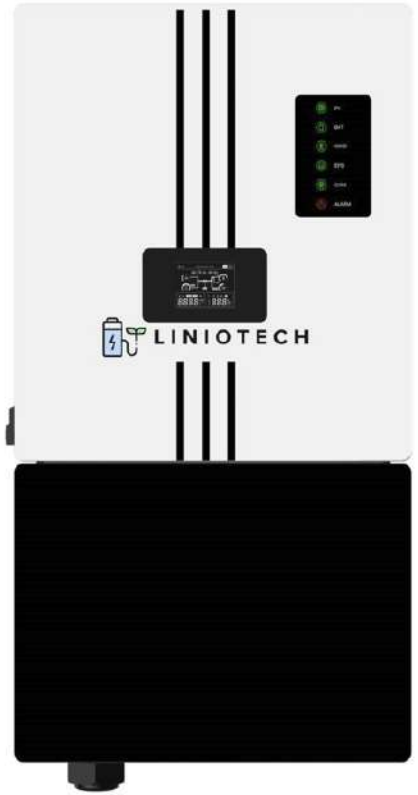
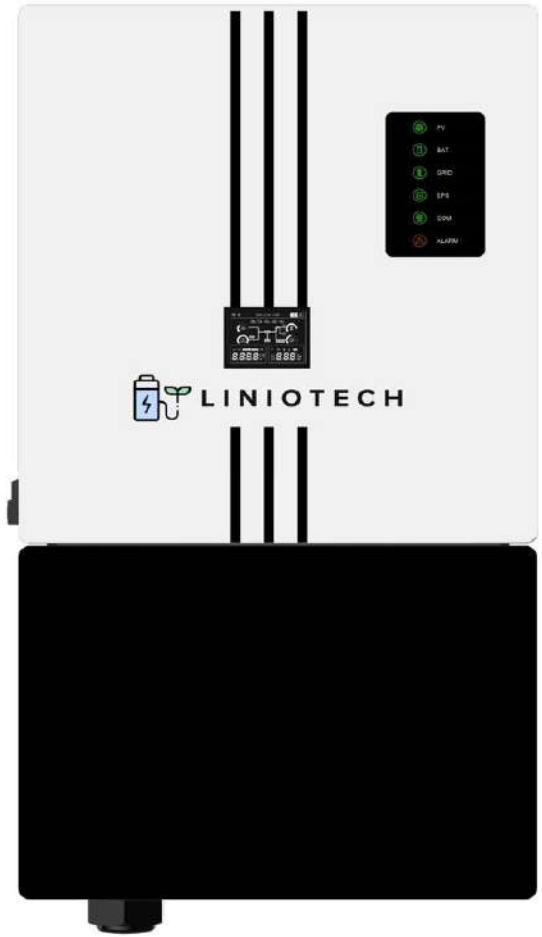
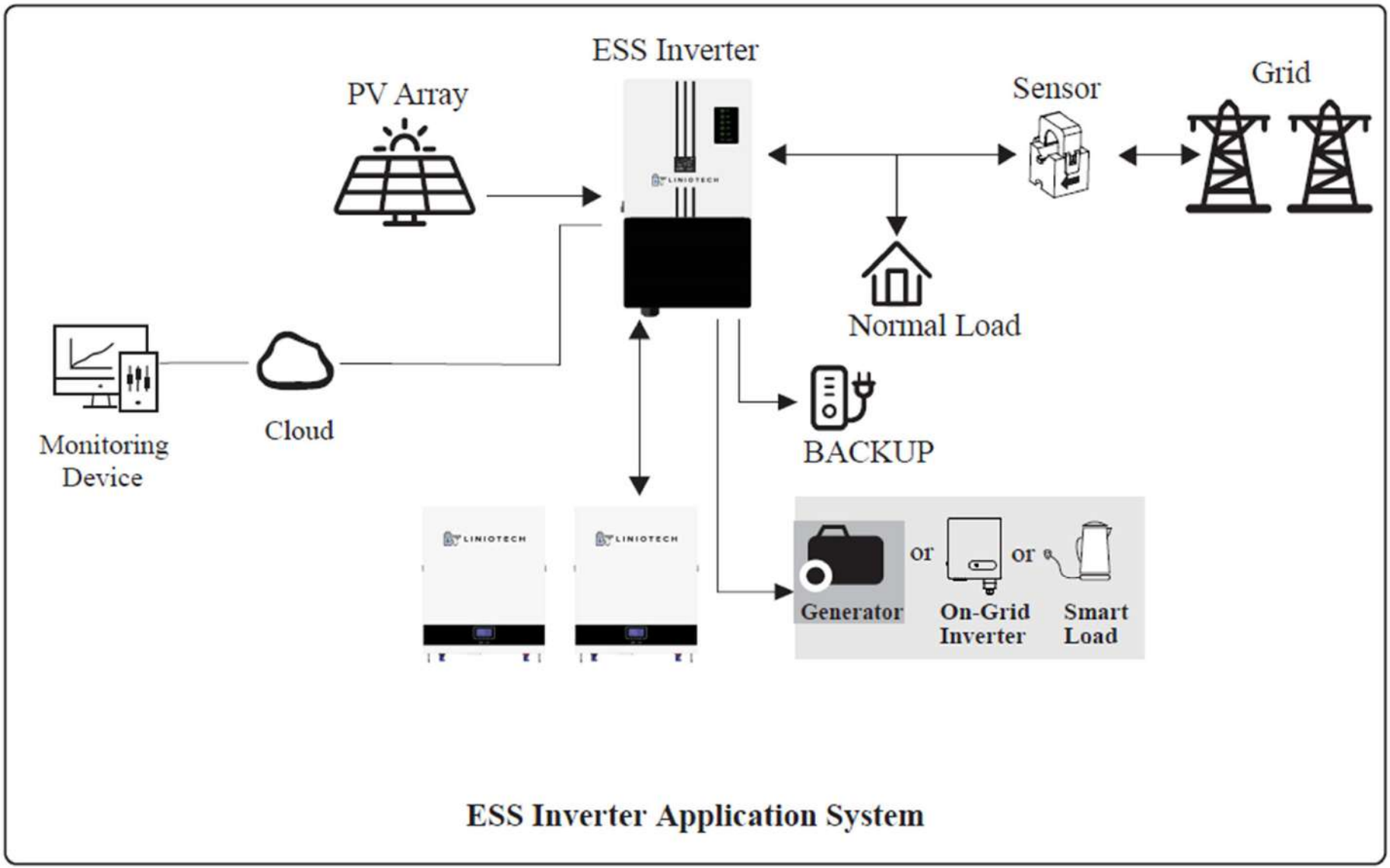
US SOLAR SYSTEM INTRODUCTION





LTN-051200A-B-GBP2



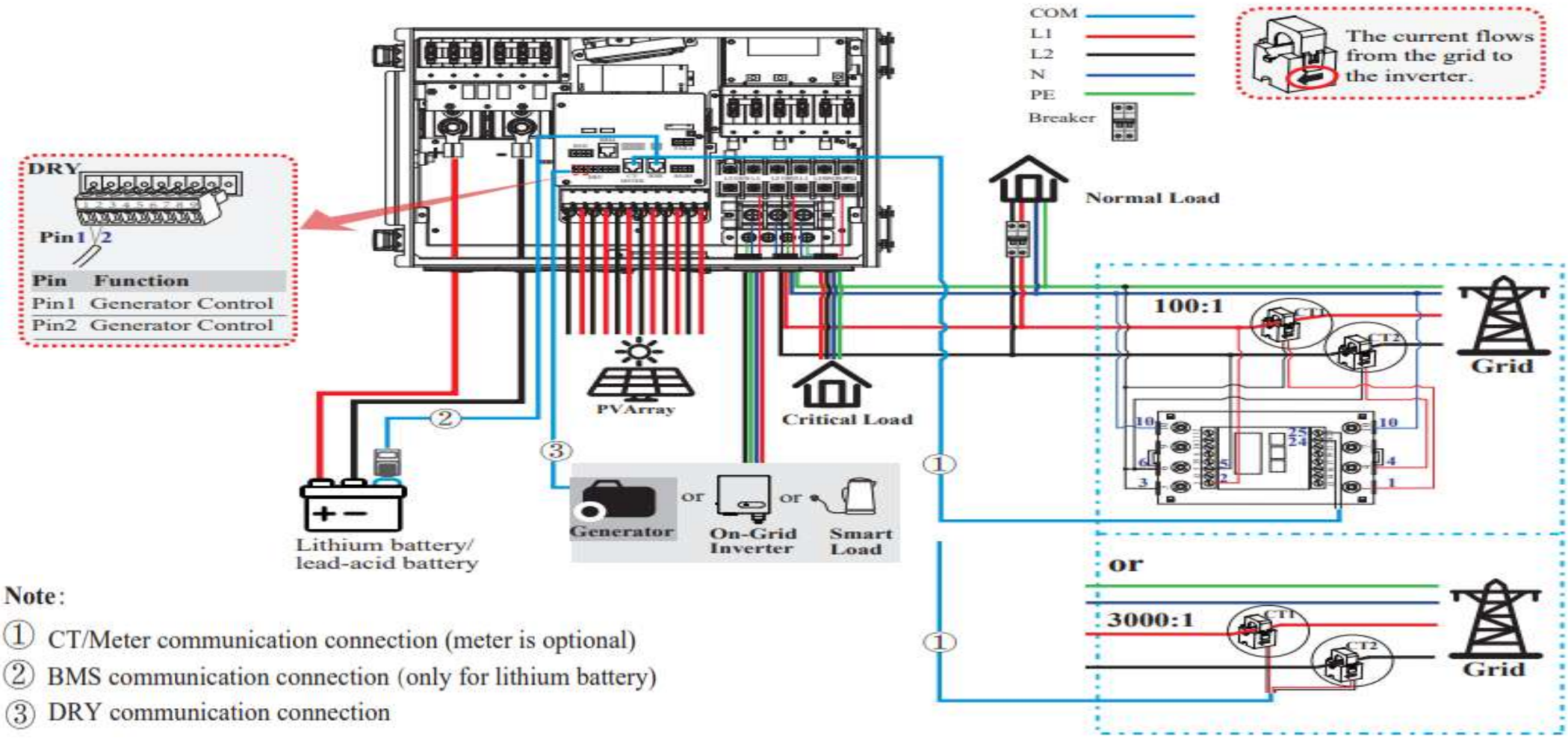
ESS Inverter Application System

4.1 Wiring Diagram

Standard Non-parallel Wiring Diagram

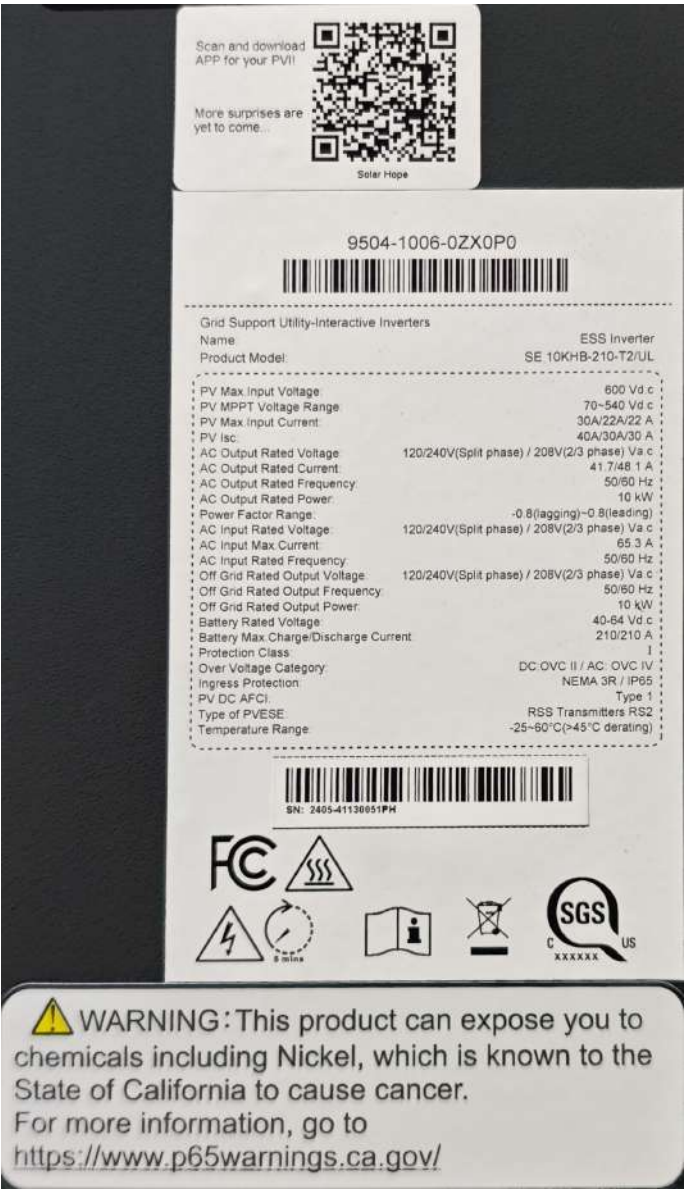
Diagram 01

120/240Vac Split Phase
120/208Vac 2/3 Phase



Note:

