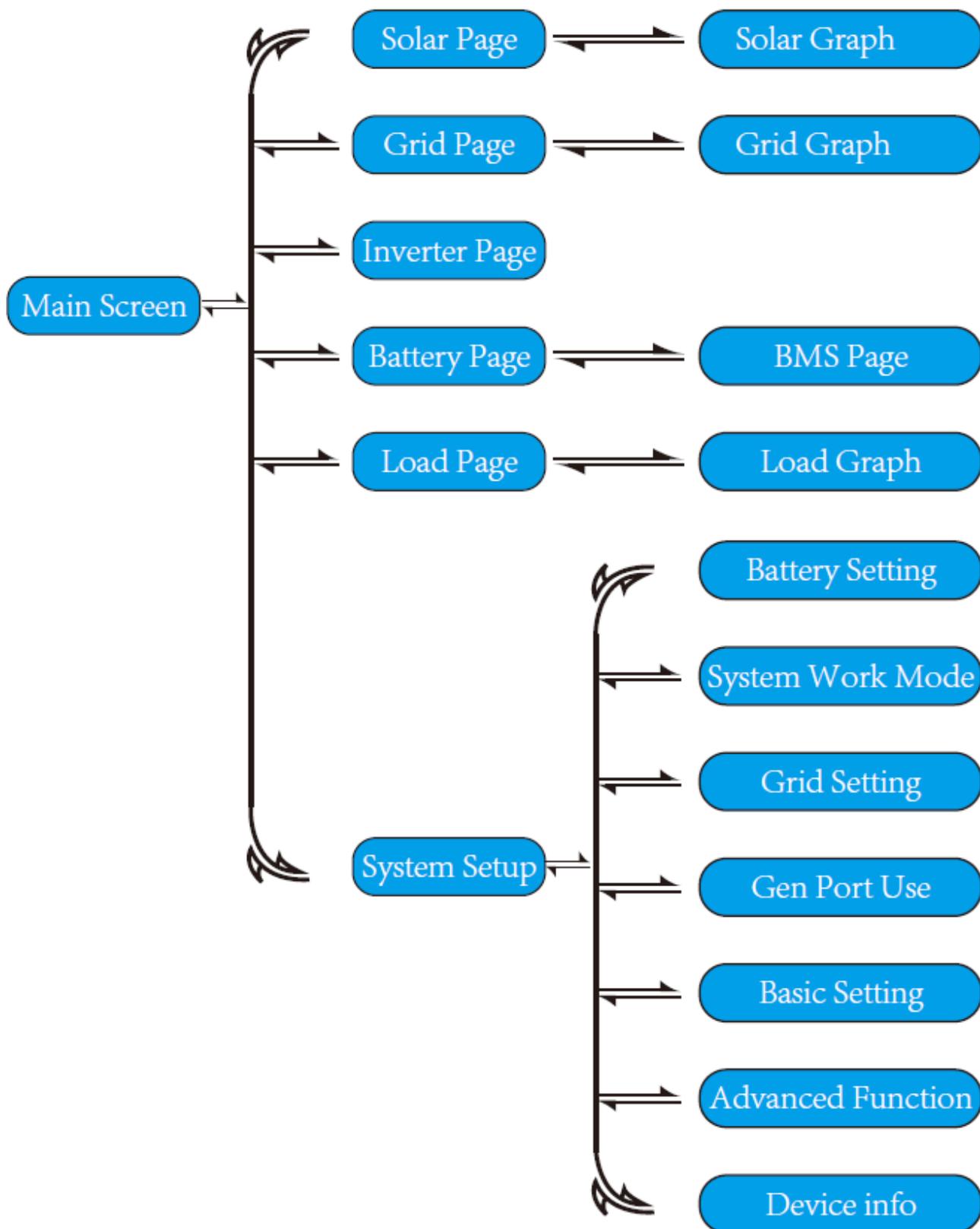
4.2 Solar Power Curve

Single Phase Inverter

Solar	
Power: 1560W ①	Today=8.0 KWH ③
PV1-V: 286V PV2-V: 45V ②	Total =12.00 KWH
PV1-I: 5.5A PV2-I: 0.0A	
P1: 1559W P2: 1W	
	Energy

This is Solar Panel detail page.
① Solar Panel Generation.
② Voltage, Current, Power for each MPPT.
③ Solar Panel energy for Day and Total.

Press the "Energy "button will enter into the power curve page.

Inverter	
Power: 44W ①	DC-T:52.6C ③
L1: 240V ②	AC-T:41.0C
I1:0.6A	

This is Inverter detail page.
① Inverter Generation.
② Voltage, Current, Power for each Phase.
③ *DC-T: mean DC-DC temperature,
   AC-T: mean Heat-sink temperature.
   *Note: this part info is not avaiable for some LCD FW.

Load	
Power: 0W ①	Today=0.0 KWH ③
L: 0V ②	Total =0.40 KWH
	Energy

This is Back-up Load detail page.
① Back-up Power.
② Voltage, Power for each Phase.
③ Back-up consumption for Day and Total.

Press the "Energy " button will enter into the power curve page.

Grid	
Stand-by ①	BUY ③
Power: 0W	Today=2.2KWH
0.0Hz	Total =11.60 KWH
	SELL
0V 0.0A ②	Today=0.0KWH
CT: 0W	Total =8.60 KWH
LD: 0W	
	Energy

This is Grid detail page.
① Status, Power, Frequency.
② L: Voltage for each Phase
   CT: Power detected by the external current sensors
   LD: Power detected using internal sensors on AC grid in/out breaker
③ BUY: Energy from Grid to Inverter,
   SELL: Energy from Inverter to grid.
Press the "Energy " button will enter into the power curve page.

Three Phase Inverter

Solar	
Power: 1560W ①	Today=8.0 KWH ③
PV1-V: 286V PV2-V: 45V ②	Total =12.00 KWH
PV1-I: 5.5A PV2-I: 0.0A	
P1: 1559W P2: 1W	
	Energy

This is Solar Panel detail page.

① Solar Panel Generation.

② Voltage, Current, Power for each MPPT.

③ Solar Panel energy for Day and Total.

Press the "Energy "button will enter into the power curve page.

	1244w 50Hz	-81w 50Hz ①
1166w	222v 0.8w	222v 0.1A
221v 0w	229v 5.0w	230v 0.1A
229v 1166w	229v 0.9w	223v 0.1A
225v 0w	HM: LD:	INV_P:
	-10W 28W	-30W
Load	5W 1192W	-26W AC_T:
SOC:99%	0W 24W	-25W 38.8C
-21w	**Grid**	**Inverter**
BAT_V:53.65V		
BAT_I: -0.41A	DC_P1: 0W	DC_P2: 0W
BAT_T: 27.0C	DC_V1: 0V	DC_V2: 0V
	DC_I1: 0.0A	DC_I2: 0.0A
Battery	**PV1**	**PV2**

This is Inverter detail page.