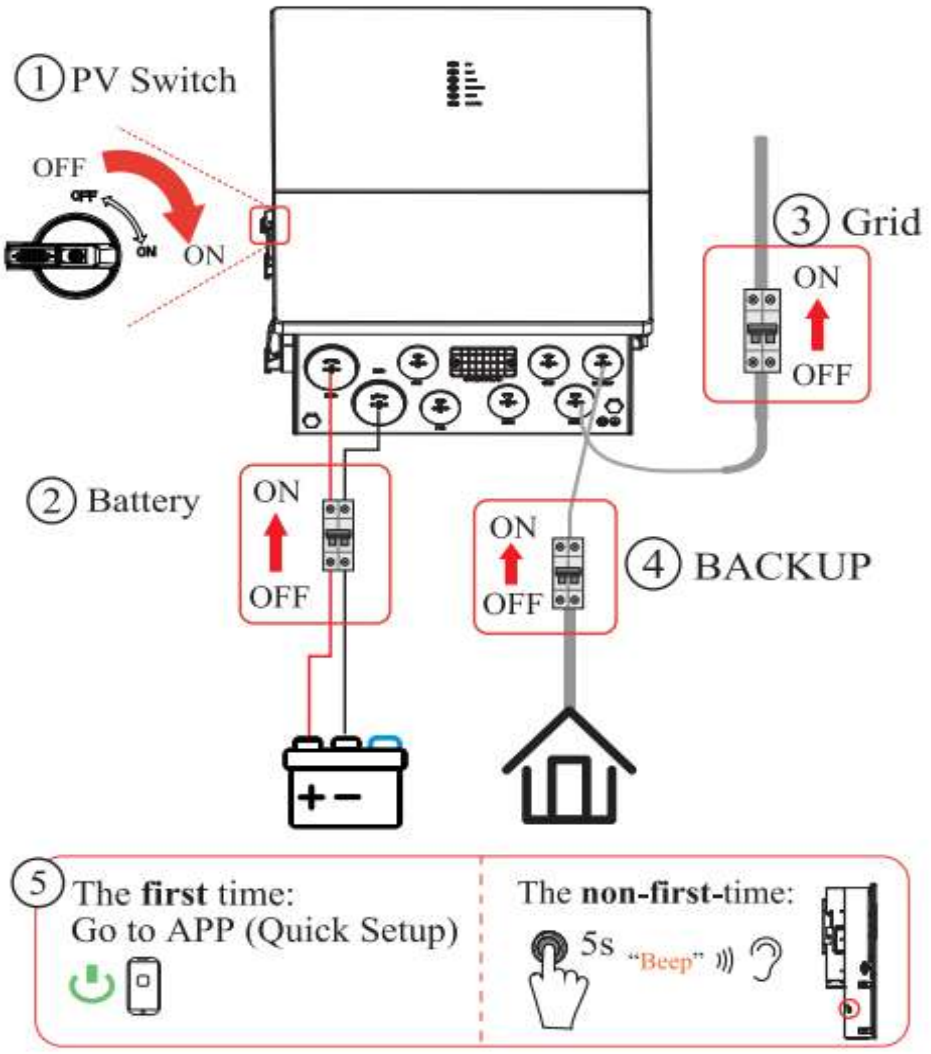
① CT/Meter communication connection (meter is optional)
② BMS communication connection (only for lithium battery)
③ DRY communication connection



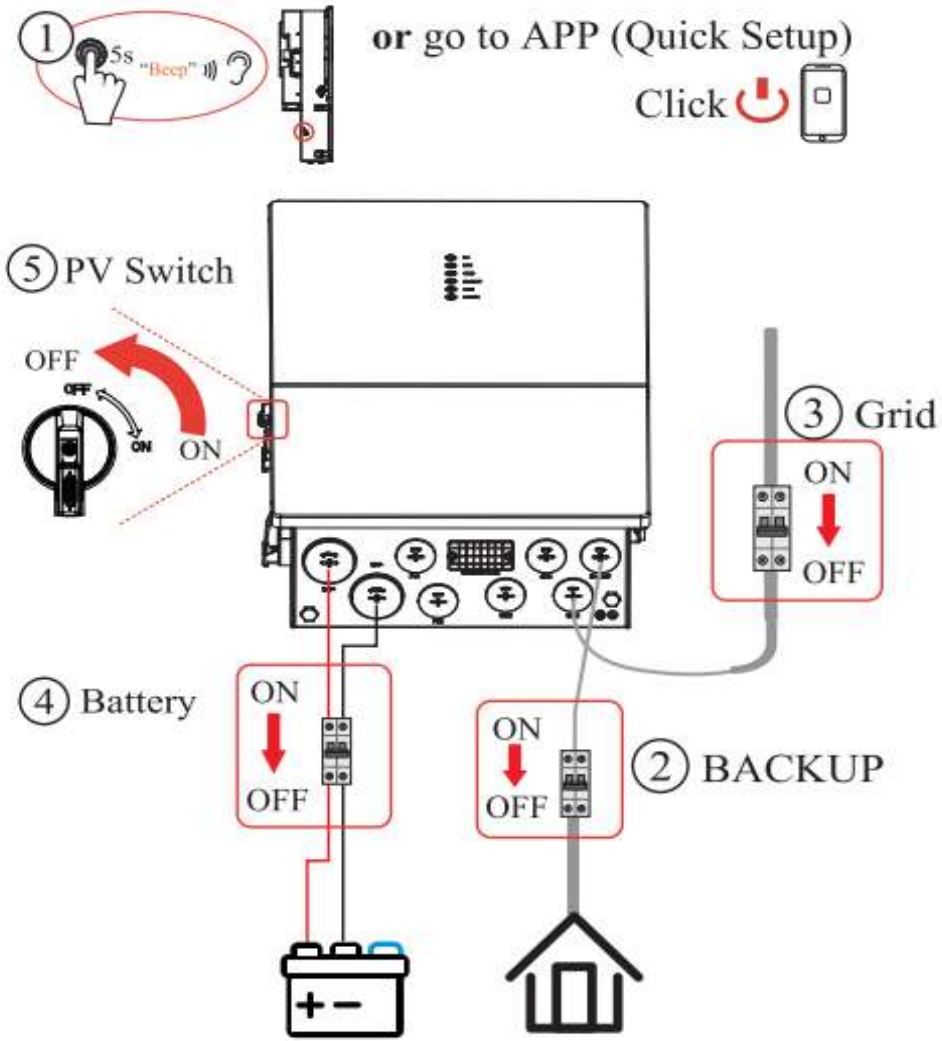
PV Max Input Voltage:	600 Vd c
PV MPPT Voltage Range:	70~540 Vd c
PV Max Input Current:	30A/22A/22 A
PV Isc:	40A/30A/30 A
AC Output Rated Voltage:	120/240V(Split phase) / 208V(2/3 phase) Va c
AC Output Rated Current:	41.7/48.1 A
AC Output Rated Frequency:	50/60 Hz
AC Output Rated Power:	10 kW
Power Factor Range:	-0.8(lagging)~0.8(leading)
AC Input Rated Voltage:	120/240V(Split phase) / 208V(2/3 phase) Va c
AC Input Max Current:	65.3 A
AC Input Rated Frequency:	50/60 Hz
Off Grid Rated Output Voltage:	120/240V(Split phase) / 208V(2/3 phase) Va c
Off Grid Rated Output Frequency:	50/60 Hz
Off Grid Rated Output Power:	10 kW
Battery Rated Voltage:	40-64 Vd c
Battery Max Charge/Discharge Current:	210/210 A

Model	SE 5KHB-130-D2/UL	SE 6KHB-130-D2/UL	SE 7K6HB-180 T2/UL	SE 10KHB-210-T2/UL
Efficiency				
Max. Efficiency (PV to AC)	98.0%			
Max. Efficiency (BAT to AC)	94.5%			
Input (PV)				
Max. PV Input Power	7,500W	9,000W	12,000W	15,000W
Max. PV Voltage	600V			
Start-up Voltage	90V			
MPPT Operating Voltage Range	70V-540V			
Max. Input Current per MPPT	30A/22A		30A/22A/22A	
Max short current per MPPT	40A/30A		40A/30A/30A	
String per MPPT	4 (2/2)		6 (2/2/2)	
Nos. of MPPT	2		3	
Input/Output (BAT)				
Battery Type	Lithium-ion/Lead-acid			
Nominal Battery Voltage	48V			
Battery Voltage Range	40V-64V			
Max. Charge/Discharge Current	210A/130A	210A/130A	210A/180A	210A/210A
Max. Charge/Discharge Power	10,000W/5,000W	10,000W/6,000W	10,000W/7,600W	11,400W/11,400W
Output (Grid)				
Nominal AC Output Power	5,000W	6,000W	7,600W	10,000W
Max. AC Output Apparent Power	5,500VA	6,600VA	7,600VA	11,400VA
Max. AC Output Power (PF=1)	5,500W	6,600W	7,600W	11,400W
Nominal AC Output Current	20.9A/24.1A	25A/28.9A	31.7A/36.6A	41.7A/47.5A
Max. AC Output Current	26.5A	31.8A	40.4A	47.5A
Nominal Grid Voltage	120V/240V (Split phase) / 208V (2/3 phase)			
Nominal Grid Frequency	50Hz /60Hz			
Grid Frequency Range	45Hz-55Hz/55Hz-65Hz (Adjustable)			
Power Factor	> 0.99 @rated power (Adjustable 0.8 LD - 0.8 LG)			
THDI	<3% (Rated Power)			
Output (Back up)				
Nominal Output Power	5,000W	6,000W	7,600W	10,000W
Nominal Output Current	20.9A/24.1A	25A/28.9A	31.7A/36.6A	41.7A/47.5A
Peak Output Apparent Power (1s)	10,000VA	12,000VA	15,200VA	20,000VA
Nominal Output Voltage	120V/240V (Split phase) / 208V (2/3 phase)			
Nominal Output Frequency	50Hz/60Hz			
Transfer Time	<10ms			
THDV	<3% @100% R Load			

Startup Procedure



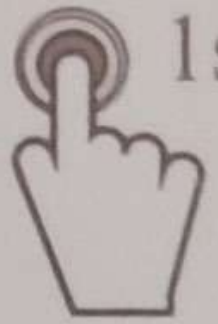
Shutdown Procedure



- ON/OFF (5s)

"Beep"

- Clear the overload alarm (1s)
- Light up the LCD (1s)*



*This function is available only in the LCD version.

16 Quick Setup

SolarHope
工具

AsianPowerDevicesInc　　工具

A Preparation

1. Download the App *SolarHope* for local settings.
   - Scan the QR code on the inverter to download the App.
   - Download the App from the App Store or Google Play.

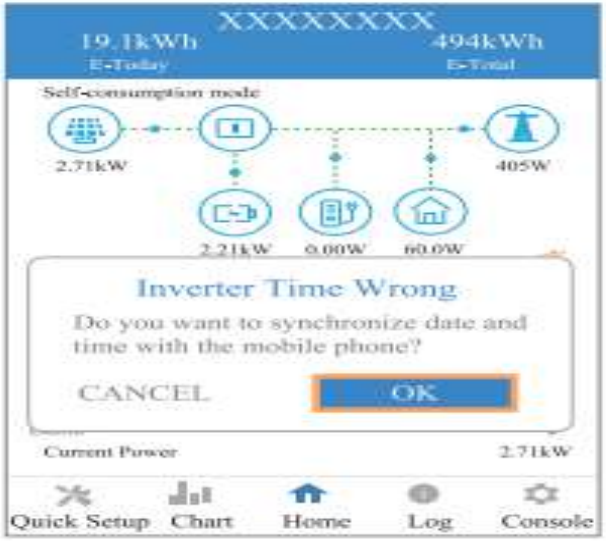
NOTE

1. The App *SolarHope* is only for local settings.
Detailed information about remote monitoring, please refer to corresponding WIFI User Manual.
2. The App should access some permissions such as the device's location. You need to grant all access rights in all pop-up windows when installing the App or setting your phone.

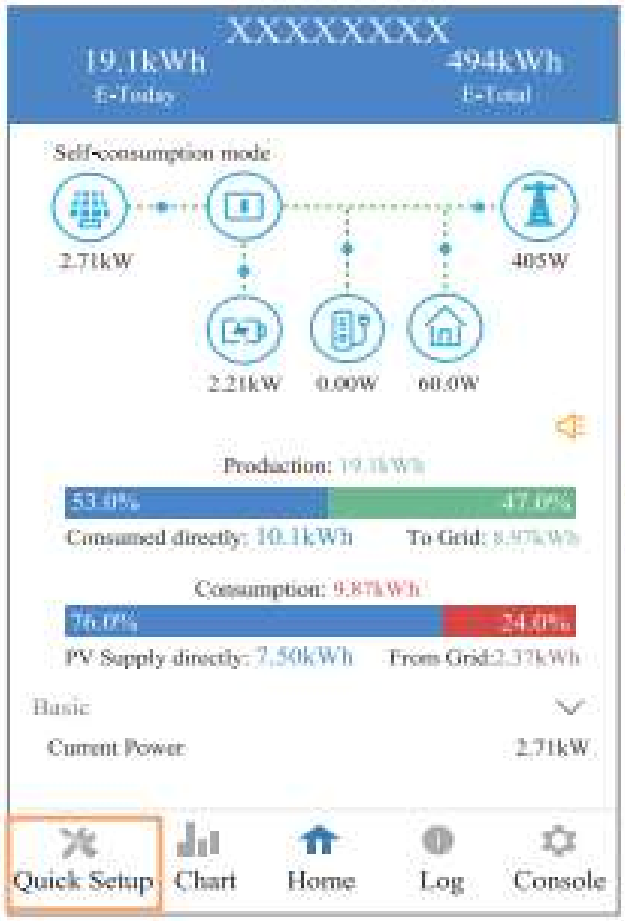
2. Power on the inverter.

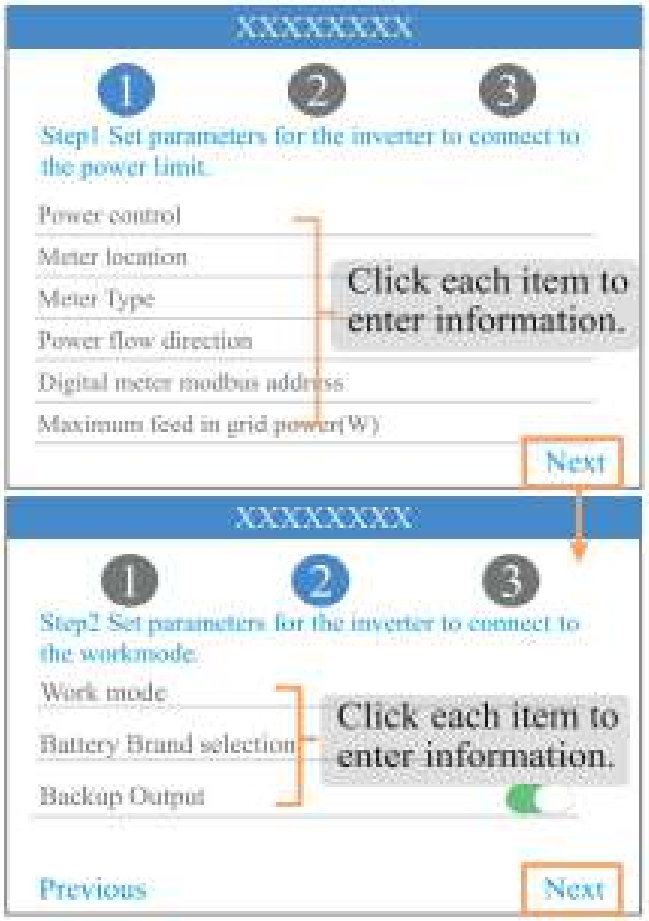
B Connecting the Inverter

1. Enable the Bluetooth on your phone and open the APP.
2. Follow the instructions below.



C Quick Setup





- For details about the LED panel, please refer to the *User Manual*.