① Inverter Generation.

Voltage, Current, Power for each Phase.

AC-T: mean Heat-sink temperature.

Load	
Power: 55W ①	Today=0.5 KWH ③
	Total =1.60 KWH
L1: 220V P1: 19W	②
L2: 220V P2: 18W	
L3: 220V P3: 18W	
	Energy

This is Back-up Load detail page.

① Back-up Power.

② Voltage, Power for each Phase.

③ Back-up consumption for Day and Total.

Press the "Energy " button will enter into the power curve page.

Grid	
Stand by ①	BUY ③
0W	Today=2.2KWH
0.0Hz	Total =11.60 KWH
	SELL
CT1: 0W LD1: 0W ②	Today=0.0KWH
CT2: 0W LD2: 0W	Total =8.60 KWH
CT3: 0W LD3: 0W	
L1: 0V L2: 0V L3: 0V	Energy

This is Grid detail page.

① Status, Power, Frequency.

② L: Voltage for each Phase

CT: Power detected by the external current sensors

LD: Power detected using internal sensors on AC grid in/out breaker

③ BUY: Energy from Grid to Inverter,

SELL: Energy from Inverter to grid.

Press the "Energy " button will enter into the power curve page.

Lithium Battery

These are Battery detail page and BMS page.

Li-BMS

Mean Voltage:50.34V	Charging Voltage :53.2V
Total Current:55.00A	Discharging Voltage :47.0V
Mean Temp :23.5C	Charging current :50A
Total SOC :38%	Discharging current :25A
Dump Energy:57Ah	

Sum Data

Details Data

Batt

Stand-by

SOC: 36%

U:50.50V

I:-58.02A

Power: -2930W

Temp:30.0C

Li-BMS

Li-BMS

	Volt	Curr	Temp	SOC	Energy	Charge Volt	Charge Curr	Fault
1	50.38V	19.70A	30.6C	52.0%	26.0Ah	0.0V	0.0A	0|0|0
2	50.33V	19.10A	31.0C	51.0%	25.5Ah	53.2V	25.0A	0|0|0
3	50.30V	16.90A	30.2C	12.0%	6.0Ah	53.2V	25.0A	0|0|0
4	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0
5	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0
6	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0
7	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0
8	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0
9	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0
10	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0
11	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0
12	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0
13	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0
14	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0
15	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0

Sum Data

Details Data

4.3 Curve Page-Solar & Load & Grid

Solar Power Production:Day

3000W 2019-5-28

CANCEL Day Month Year Total

System Solar Power:Month

2000Wh 5-2019

CANCEL Day Month Year Total

System Solar Power:Year

KWh 2019

CANCEL Day Month Year Total

System Grid Power:Total

2000KWh TOTAL

CANCEL Day Month Year Total

Solar power curve for daily, monthly, yearly and total can be roughly checked on the LCD, for more accuracy

power generation, pls check on the monitoring system. Click the up and down arrow to check power curve of different period.

4.4 System Setup Menu
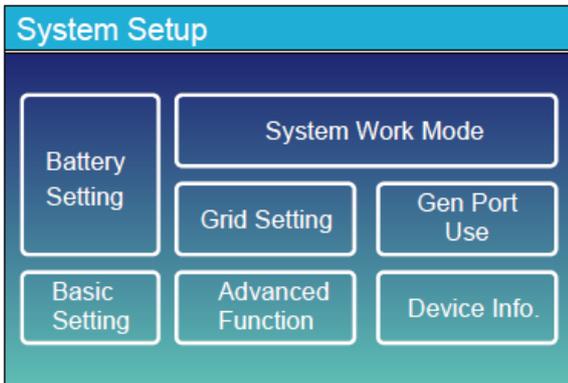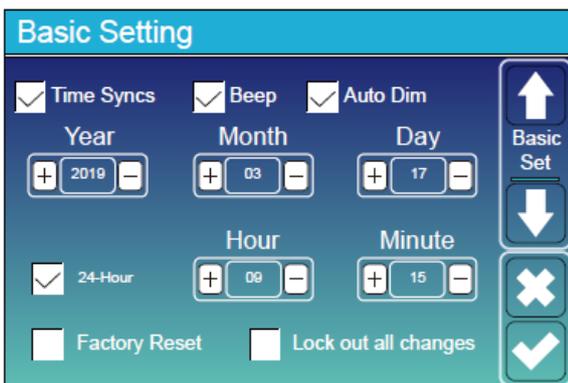
4.5 Basic Setup Menu

4.6 Battery Setup Menu

Battery Setting

Batt Mode
- ○ Lithium   Batt Capacity   [400Ah]   Batt Mode
- ○ Use Batt V   Max A Charge   [40A]
- ○ Use Batt %   Max A Discharge   [40A]
- ○ No Batt   □ Activate Battery
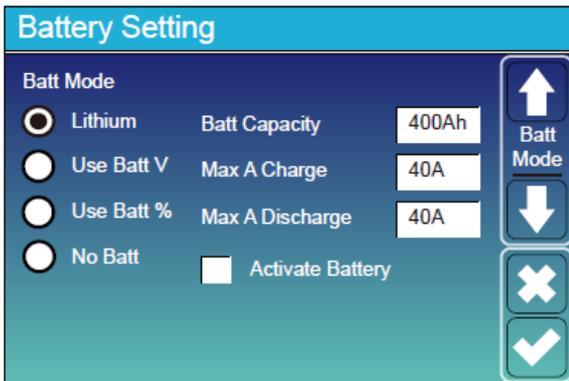
Battery capacity: it tells hybrid inverter to know your battery bank size.

Use Batt V: Use Battery Voltage for all the settings (V).

Use Batt %: Use Battery SOC for all the settings (%).

Max. A charge/discharge: Max battery charge/discharge current(0-115A for 5KW model, 0-90A for 3.6KW model). For AGM and Flooded, we recommend Ah battery size x 20%= Charge/Discharge amps.
. For Lithium, we recommend Ah battery size x 50% = Charge/Discharge amps.
. For Gel, follow manufacturer's instructions.

No Batt: tick this item if no battery is connected to the system.

Active battery: This feature will help recover a battery that is over discharged by slowly charging from the solar array or grid.