1. PV
2. BATTERY
3. GRID
4. LOAD 1 &LOAD 2
5. HOME LOAD
6. GENERATOR

PV Connection

This section explains the requirements and procedures of PV connection. Read carefully before connecting.

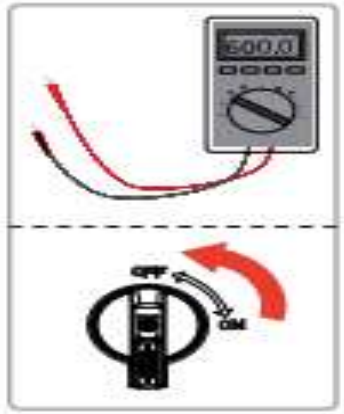
⚠ **DANGER**	1.Photovoltaic arrays exposed to sunlight will generate dangerous voltages! 2.Before connecting the PV terminal, ensure that both the AC terminal and the DC terminal are powered off and the PV switch is OFF. Otherwise there is a risk of high voltage shock.

Step1. Prepare the proper cable we recommended, and strip approx. 15 mm of the cable insulation.

It is recommended to use dedicated PV cable.

Step2. Inspection before connection.

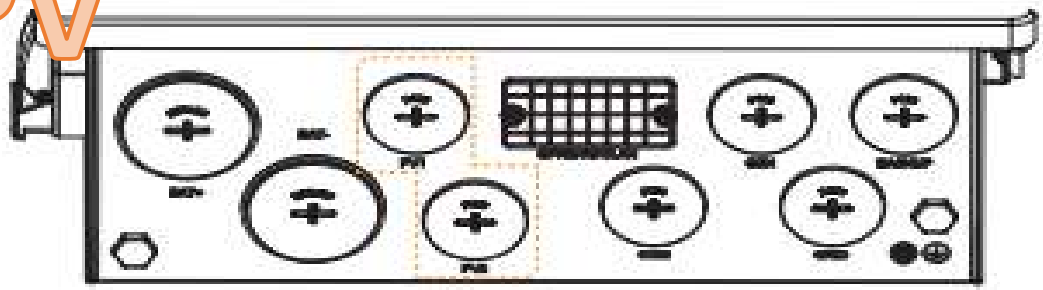
- Check correct polarity of wire connection from PV modules and PV input connectors.
- The test voltage cannot exceed 600V.
- Ensure that the PV switch is OFF.

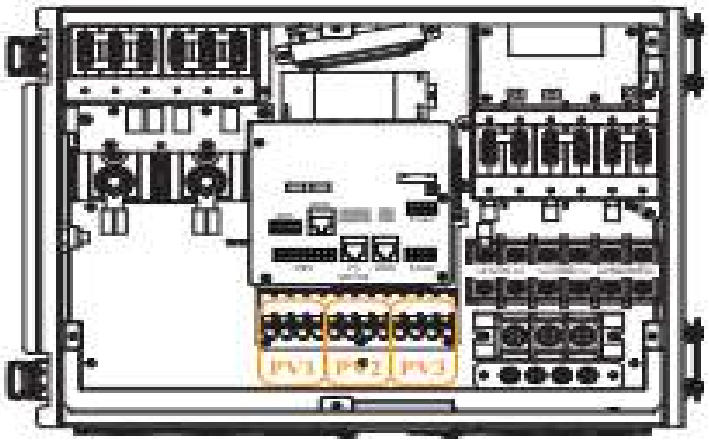


PV

Step3. Thread the wires into wire box through PV connection ports.

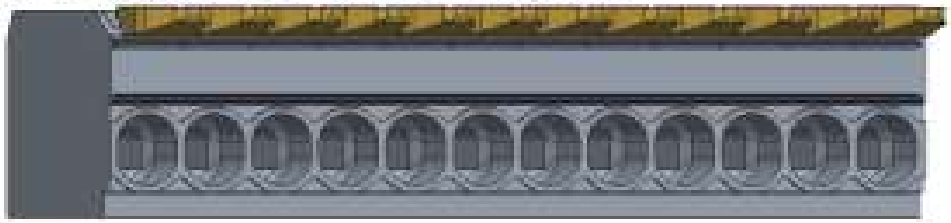
PV

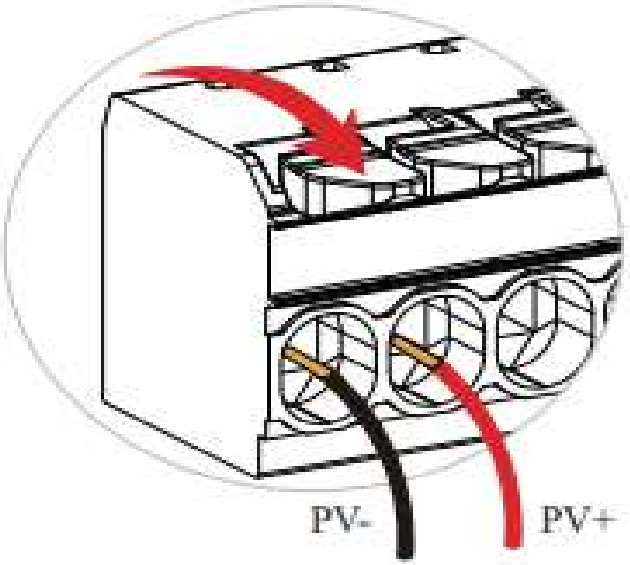


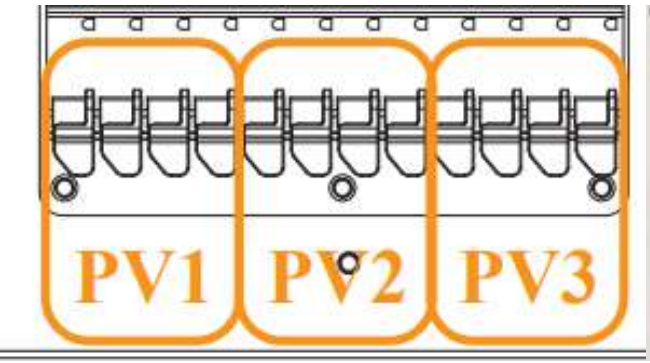


Step4. Open the switches of PV input connector.
Insert the stripped cable into the PV input connector.
When doing so, ensure that the stripped cable and the PV input connector are of the same polarity.
Finally, close switches and ensure the wires are tightly fixed.

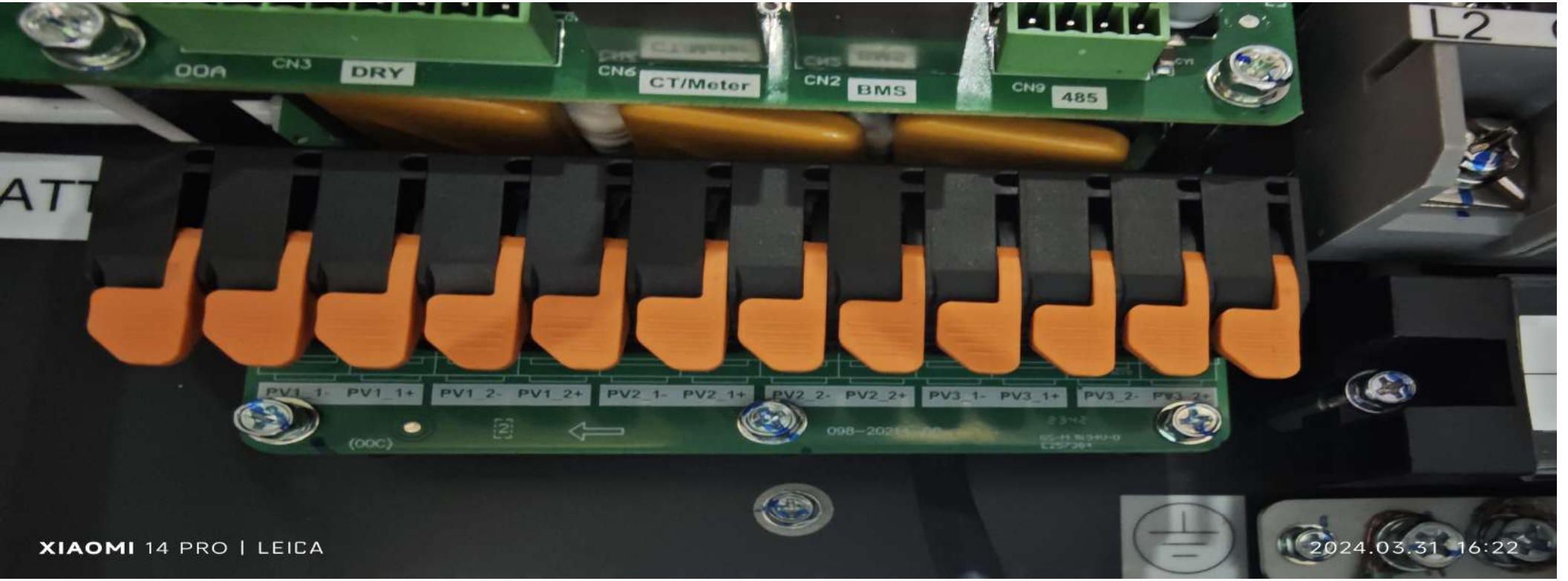
Side view of PV input connector:







PV Max.Input Voltage:	600 Vd.c
PV MPPT Voltage Range:	70~540 Vd.c
PV Max.Input Current:	30A/22A/22 A
PV Isc:	40A/30A/30 A



Model	SE 5KHB-130-D2/UL	SE 6KHB-130-D2/UL	SE 7K6HB-180 T2/UL	SE 10KHB-210-T2/UL
Efficiency				
Max. Efficiency (PV to AC)	98.0%			
Max. Efficiency (BAT to AC)	94.5%			
Input (PV)				
Max. PV Input Power	7,500W	9,000W	12,000W	15,000W
Max. PV Voltage	600V			
Start-up Voltage	90V			
MPPT Operating Voltage Range	70V-540V			
Max. Input Current per MPPT	30A/22A		30A/22A/22A	
Max short current per MPPT	40A/30A		40A/30A/30A	
String per MPPT	4 (2/2)		6 (2/2/2)	
Nos. of MPPT	2		3	

How to calculate PV

For example:
Each Solar panel dates: 500W, 40V, 13A
8kw Inverter's PV design idea:
Max solar panels numbers: 15KW=15,000W /550W=27 PCS
Max solar panels numbers each mppt: 540V/40V=13 PCS
Min solar panels numbers each mppt: 90V/40V=3 PCS

Idear 1:

MPPT1-PV1- 1----13 PCS in series MPPT2-PV2- 1 ----14 PCS in series

PV

MPPT1				MPPT2				MPPT3			
PV1		PV1		PV2		PV2		PV3		PV3	
1-	1+	2-	2+	1-	1+	2-	2+	1-	1+	2-	2+

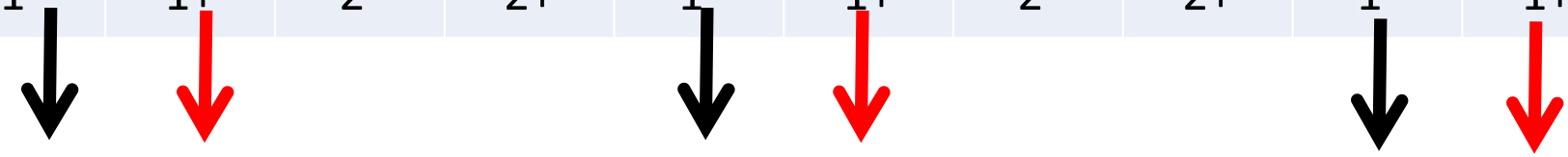
OR MPPT2-1----13 PCS in series MPPT3-PV3- 1 ---- 14 PCS in series