Battery Setting

- Start [30%]   [30%] ②
- A ① [40A]   [40A]   Batt Set2
- □ Gen Charge   □ Grid Charge
- □ Gen Signal   □ Grid Signal
- □ Gen Force ③
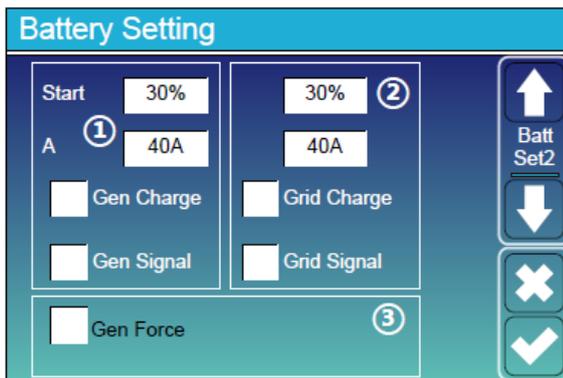
This is Battery Setup page.   ① ③

Start =30%: Percent S.O.C at 30% system will AutoStart a connected generator to charge the battery bank.

A   = 40A: Charge rate of 40A from the attached generator in Amps.

Gen Charge: uses the gen input of the system to charge battery bank from an attached generator.

Gen Signal: Normally open relay that closes when the Gen Start signal state is active.

Gen Force: When the generator is connected, it is forced to start the generator without meeting other conditions.

This is Grid Charge, you need select.   ②

Start =30%: No use，Just for customization.

A   = 40A: It indicates the Current that the Grid charges the Battery.

Grid Charge: It indicates that the grid charges the battery.

Grid Signal: Disable.

07/08/2021 11:11:10   Thu ⚙

0 **2.00** 7 KW

0 **0.00** 5 KW

76%   ON   Signal on

0 **-1.39** 5 KW

0 **2.00** 5 KW
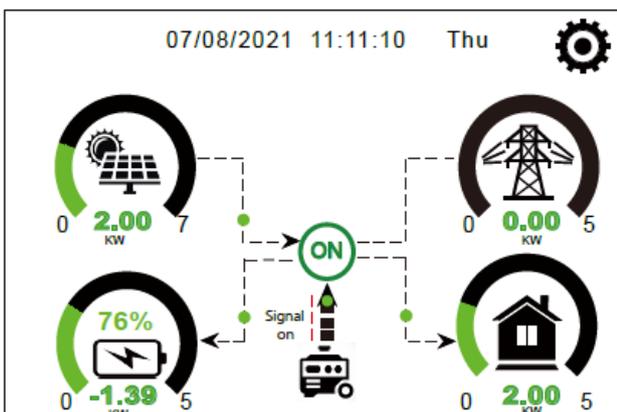
This page tells the PV and diesel generator power the load and battery.

Single phase

Generator

Power: 1392W   Today=0.0 KWH
                 Total =2.20 KWH

L1: 228V

Freq:50.0Hz

This page tells generator output voltage, frequency, power. And, how much energy is used from generator.

Three phase

Generator

Power: 6000W   Today=10 KWH
                 Total =10 KWH

V_L1: 230V   P_L1: 2KW
V_L2: 230V   P_L2: 2KW
V_L3: 230V   P_L3: 2KW

This page tells generator output voltage, frequency, power. And, how much energy is used from generator.

Battery Setting

Float V   ① 53.6V   Shutdown ③ 20%
Absorption V   57.6V   Low Batt   35%
Equalization V   57.6V   Restart   50%
Equalization Days 30 days   TEMPCO(mV/C/Cell)
Equalization Hours 3.0 hours ② -5
                            Batt Resistance
                            25mOhms

Batt Set3

There are 3 stages of charging the Battery . ①

This is for professional installers, you can keep it if you do not know. ②

Shutdown 20%: The inverter will shutdown if the SOC below this value.

Low Batt 35%: The inverter will alarm if the SOC below this value. ③

Restart 50%: Battery SOC at 50% AC output will resume.

4.7 System Work Mode Setup Menu

Work Mode

Selling First: This Mode allows hybrid inverter to sell back any excess power produced by the solar panels to the grid. If time of use is active, the battery energy also can be sold into grid.

The PV energy will be used to power the load and charge the battery and then excess energy will flow to grid. Power source priority for the load is as follows:

1. Solar Panels.
2. Grid.
3. Batteries (until programmable % discharge is reached).

Zero Export to Load: Hybrid inverter will only provide power to the backup load connected. The hybrid inverter will neither provide power to the home load nor sell power to grid. The built-in CT will detect power flowing back to the grid and will reduce the power of the inverter only to supply the local load and charge the battery.
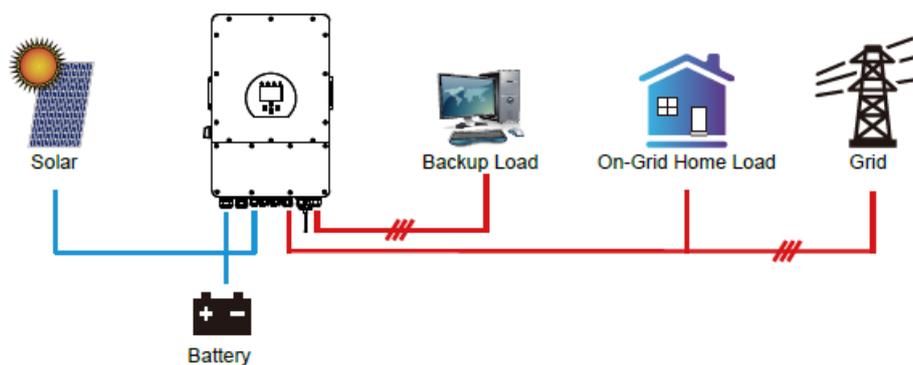
Zero Export to CT: Hybrid inverter will not only provide power to the backup load connected but also give power to the home load connected. If PV power and battery power is insufficient, it will take grid energy as supplement. The hybrid inverter will not sell power to grid. In this mode, a CT is needed. The installation method of the CT please refer to chapter 3.6 CT Connection. The external CT will detect power flowing back to the grid and will reduce the power of the inverter only to supply the local load, charge battery and home load.
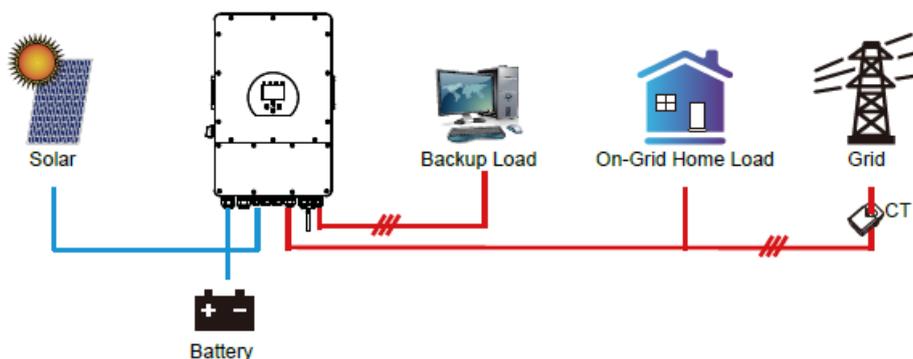
Solar Sell: "Solar sell" is for Zero export to load or Zero export to CT: when this item is active, the surplus energy can be sold back to grid. When it is active, PV Power source priority usage is as follows: load consumption and charge battery and feed into grid.

Max. Sell power: Allowed the maximum output power to flow to grid.

Zero-export Power: for zero-export mode, it tells the grid output power. Recommend to set it as 20-100W to ensure the hybrid inverter won't feed power to grid.

Energy Pattern: PV Power source priority.

Batt First: PV power is firstly used to charge the battery and then used to power the load. If PV power is insufficient, grid will make supplement for battery and load simultaneously.

Load First: PV power is firstly used to power the load and then used to charge the battery. If PV power is insufficient, Grid will provide power to load.

Max Solar Power: allowed the maximum DC input power.

Grid Peak-shaving: when it is active, grid output power will be limited within the set value. If the load power exceeds the allowed value, it will take PV energy and battery as supplement. If still can't meet the load requirement, grid power will increase to meet the load needs.

System Work Mode

Grid Charge	Gen	Time Of Use			
		Time	Power	Batt	
☐	☐	01:00	5:00	12000	49.0V
☐	☐	05:00	9:00	12000	50.2V
☑	☐	09:00	13:00	12000	50.9V
☑	☐	13:00	17:00	12000	51.4V
☑	☐	17:00	21:00	12000	47.1V
☑	☐	21:00	01:00	12000	49.0V

Battery Setting

Start	30%		30%	
A	40A		40A	
☐ Gen Charge		☑ Grid Charge ①		
☐ Gen Signal		☑ Grid Signal		
Gen Max Run Time	0.0 hours			
Gen Down Time	0.5 hours			

System Work Mode

② Grid Charge	Gen	Time Of Use			
		Time	Power	Batt	
☑	☐	01:00	5:00	12000	80%
☑	☐	05:00	8:00	12000	40%
☐	☐	08:00	10:00	12000	40%
☑	☐	10:00	15:00	12000	100%
☐	☐	15:00	18:00	12000	40%
☐	☐	18:00	01:00	12000	35%

Time of use: it is used to program when to use grid or generator to charge the battery, and when to discharge the battery to power the load. Only tick "Time Of Use" then the follow items (Grid, charge, time, power etc.) will take effect.

Note: when in selling first mode and click time of use, the battery power can be sold into grid.

Grid charge: utilize grid to charge the battery in a time period.

Gen charge: utilize diesel generator to charge the battery in a time period.

Time: real time, range of 01:00-24:00.

Note: when the grid is present, only the "time of use" is ticked, then the battery will discharge. Otherwise, the battery won't discharge even the battery SOC is full. But in the off-grid mode (when grid is not available, inverter will work in the off-grid mode automatically).

Power: Max. discharge power of battery allowed.

Batt(V or SOC %): battery SOC % or voltage at when the action is to happen.

For example

During 01:00-05:00,
if battery SOC is lower than 80%, it will use grid to charge the battery until battery SOC reaches 80%.

During 05:00-08:00,
if battery SOC is higher than 40%, hybrid inverter will discharge the battery until the SOC reaches 40%. At the same time, if battery SOC is lower than 40%, then grid will charge the battery SOC to 40%.

During 08:00-10:00,
if battery SOC is higher than 40%, hybrid inverter will discharge the battery until the SOC reaches 40%.

During 10:00-15:00,
when battery SOC is higher than 80%, hybrid inverter will discharge the battery until the SOC reaches 80%.

During 15:00-18:00,
when battery SOC is higher than 40%, hybrid inverter will discharge the battery until the SOC reaches 40%.

During 18:00-01:00,
when battery SOC is higher than 35%, hybrid inverter will discharge the battery until the SOC reaches 35%.

4.8 Grid Setup Menu

Grid Setting

Grid Mode
- ● General Standard
- ○ UL1741 & IEEE1547
- ○ CPUC RULE21
- ○ SRD-UL-1741

Grid Level: 220V-3P
- 230V-3P
- 240V-3P
- 133V-3P
- 120V-3P

Phase Type
- ○ 0/120/240
- ● 0/240/120

(Grid Set1)

Please select the correct Grid Mode in your local area. If you are not sure, please choose General Standard.

Please select the correct Grid Type in your local area, otherwise the machine will not work or be damaged.

Phase type: When the inverter LCD shows "W03"which means the grid phase is error, please try to use "0/120/240".

Grid Setting

Grid Frequency
- ● 50HZ
- ○ 60HZ

Reconnection Time: 60S   PF: 1.000

Grid HZ High: 53.0Hz   Grid Vol High: 265.0V

Grid HZ Low: 49.0Hz   Grid Vol Low: 185.0V

INV Output voltage: 220V / 230V / 200V / 240V

(Grid Set2)

UL1741&IEEE1547，CPUC RULE21，SRD-UL-1741

No need to set the function of this interface.

General Standard

Please select the correct Grid Frequency in your local area.
You can hole this in default value.

Grid Setting

☐ Q(V)   ☐ FW   ☐ VW

V1:0.0V Q1:0.00 Fstart:0.00Hz Vstart:0.0V

V2:0.0V Q2:0.00 Fstop:0.00Hz Vstop:0.0V

V3:0.0V Q3:0.00 Normal Ramp rate 0.0%/s

V4:0.0V Q4:0.00 Soft Start Ramp rate 0.0%/s

(Grid Set3)

For California only.

Grid Setting

☐ L/HVRT   ☐ L/HFRT

HV2:0.0V 0.16S

HV1:0.0V 0.16S   HF2:0.00HZ 0.16S

LV1:0.0V 0.16S   HF1:0.00HZ 0.16S

LV2:0.0V 0.16S   LF1:0.00HZ 0.16S

LV3:0.0V 0.16S   LF2:0.00HZ 0.16S

(Grid Set4)

For California only.

4.9 Generator Port Use Setup Menu
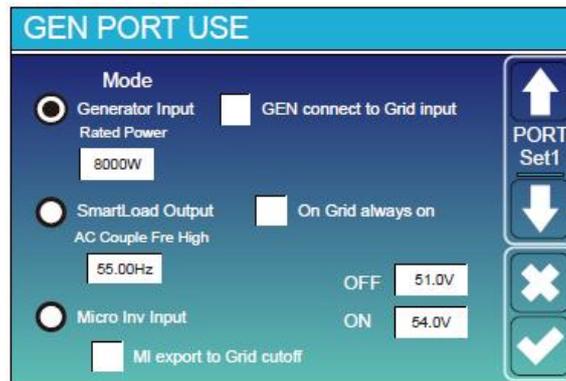
Generator input rated power: allowed Max. power from diesel generator.