MPPT1				MPPT2				MPPT3			
PV1		PV1		PV2		PV2		PV3		PV3	
1-	1+	2-	2+	1-	1+	2-	2+	1-	1+	2-	2+

Idear 2:
PV 1----9 PCS in series
PV 2----9 PCS in series
PV 3----9 PCS in series

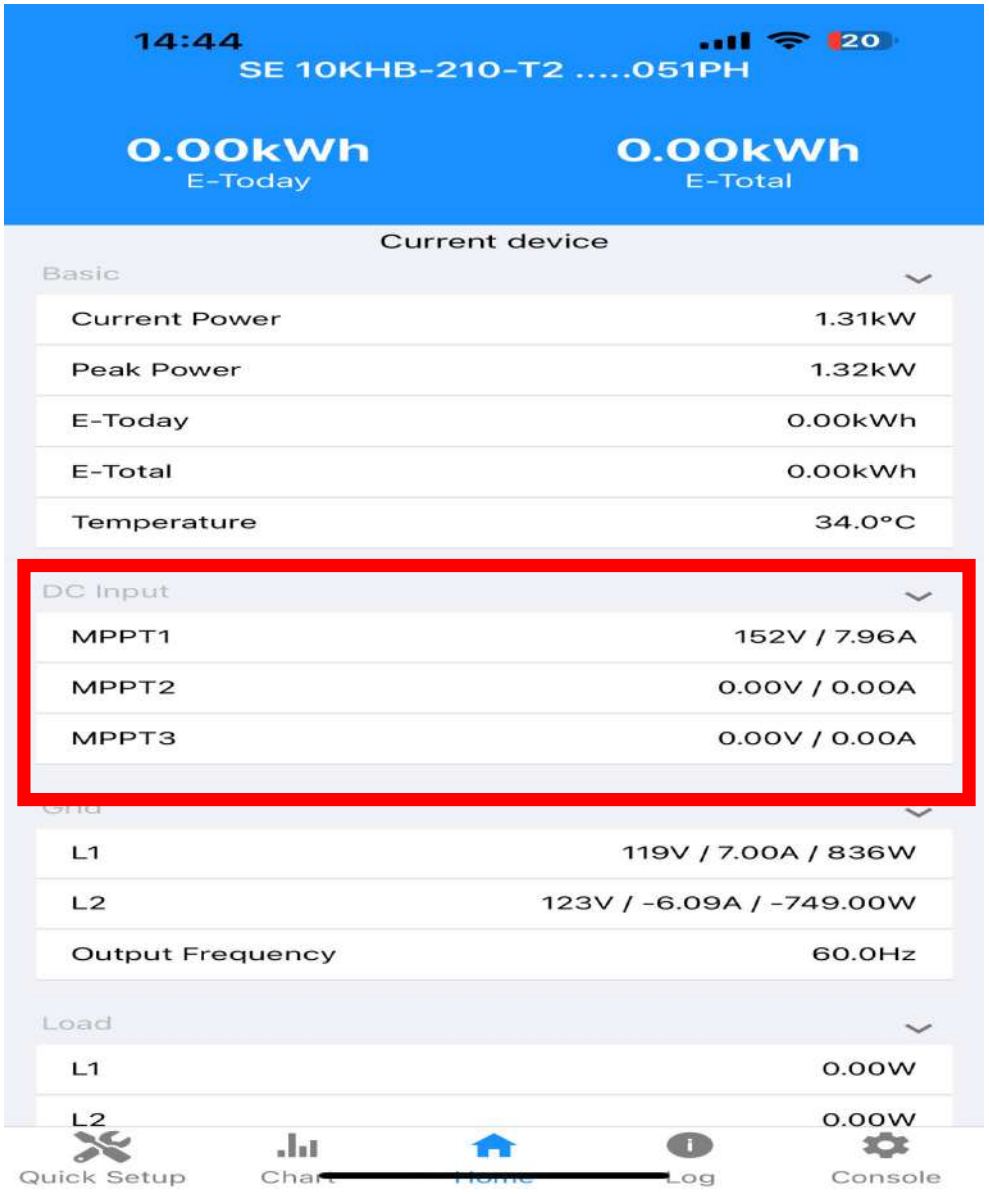
PV

MPPT1				MPPT2				MPPT3			
PV1		PV1		PV2		PV2		PV3		PV3	
1-	1+	2-	2+	1-	1+	2-	2+	1-	1+	2-	2+



PV

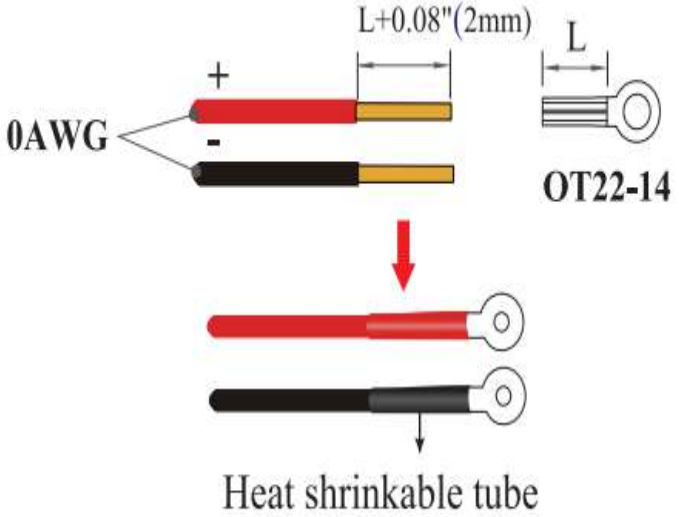
PV INFORMATION



Battery Connection

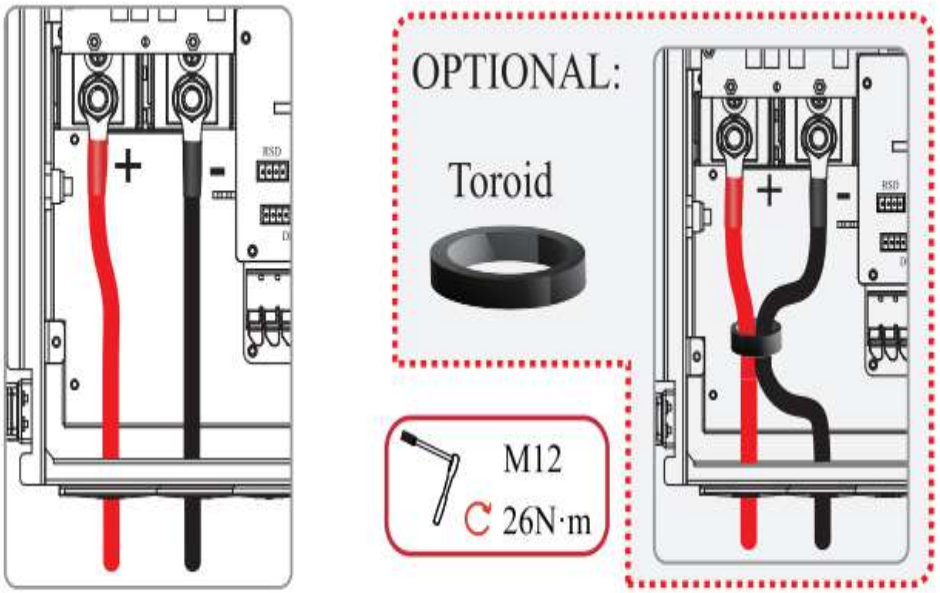
BATTERY

Before connecting the battery terminal, ensure that both the AC terminal and the DC terminal are powered off and the PV switch is OFF. Otherwise there is a risk of high voltage shock.



It is recommended that the battery cable be less than or equal to 3 m.

1 Wires making.



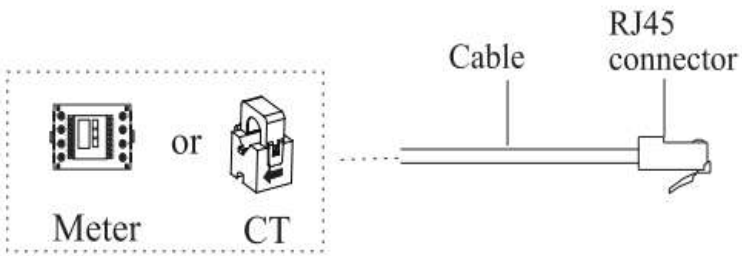
Warning!
Reverse polarity will damage the inverter!

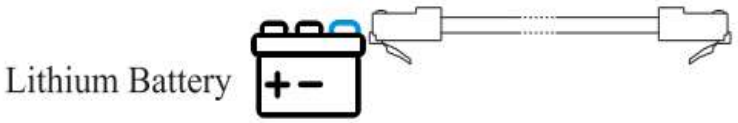
2 Wires connection.

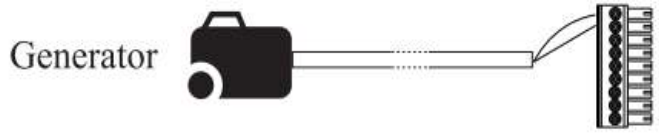
Communication Cable(s) Connection (CT/Meter, BMS, DRY)

BATTERY

*The inverter is not equipped with RJ45 connectors.







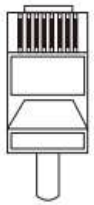
Inverter side

Meter or **CT**

RJ45	Meter
Pin3 (RS485_A)	Pin24
Pin4 (RS485_B)	Pin25

RJ45	CT
Pin5 (CT2-)	Black
Pin6 (CT2+)	Red
Pin7 (CT1+)	Red
Pin8 (CT1-)	Black

BMS

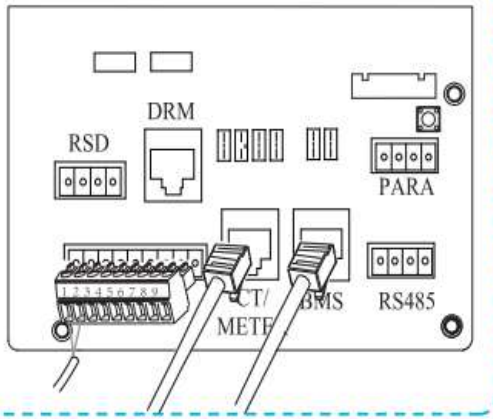


Pin1: RS485_A
Pin2: RS485_B
Pin3: /
Pin4: CAN_H
Pin5: CAN_L
Pin6: /
Pin7: /
Pin8: /

DRY

Pin1 Generator Control
Pin2 Generator Control

Panel at inverter side:

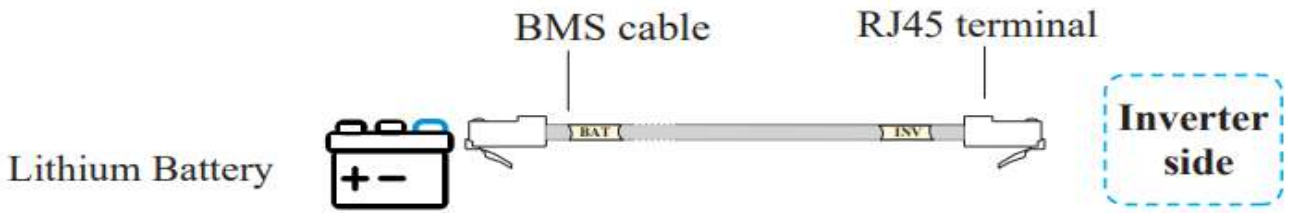


- Assemble the communication cables with an RJ45 connector/9-Pin terminal according to each Pin definition.
- Insert these cables into corresponding communication ports according to panel at inverter side.

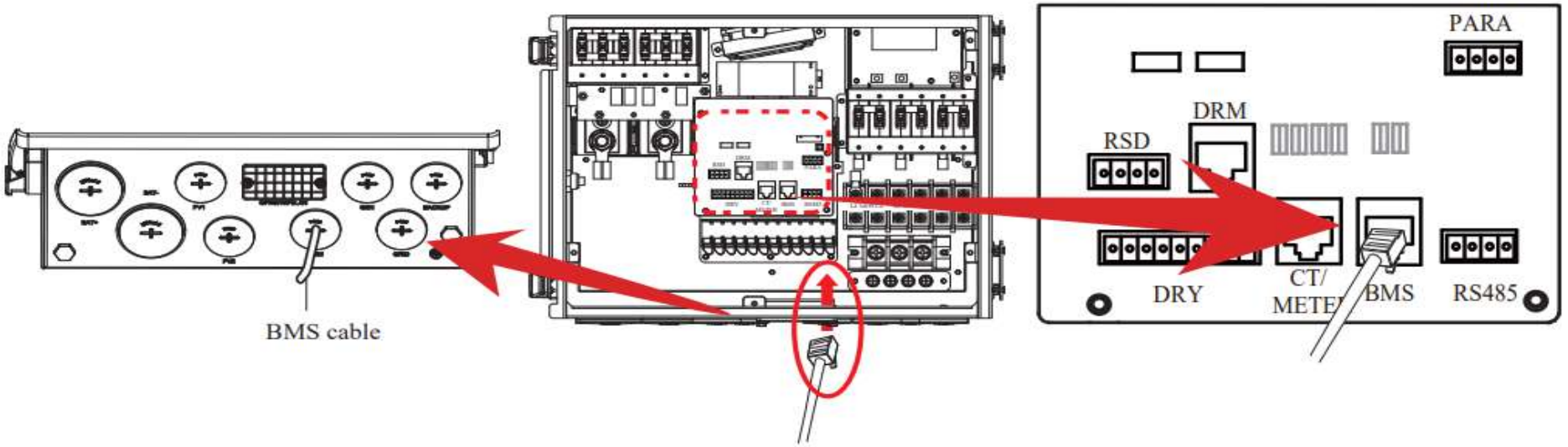
- **BMS communication cable connection steps:**

BATTERY

a. Lead the BMS cable through the COM port.

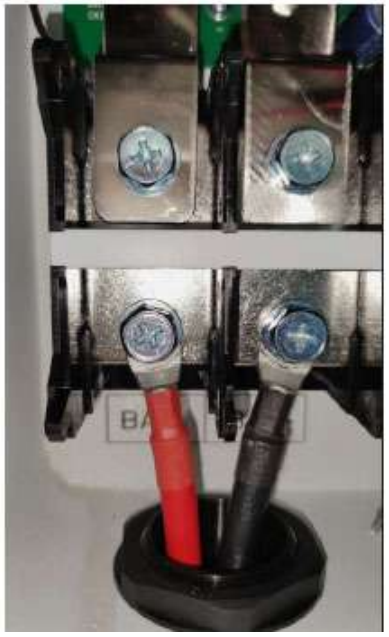


b. Insert the RJ45 terminal into BMS port.