GEN connect to grid input: connect the diesel generator to the grid input port.

Smart Load Output: This mode utilizes the Gen input connection as an output which only receives power when the battery SOC and PV power is above a user programmable threshold.

e.g. ON: 100%, OFF=95%: When the PV power exceeds 500W, and battery bank SOC reaches 100%, Smart Load Port will switch on automatically and power the load connected. When the battery bank SOC < 95%, the Smart Load Port will switch off automatically.

Smart Load OFF Batt

• Battery SOC at which the Smart load will switch off.

Smart Load ON Batt

• Battery SOC at which the Smart load will switch on, simultaneously and then the Smart load will switch on.

On Grid always on: When click "on Grid always on" the smart load will switch on when the grid is present.

Micro Inv Input: To use the Generator input port as a micro-inverter on grid inverter input (AC coupled), this feature will also work with "Grid-Tied" inverters.

＊Micro Inv Input OFF: When the battery SOC exceeds setting value, micro-inverter or grid-tied inverter will shut down.

＊Micro Inv Input ON: When the battery SOC is lower than setting value, micro-inverter or grid-tied inverter will start to work.

AC Couple Fre High: If choosing "Micro Inv input", as the battery SOC reaches gradually setting value (OFF), During the process, the micro-inverter output power will decrease linear. When the battery SOC equals to the setting value (OFF), the system frequency will become the setting value (AC couple Fre high) and the micro-inverter will stop working.

MI export to grid cutoff: Stop exporting power produced by the micro-inverter to the grid.

＊Note: Micro Inv Input OFF and On is valid for some certain FW version only.

4.10 Advanced Function Setup Menu

Solar Arc Fault ON: This is only for US.
System selfcheck: Disable. this is only for factory.
Gen Peak-shaving: Enable When the power of the generator exceeds the rated value of it, the inverter will provide the redundant part to ensure that the generator will not overload.
DRM: For AS4777 standard
Backup Delay: Reserved
BMS_Err_Stop: When it is active, if the battery BMS failed to communicate with inverter, the inverter will stop working and report fault.
Signal island mode: Reserved.

Ex_Meter For CT: when using zero-export to CT mode, the hybrid inverter can select EX_Meter For CT function and use the different meters.e.g.CHNT and Eastron.

4.11 Device Info Setup Menu

This page show Inverter ID, Inverter version and alarm codes.

HMI: LCD version

MAIN: Control board FW version

5. Limitation of Liability

In addition to the product warranty described above, the state and local laws and regulations provide financial compensation for the product's power connection (including violation of implied terms and warranties). The company hereby declares that the terms and conditions of the product and the policy cannot and can only legally exclude all liability within a limited scope.

Error Code	Description	Solutions
F01	DC input polarity reverse fault	1. Check the PV input polarity; 2. Seek help from us, if cannot go back to normal state.
F07	DC_START_Failure	1. The BUS voltage can't be built from PV or battery; 2. Restart the inverter, If the fault still exists, please contact us for help.
F13	Working mode change	1. When the grid type and frequency changed it will report F13; 2. When the battery mode was changed to "No battery" mode, it will report F13; 3. For some old FW version, it will report F13 when the system work mode changed; 4. 4, Generally, it will disappear automatically when shows F13; 5. If still same, and turn off the DC switch and AC switch and wait for one minute and then turn on the DC/AC switch; 6. Seek help from us, if cannot go back to normal state.
F15	AC over current fault of software	AC side over current fault 1. Please check whether the backup load power and common load power are within the range; 2. Restart and check whether it is in normal; 3. Seek help from us, if cannot go back to normal state.
F16	AC leakage current fault	Leakage current fault 1. Check the PV side cable ground connection; 2. Restart the system 2-3 times; 3. If the fault still existing, please contact us for help.
F18	AC over current fault of hardware	AC side over current fault 1. Please check whether the backup load power and common load power are within the range; 2. Restart and check whether it is in normal; 3. Seek help from us, if cannot go back to normal state.
F20	DC over current fault of hardware	DC side over current fault 1. Check PV module connect and battery connect; 2. When in the off-grid mode, the inverter startup with big power load, it may report F20. Please reduce the load power connected; 3. Turn off the DC switch and AC switch and then wait one minute, then turn on the DC/AC switch again; 4. Seek help from us, if cannot go back to normal state.

Error code	Description	Solutions
F21	Tz_HV_Overcurr_fault	BUS over current 1. Check the PV input current and battery current setting; 2. Restart the system 2~3 times; 3. If the fault still exists, please contact us for help.
F22	Tz_EmergStop_Fault	Remotely shutdown 1. It tells the inverter is remotely controlled.
F23	Tz_GFCI_OC_ current is transient over current	Leakage current fault 1. Check PV side cable ground connection; 2. Restart the system 2~3 times; 3. If the fault still exists, please contact us for help.
F24	DC insulation failure	PV isolation resistance is too low 1. Check the connection of PV panels and inverter is firmly and correctly; 2. Check whether the PE cable of inverter is connected to ground; 3. Seek help from us, if cannot go back to normal state.
F26	The DC busbar is unbalanced	1. Please wait for a while and check whether it is normal; 2. When the load power of 3 phases is big different, it will report the F26. 3. 3 .When there's DC leakage current, it will report F26 4. Restart the system 2~3 times. 5. Seek help from us, if cannot go back to normal state.
F48	AC lower frequency	Grid frequency out of range 1. Check the frequency is in the range of specification or not; 2. Check whether AC cables are firmly and correctly connected; 3. Seek help from us, if cannot go back to normal state.
F29	Parallel CAN Bus fault	1. When in parallel mode, check the parallel communication cable connection and hybrid inverter communication address setting; 2. During the parallel system startup period, inverters will report F29. But when all inverters are in ON status, it will disappear automatically; 3. If the fault still exists, please contact us for help.
F34	AC Overcurrent fault	1. Check the backup load connected, make sure it is in allowed power range; 2. If the fault still exists, please contact us for help.
F41	Parallel system stop	1. Check the hybrid inverter work status. If there is 1 pcs hybrid inverter shutdown, all hybrid inverters will report F41 fault. 2. If the fault still exists, please contact us for help.
F42	AC line low voltage	Grid voltage fault 1. Check the AC voltage is in the range of standard voltage in specification; 2. Check whether grid AC cables are firmly and correctly connected; 3. Seek help from us, if cannot go back to normal state.