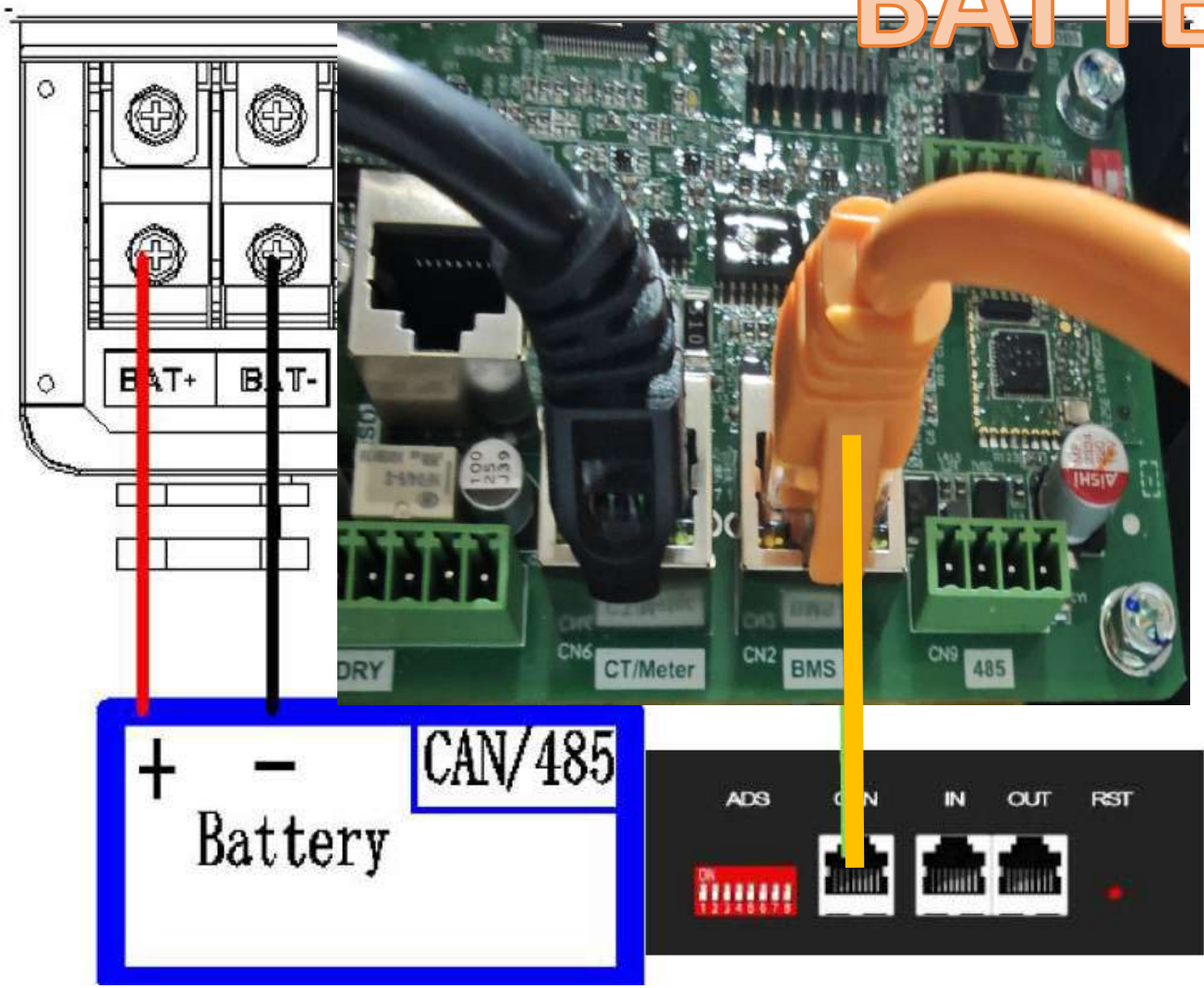


Battery connection diagram

SPLIT PHASE INVERTER



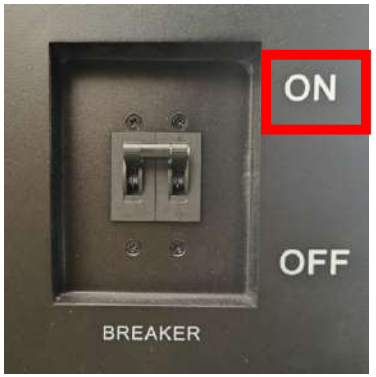
BATTERY



IMPORTANT NOTES FOR UL BATTERY:

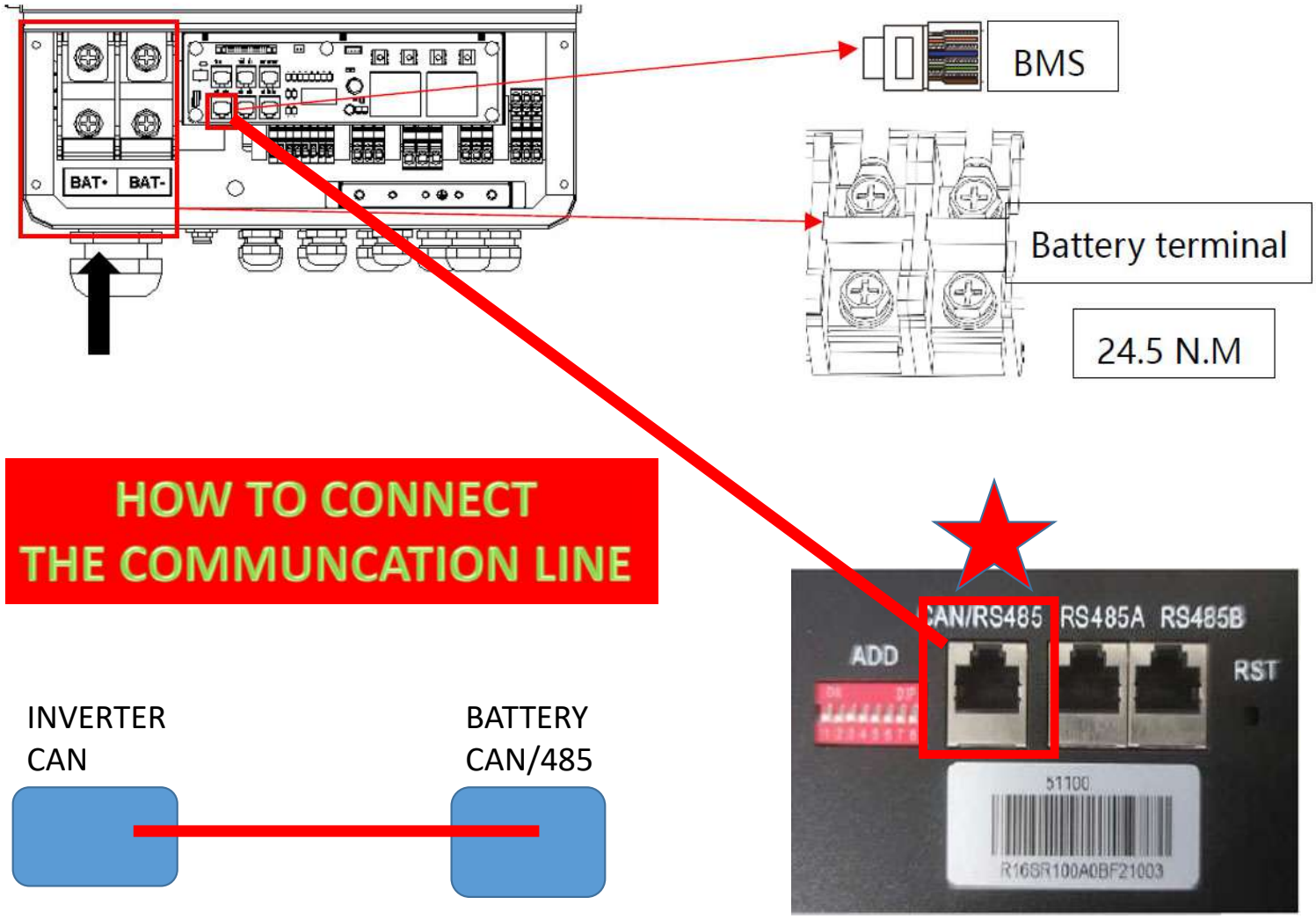
How to turn on battery

To TURN ON the UL battery, please make sure to turn on the side breaker first and then turn on the ON/OFF button on the battery.



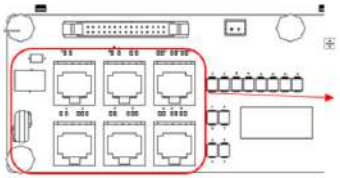
To TURN OFF the UL battery, please make sure to turn off the ON/OFF button on the battery first and then to turn off the side breaker.

How to connect the comm line(battery&inverter)



1 unit inverter and 3 units batteries:

Inverter CAN



TYPE-C UPDATE	CAN1	CAN2	RS485
	BMS-485 BMS-CAN	CT L2	CT L1

· CAN1/CAN2: Communication interface for connecting inverters.

2 units inverters and 3 units batteries:

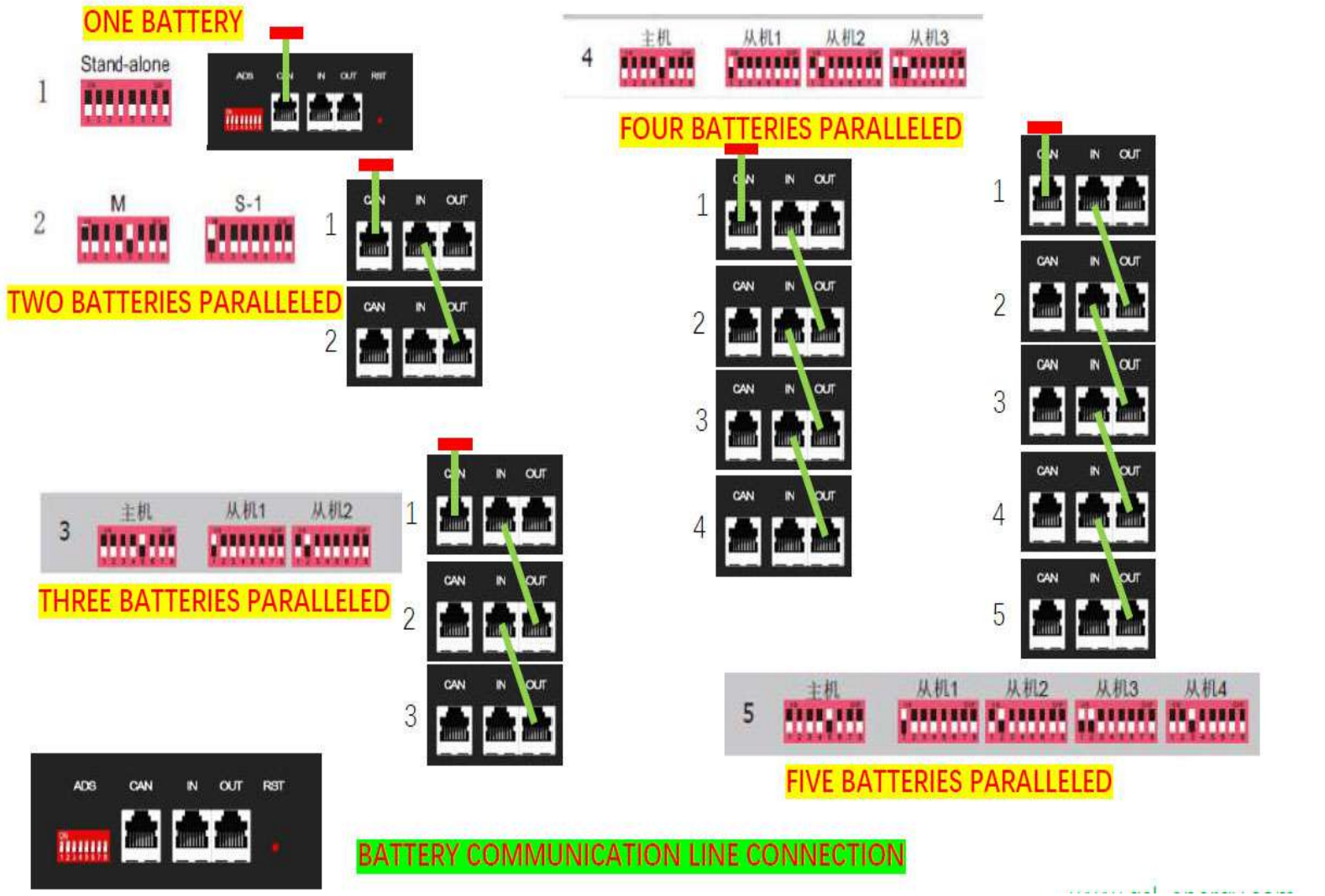
Master Inverter CAN

CAN1

Slave Inverter CAN

CAN2

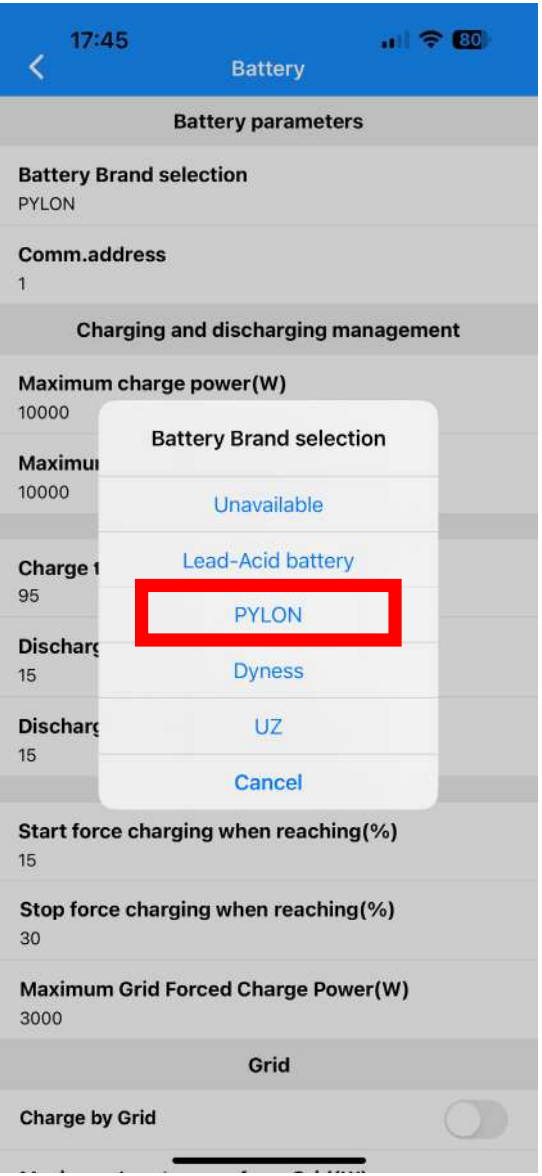
HOW TO PARALLEL THE BATTERIES. MAX 16 units