Error code	Description	Solutions
F46	backup battery fault	1. Please check each battery status, such as voltage / SOC and parameters etc., and make sure all the parameters are same. 2. If the fault still exists, please contact us for help.
F47	AC over frequency	Grid frequency out of range 1. Check the frequency is in the range of specification or not; 2. Check whether AC cables are firmly and correctly connected; 3. Seek help from us, if cannot go back to normal state.
F48	AC lower frequency	Grid frequency out of range 1. Check the frequency is in the range of specification or not; 2. Check whether AC cables are firmly and correctly connected; 3. Seek help from us, if cannot go back to normal state.
F55	DC busbar voltage is too high	BUS voltage is too high 1. Check whether battery voltage is too high; 2. Check the PV input voltage, make sure it is within the allowed range; 3. Seek help from us, if cannot go back to normal state.
F56	DC busbar voltage is too low	Battery voltage low 1. Check whether battery voltage is too low; 2. If the battery voltage is too low, using PV or grid to charge the battery; 3. Seek help from us, if cannot go back to normal state.
F58	BMS communication fault	1. It tells the communication between hybrid inverter and battery BMS disconnected when "BMS_Err-Stop" is active". 2. If don't want to see this happen, you can disable "BMS_Err-Stop" item on the LCD. 3. If the fault still exists, please contact us for help.
F62	DRMs0_stop	1. The DRM function is for Australia market only. 2. Check the DRM function is active or not; 3. Seek help from us, if cannot go back to normal state after restart the system.
F34	AC Overcurrent fault	1. Check the backup load connected, make sure it is in allowed power range; 2. If the fault still exists, please contact us for help.
F63	ARC fault	1. ARC fault detection is only for US market; 2. Check PV module cable connection and clear the fault; 3. Seek help from us, if cannot go back to normal state.
F64	Heat sink high temperature failure	Heat sink temperature is too high 1. Check whether the work environment temperature is too high; 2. Turn off the inverter for 10mins and restart; 3. Seek help from us, if cannot go back to normal state.

6. Appendix I

Definition of RJ45 Port Pin for BMS

No.	RS485 Pin
1	485_B
2	485_A
3	--
4	CAN-H
5	CAN-L
6	GND_485
7	485_A
8	485_B

BMS Port
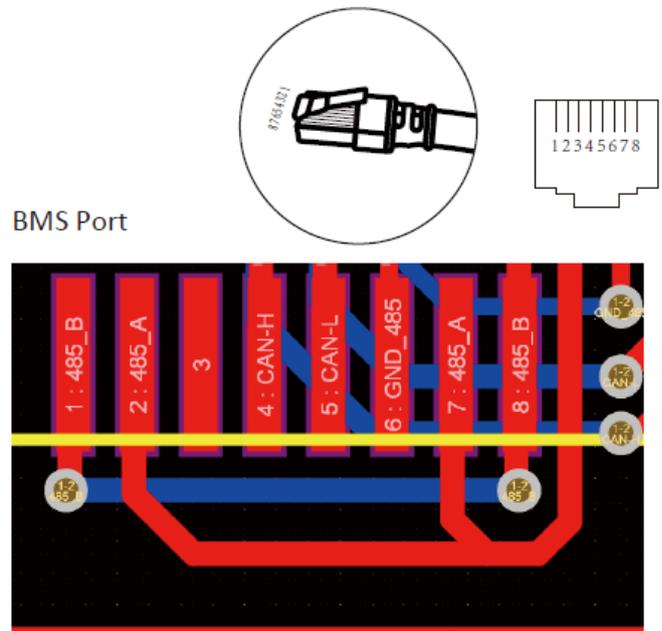
Definition of RJ45 Port Pin for Meter-485

No.	Meter-485 Pin
1	METER-485_B
2	METER-485_A
3	COM-GND
4	--
5	--
6	COM-GND
7	METER-485_A
8	METER-485_B

Meter-485 Port
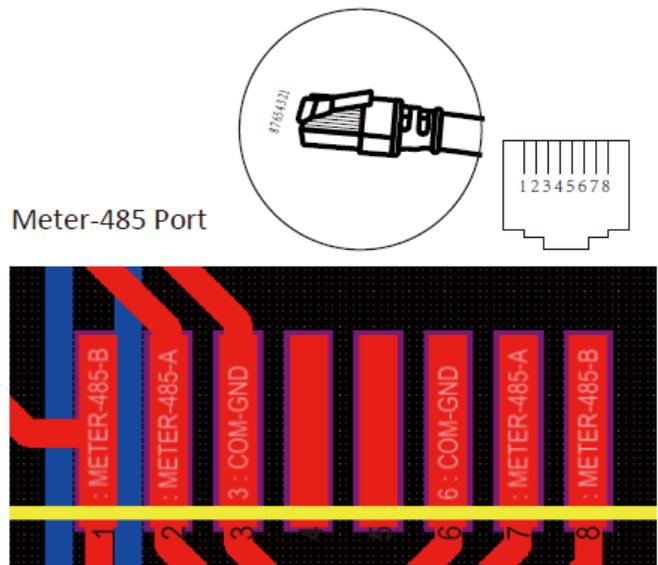
Definition of RJ45 Port Pin of "Modbus port" for remotely monitoring

No.	Modbus port
1	485_B
2	485_A
3	GND_485
4	--
5	--
6	GND_485
7	485_A
8	485_B

Modbus port
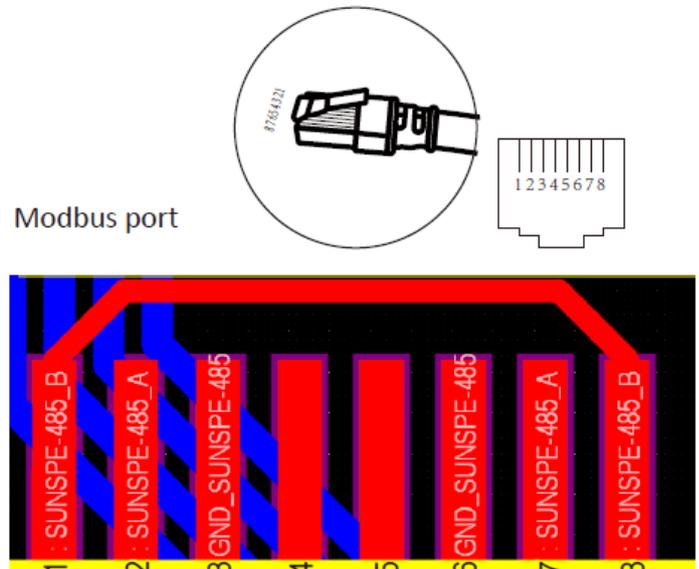
RS232

No.	WIFI/RS232
1	D-GND
2	
3	
4	
5	TX
6	RX
7	12Vdc
8	
9	
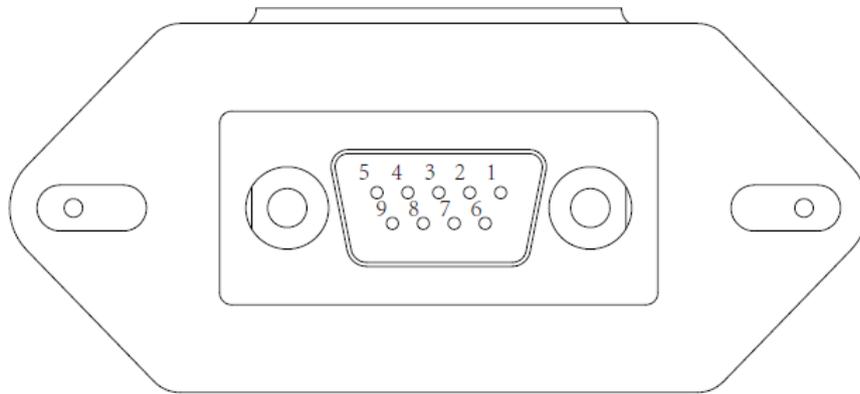
WIFI/RS232

This RS232 port is used to connect the WIFI data logger.

7. USER MANUAL for SOLARMAN Smart APP

Download APP

SOLARMAN Smart for end user	SOLARMAN Business for business
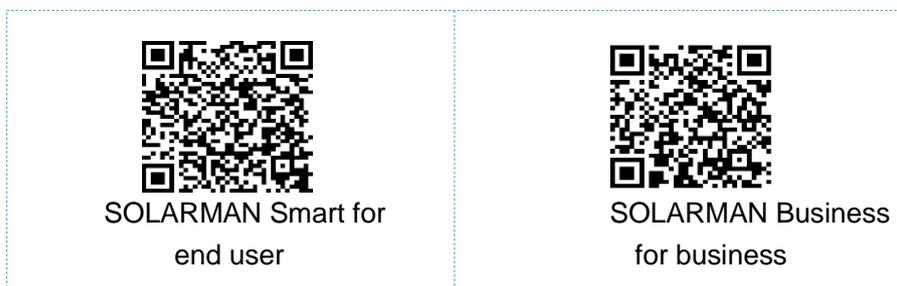
iPhone: Search "SOLARMAN Smart" in Apple Store.
Android: Search "SOLARMAN Smart" in Google Play.

7.1 Registration

Go to SOLARMAN Smart and register. Click "Register" and create your account here.
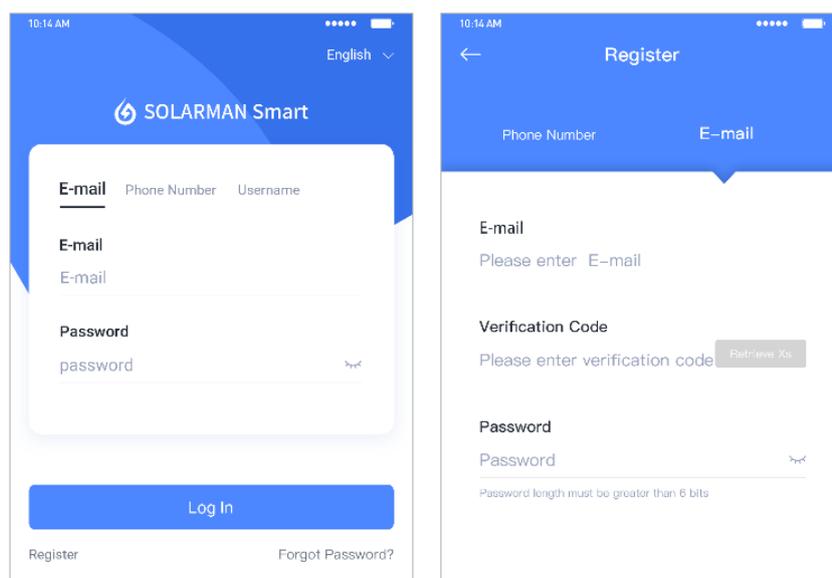
7.2 Create a Plant

Click "Add Now" to create your plant. Please fill in plant basic info and other info here.
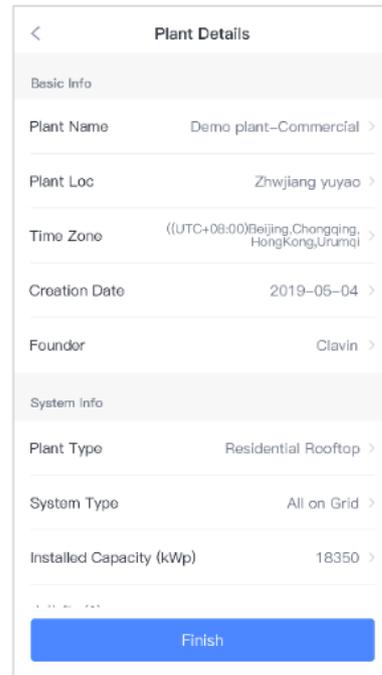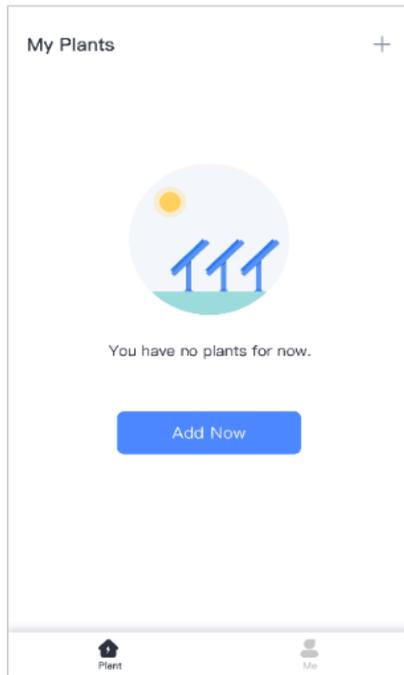
7.3 Add a Logger

Method 1: Enter logger SN manually.

Method 2: Click the icon in the right and scan to enter logger SN. You can find logger SN in the external packaging or on the logger body.
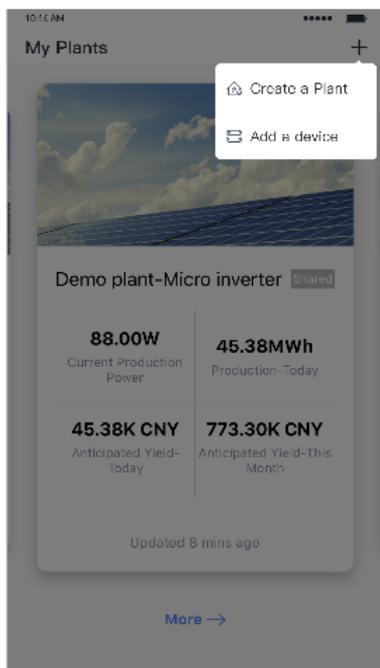
7.4 Network Configuration

After the logger is added, please configure the network to ensure normal operation.