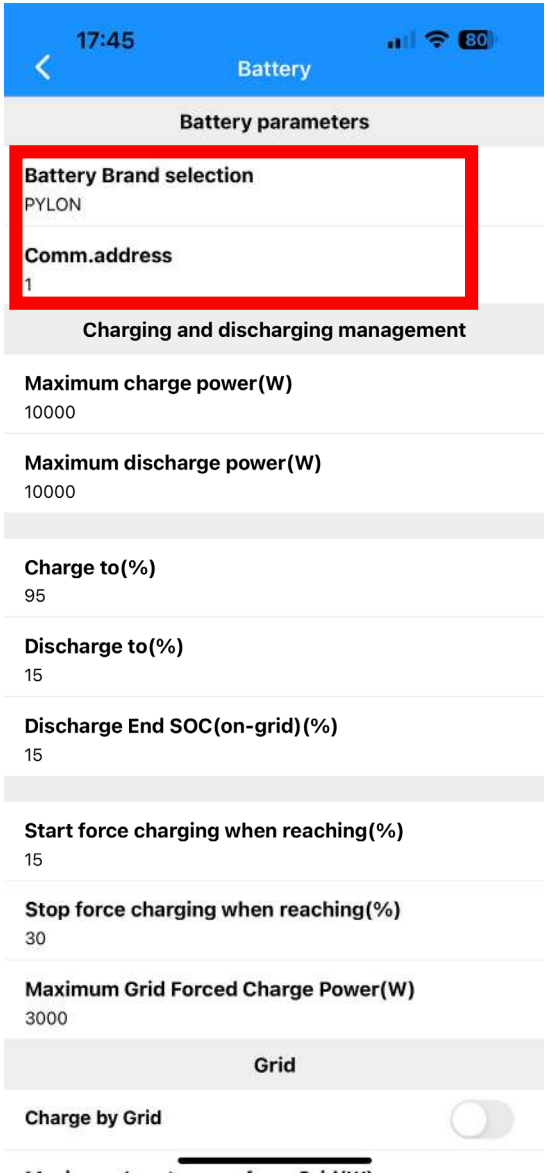


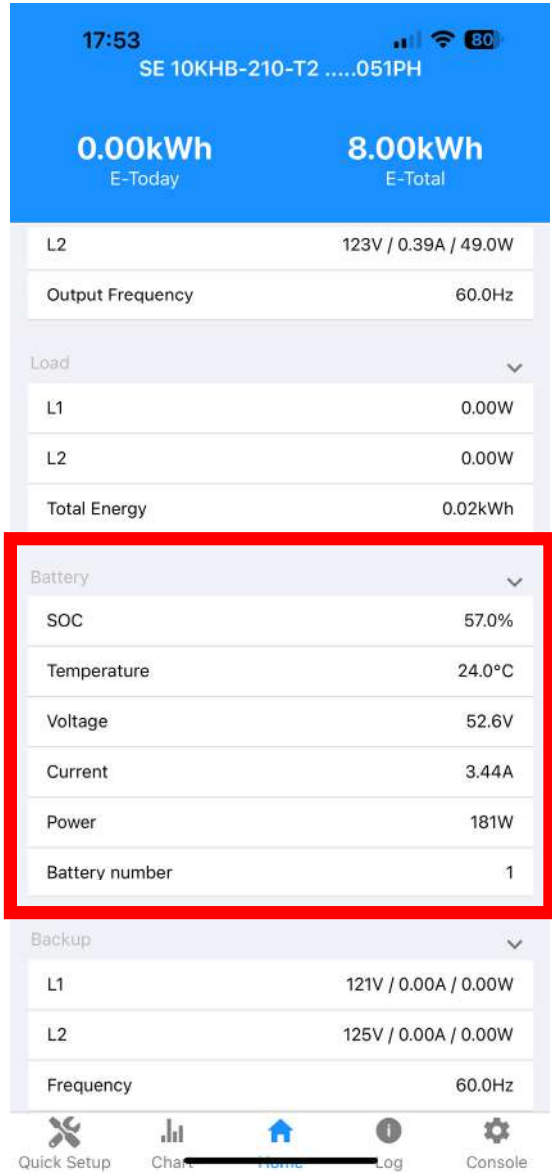
HOW TO PARALLEL THE BATTERIES. MAX 16 units

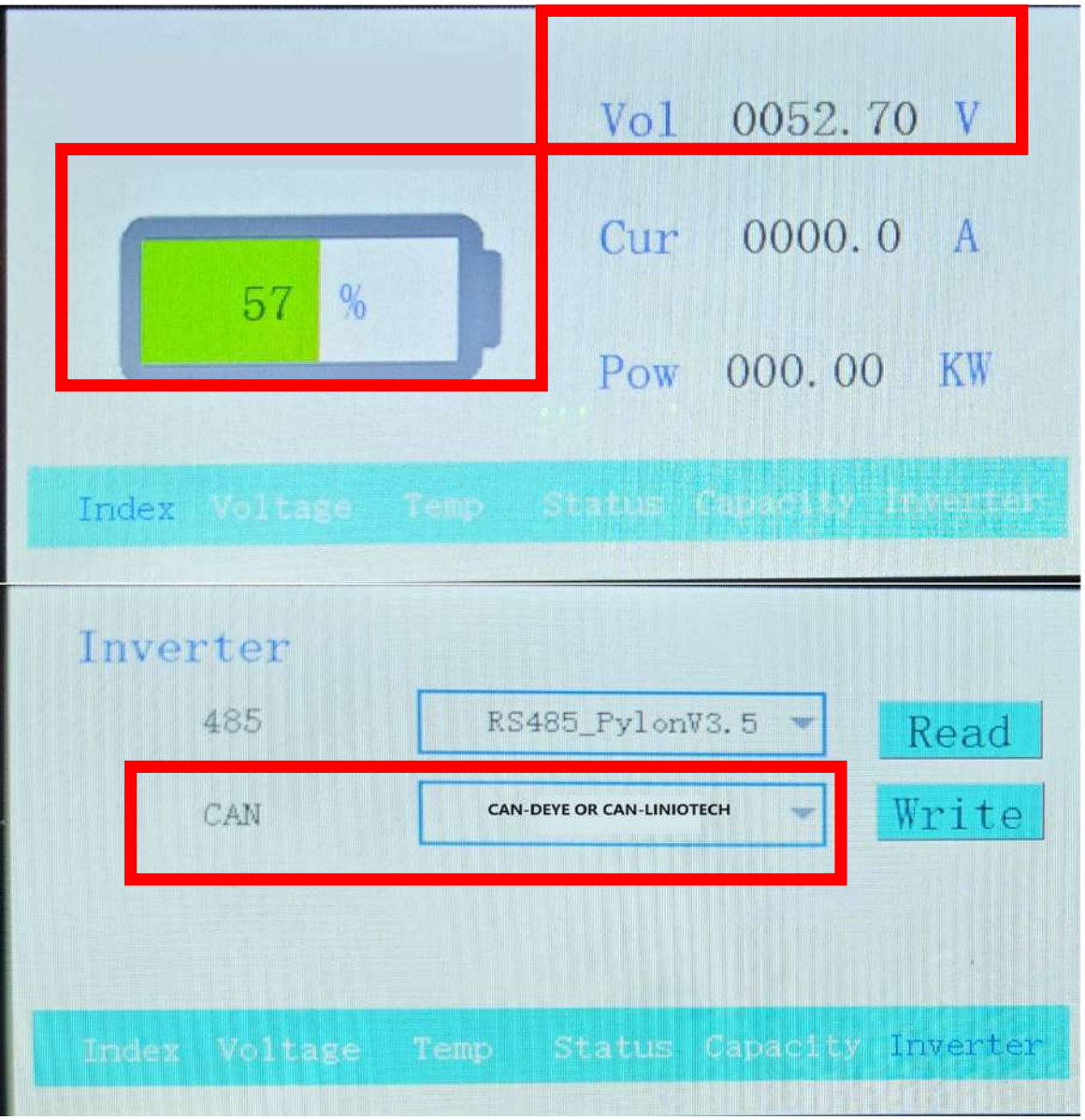
2022 51200/51100/48100

1	单机使用															
2	主机	从机1														
3	主机	从机1	从机2													
4	主机	从机1	从机2	从机3												
5	主机	从机1	从机2	从机3	从机4											
6	主机	从机1	从机2	从机3	从机4	从机5										
7	主机	从机1	从机2	从机3	从机4	从机5	从机6									
8	主机	从机1	从机2	从机3	从机4	从机5	从机6	从机7								
9	主机	从机1	从机2	从机3	从机4	从机5	从机6	从机7	从机8							
10	主机	从机1	从机2	从机3	从机4	从机5	从机6	从机7	从机8	从机9						
11	主机	从机1	从机2	从机3	从机4	从机5	从机6	从机7	从机8	从机9	从机10					
12	主机	从机1	从机2	从机3	从机4	从机5	从机6	从机7	从机8	从机9	从机10	从机11				
13	主机	从机1	从机2	从机3	从机4	从机5	从机6	从机7	从机8	从机9	从机10	从机11	从机12			
14	主机	从机1	从机2	从机3	从机4	从机5	从机6	从机7	从机8	从机9	从机10	从机11	从机12	从机13		
15	主机	从机1	从机2	从机3	从机4	从机5	从机6	从机7	从机8	从机9	从机10	从机11	从机12	从机13	从机14	
16	主机	从机1	从机2	从机3	从机4	从机5	从机6	从机7	从机8	从机9	从机10	从机11	从机12	从机13	从机14	从机15


17:45
Battery
Battery parameters
Battery Brand selection
PYLON
Comm.address
1
Charging and discharging management
Maximum charge power(W)
10000
Maximu
10000
Charge t
95
Dischar
15
Dischar
15
Start force charging when reaching(%)
15
Stop force charging when reaching(%)
30
Maximum Grid Forced Charge Power(W)
3000
Grid
Charge by Grid
Battery Brand selection
Unavailable
Lead-Acid battery
PYLON
Dyness
UZ
Cancel


17:45
Battery
Battery parameters
Battery Brand selection
PYLON
Comm.address
1
Charging and discharging management
Maximum charge power(W)
10000
Maximum discharge power(W)
10000
Charge to(%)
95
Discharge to(%)
15
Discharge End SOC(on-grid)(%)
15
Start force charging when reaching(%)
15
Stop force charging when reaching(%)
30
Maximum Grid Forced Charge Power(W)
3000
Grid
Charge by Grid


17:53
SE 10KHB-210-T2 .....051PH
0.00kWh
E-Today
8.00kWh
E-Total
L2
123V / 0.39A / 49.0W
Output Frequency
60.0Hz
Load
L1
0.00W
L2
0.00W
Total Energy
0.02kWh
Battery
SOC
57.0%
Temperature
24.0°C
Voltage
52.6V
Current
3.44A
Power
181W
Battery number
1
Backup
L1
121V / 0.00A / 0.00W
L2
125V / 0.00A / 0.00W
Frequency
60.0Hz
Quick Setup
Log
Console


Vol 0052.70 V
57 %
Cur 0000.0 A
Pow 000.00 KW
Index Voltage Temp Status Capacity Inverter
Inverter
485
RS485_PylonV3.5
Read
CAN
CAN-DEYE OR CAN-LINIOTECH
Write
Index Voltage Temp Status Capacity Inverter


PV
BAT
GRID
BACKUP
COM
ALARM

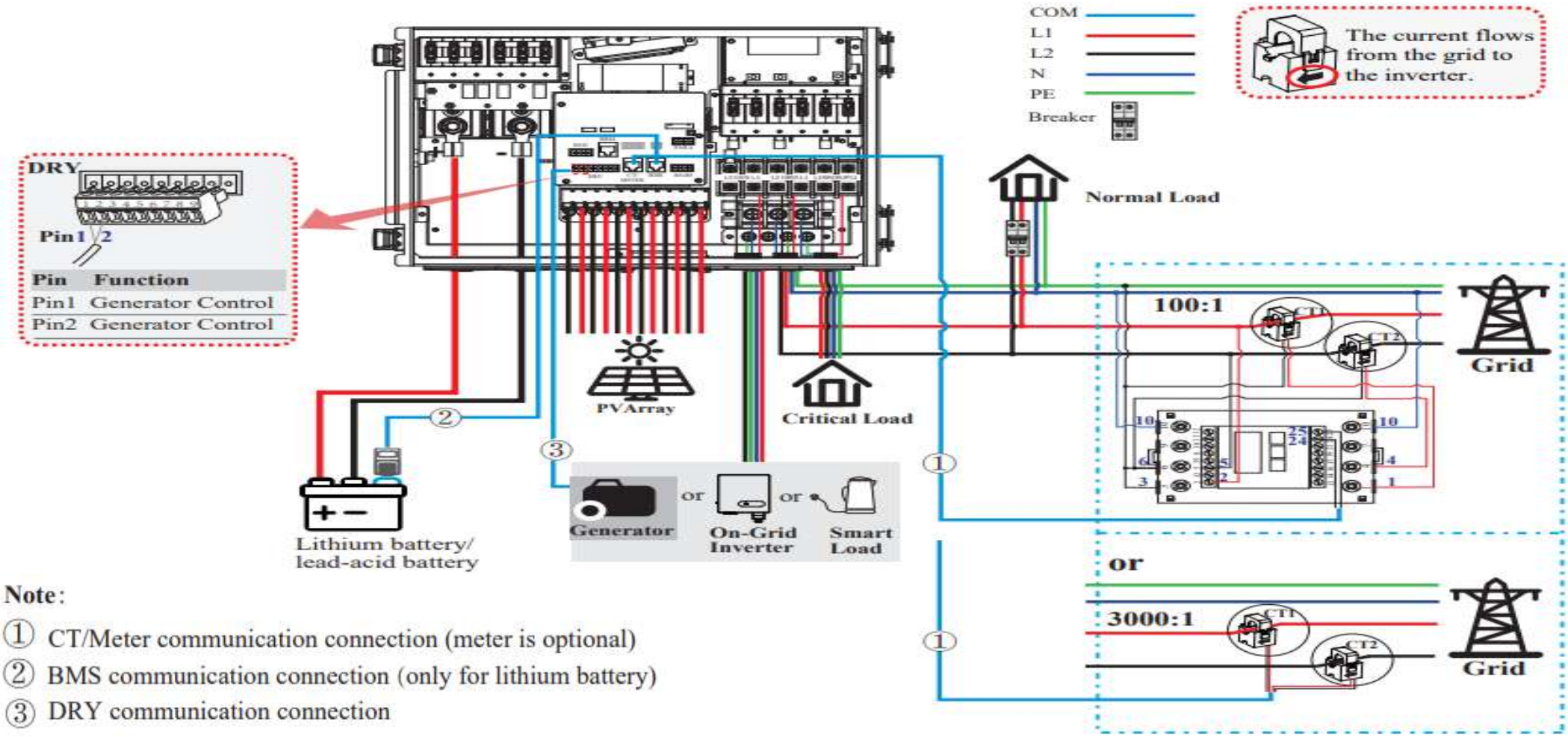
4.1 Wiring Diagram

Standard Non-parallel Wiring Diagram

GRID

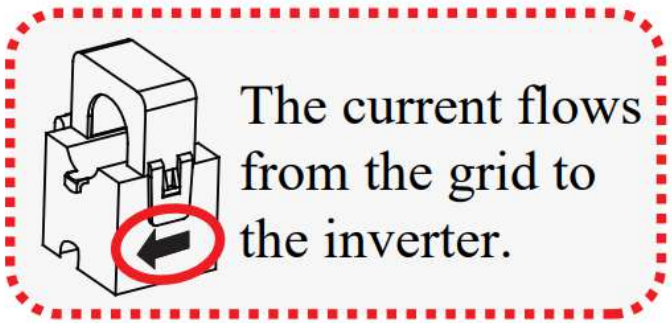
Diagram 01

120/240Vac Split Phase
120/208Vac 2/3 Phase



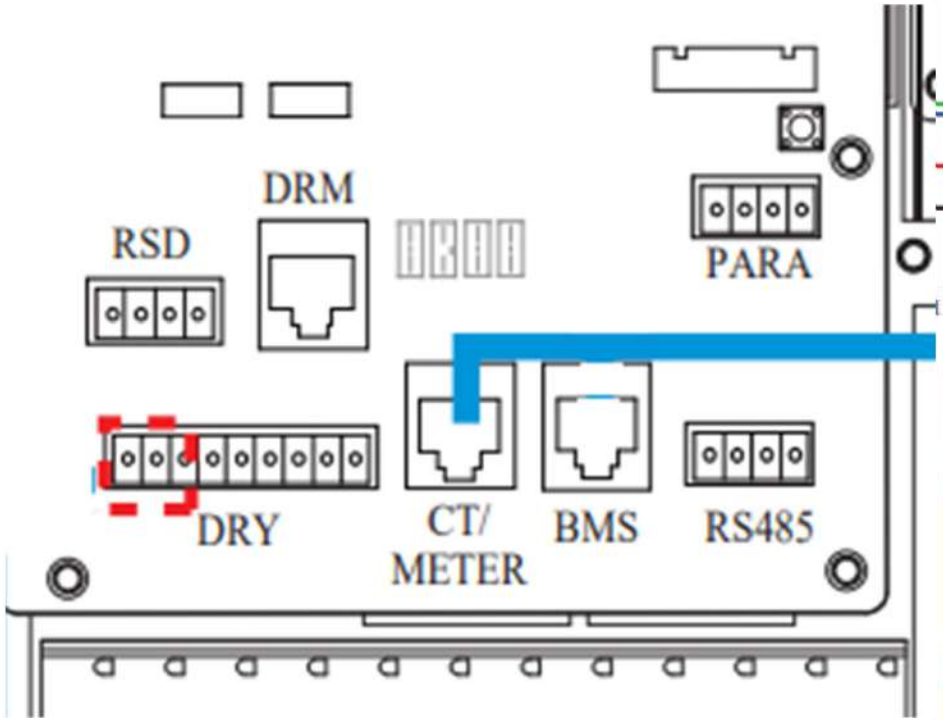
Note:

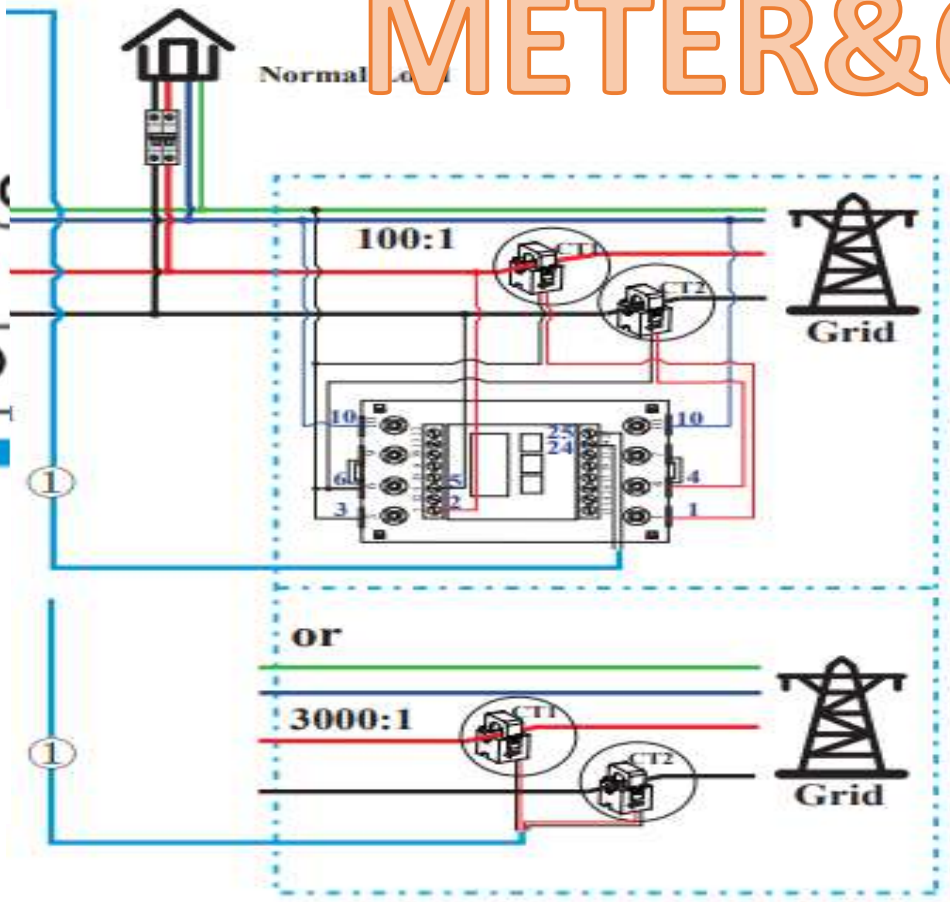
① CT/Meter communication connection (meter is optional)
② BMS communication connection (only for lithium battery)
③ DRY communication connection


The current flows
from the grid to
the inverter.


COM
L1
L2
N
PE
Breaker
The current flows
from the grid to
the inverter.

METER&CT

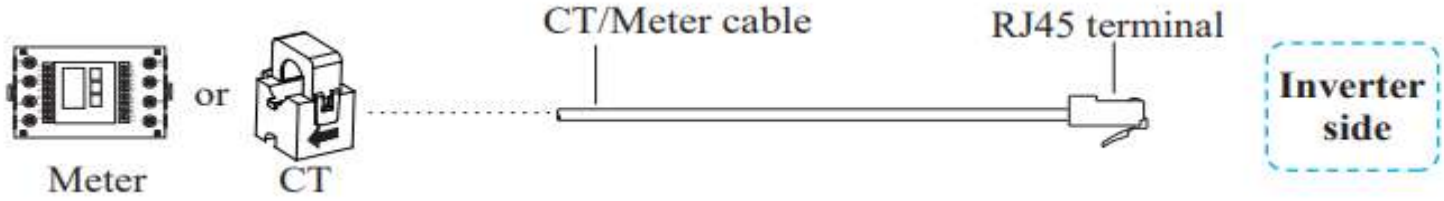

DRM
RSD
PARA
DRY
CT/
METER
BMS
RS485


Normal
100:1
Grid
or
3000:1
Grid

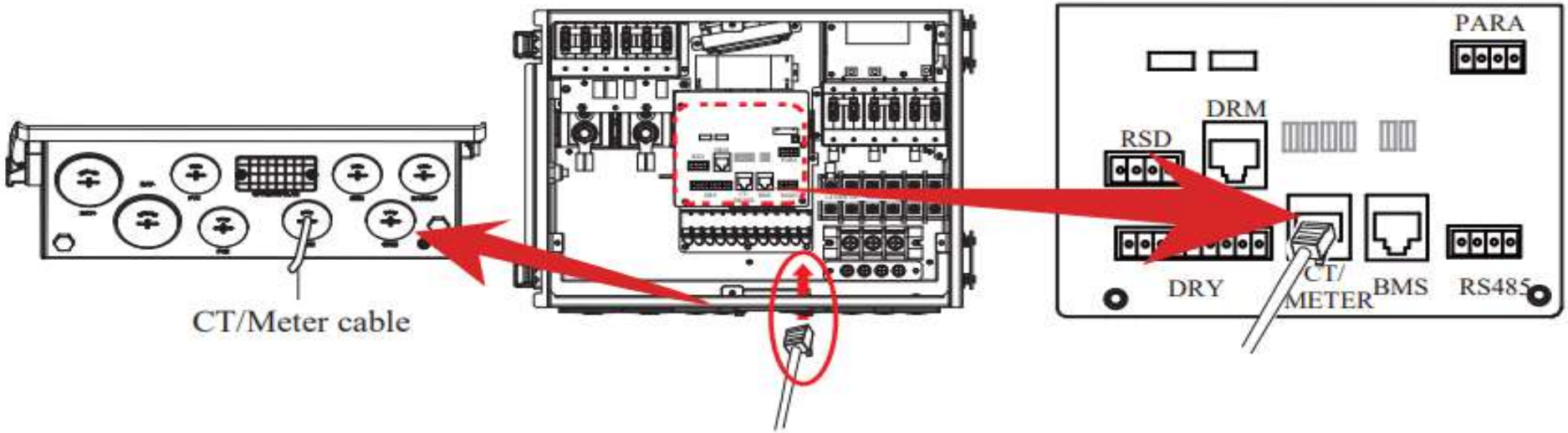
• **CT/Meter communication cable connection steps:**