Go to "Plant Details"-"Device List", find the target SN and click "Networking".
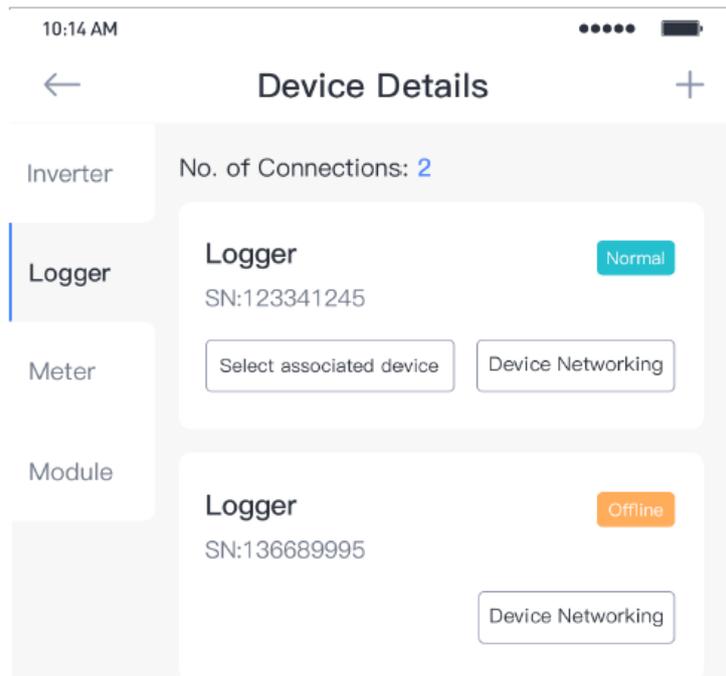
Step 1：Confirm Wi-Fi Info

Please make sure your phone has connected to the right WiFi network. And click "Start".
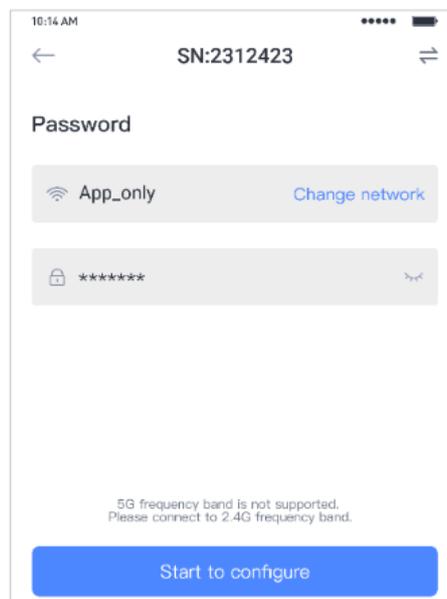
Step 2：Connect to AP network

Click "Go to connect" and find the right "AP_XXXXXXXXXX" network (XXXXXXXXXX refers to logger SN).
The password is required, please input "12345678".
Go back to SOLARMAN Smart APP, after connecting to AP network.
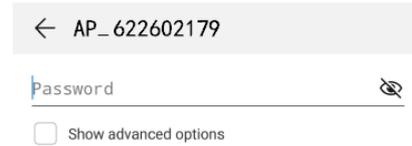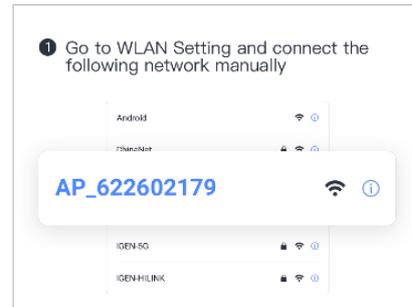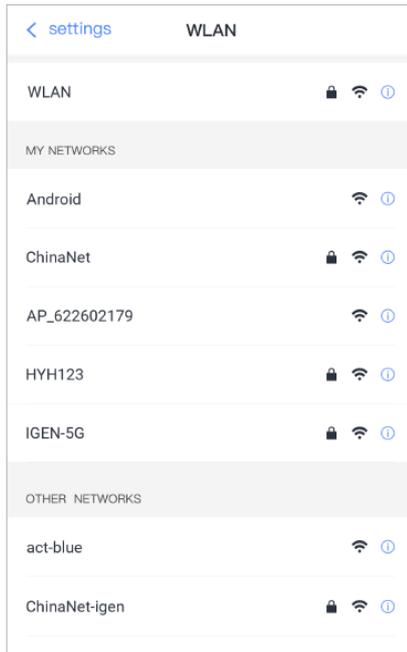
Step 3：Auto Configuration

Please wait for a while to complete the configuration. Then system will switch to the following page.
Click "Done" to check plant data. (Usually, the data will be updated in 10 mins.)
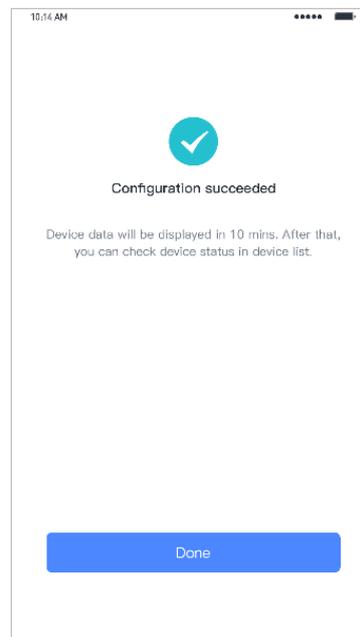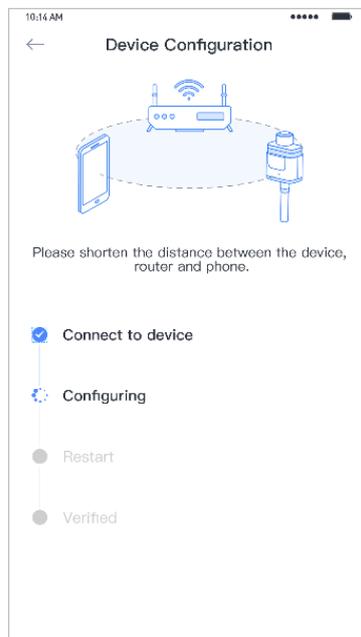
MPMC USA   MPMC UK   MPMC UAE   MPMCZA   MPMC CN

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