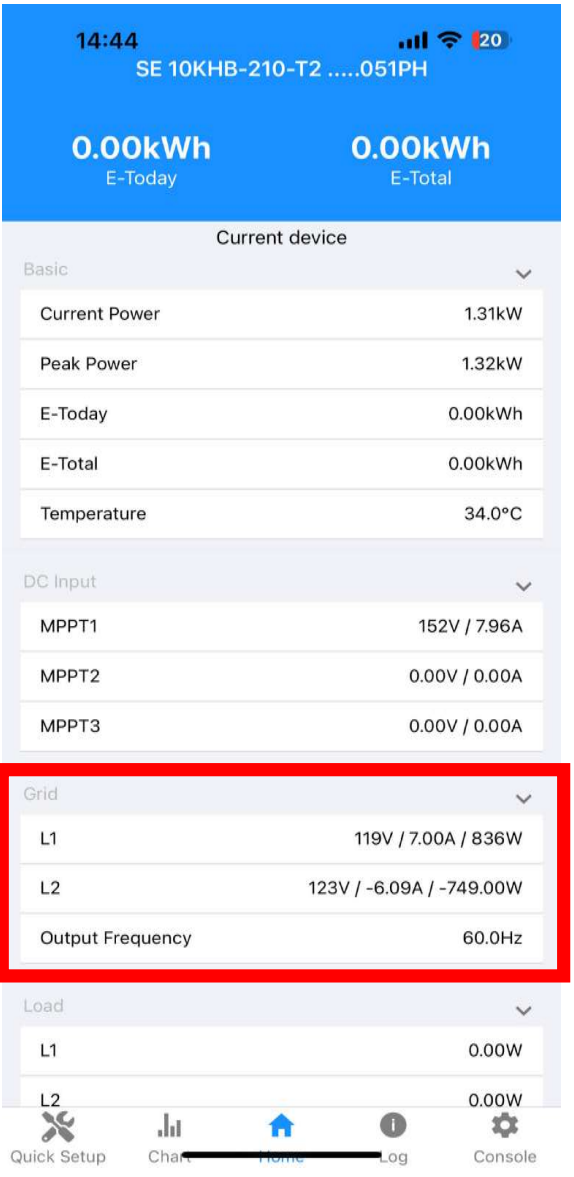
GRID

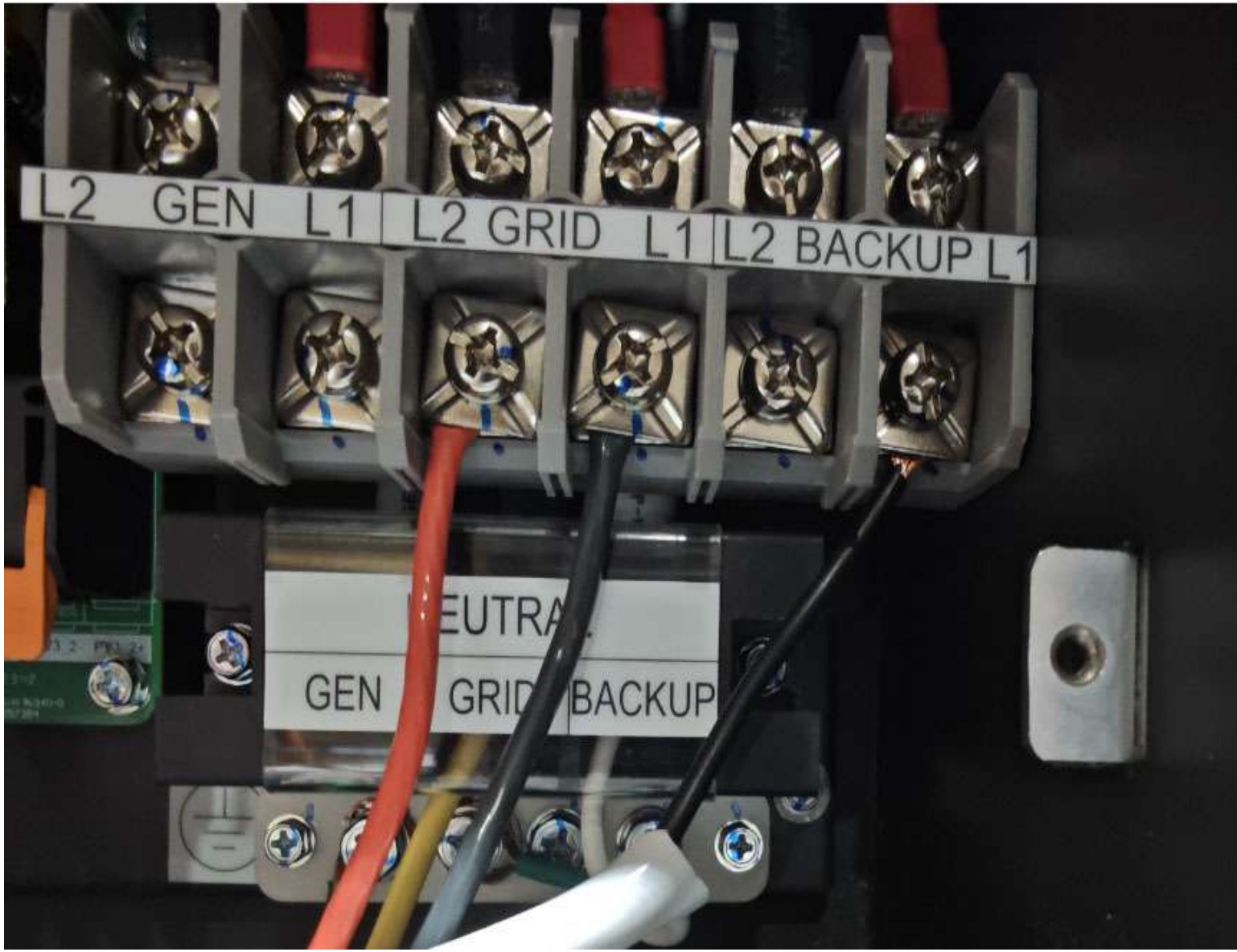
a. Make the RJ45 terminal according to above function description of each Pin definition.



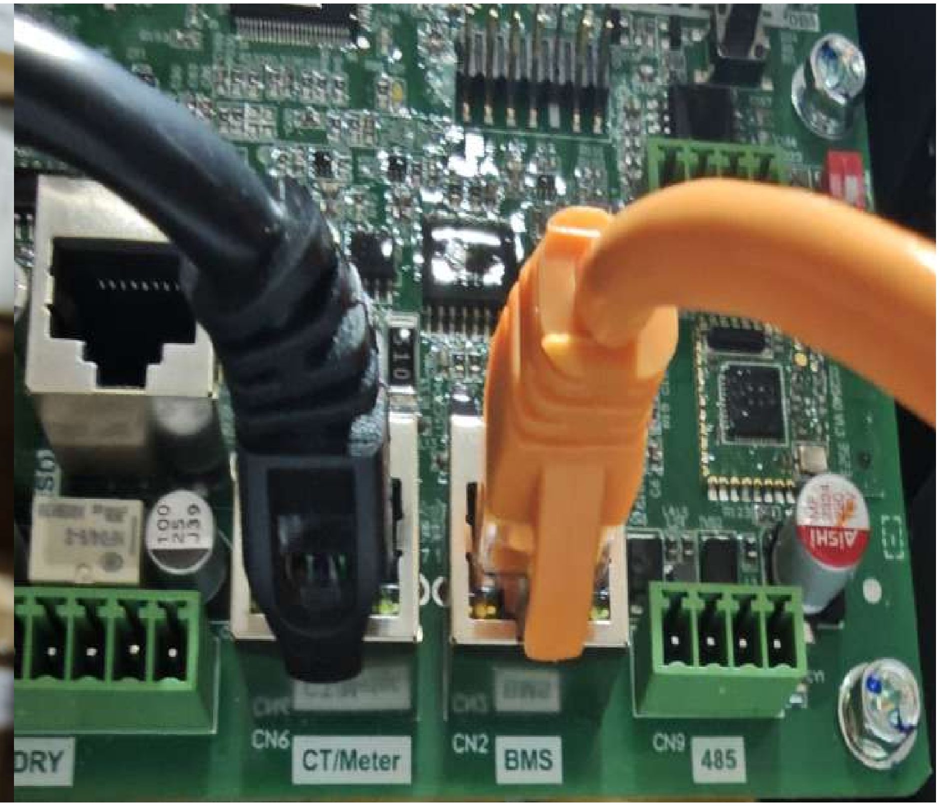
b. Lead the CT/Meter cable through the COM port. And insert the RJ45 terminal into CT/METER port.




14:44
SE 10KHB-210-T2 .....051PH
0.00kWh
E-Today
0.00kWh
E-Total
Current device
Basic
Current Power 1.31kW
Peak Power 1.32kW
E-Today 0.00kWh
E-Total 0.00kWh
Temperature 34.0°C
DC Input
MPPT1 152V / 7.96A
MPPT2 0.00V / 0.00A
MPPT3 0.00V / 0.00A
Grid
L1 119V / 7.00A / 836W
L2 123V / -6.09A / -749.00W
Output Frequency 60.0Hz
Load
L1 0.00W
L2 0.00W
Quick Setup
Chart
Home
Log
Console

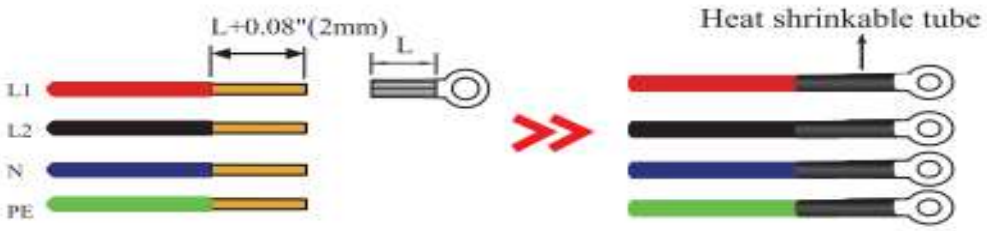

L2 GEN L1
L2 GRID L1
L2 BACKUP L1
GEN
BACKUP


STMHALL
HY33C82
L1
L2
XIAOMI
2024.03.31 18:09


DRY
CN6
CT/Meter
CN2
BMS
CN9
485

9 GRID/BACKUP/GEN Connection

Before connecting the GRID/BACKUP/GEN terminal, ensure that both the AC terminal and the DC terminal are powered off and the PV switch is OFF. Otherwise there is a risk of high voltage shock.

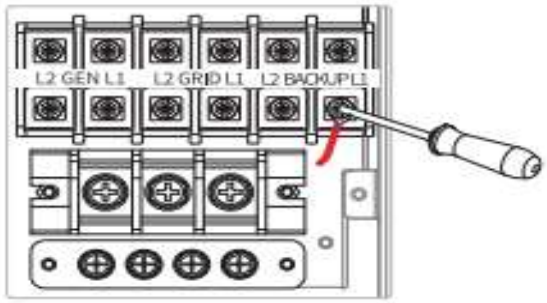


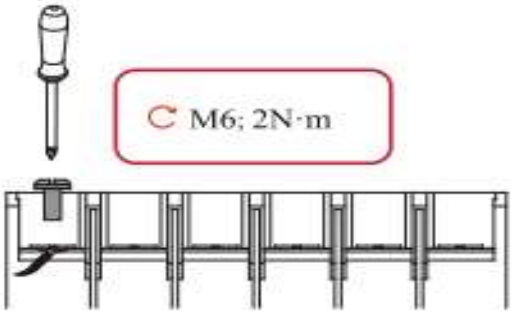
It is recommended to use outdoor dedicated cables.

AC	Wire Size	OT Terminal
GEN	6-4AWG	OT16-6.4
GRID	4-2AWG	
BACKUP	4-2AWG	

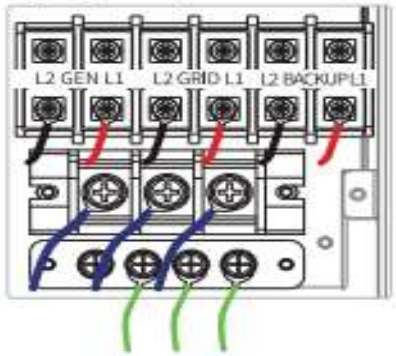
1 Wires making.

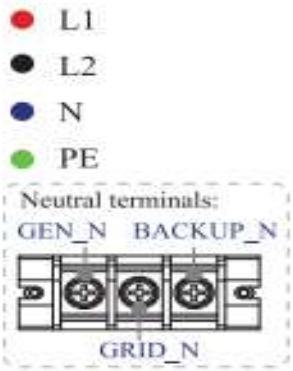
- Thread the wires into wire box through corresponding GEN/GRID/BACKUP ports.
- According to the label on terminal blocks, fit wires' connectors in and tighten terminal screws. Connect PE firstly.
- Make sure the connection is secured.



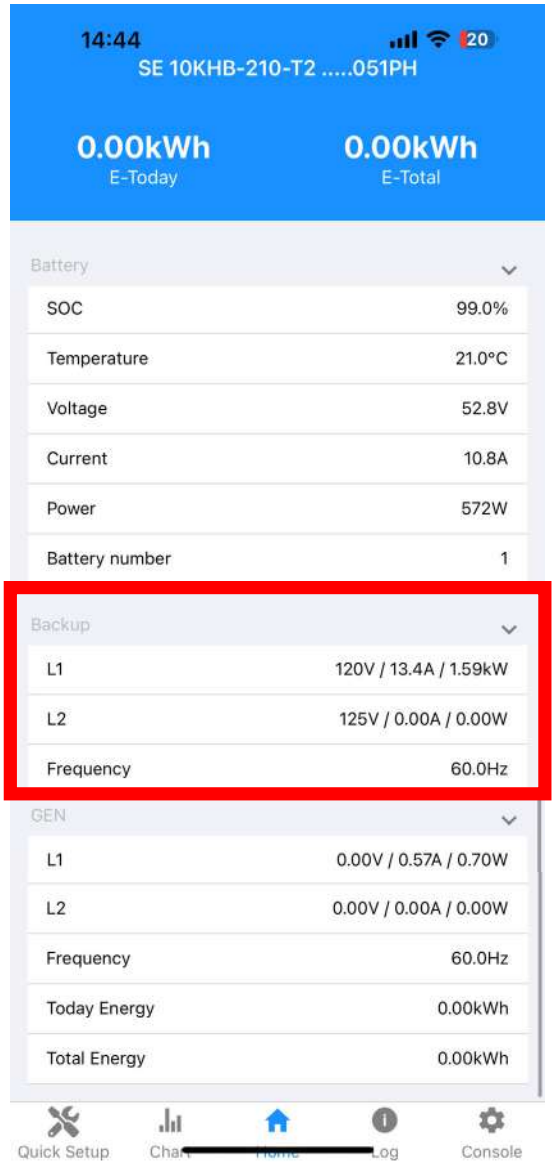


Split phase (120/240Vac)

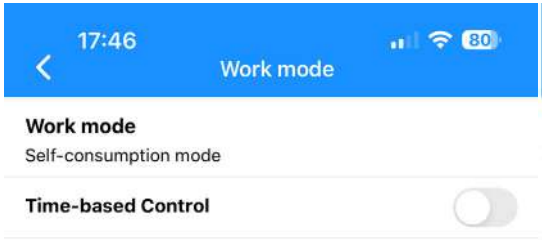




2


14:44
20
SE 10KHB-210-T2 .....051PH
0.00kWh
E-Today
0.00kWh
E-Total
Battery
SOC 99.0%
Temperature 21.0°C
Voltage 52.8V
Current 10.8A
Power 572W
Battery number 1
Backup
L1 120V / 13.4A / 1.59kW
L2 125V / 0.00A / 0.00W
Frequency 60.0Hz
GEN
L1 0.00V / 0.57A / 0.70W
L2 0.00V / 0.00A / 0.00W
Frequency 60.0Hz
Today Energy 0.00kWh
Total Energy 0.00kWh
Quick Setup
Log
Console

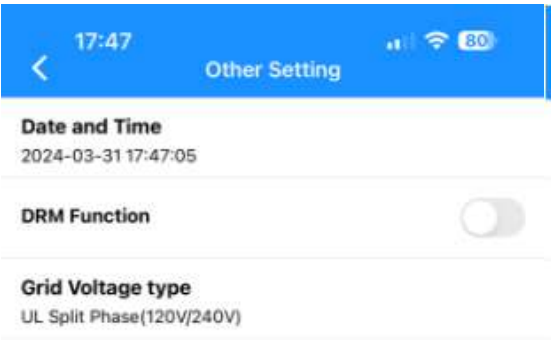

PV
BAT
GRID
BACKUP
COM
ALARM

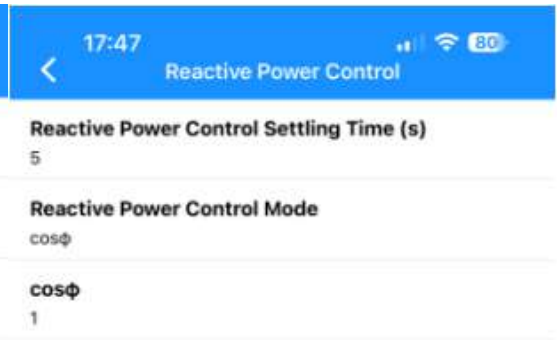

17:46
Work mode
Work mode
Self-consumption mode
Time-based Control

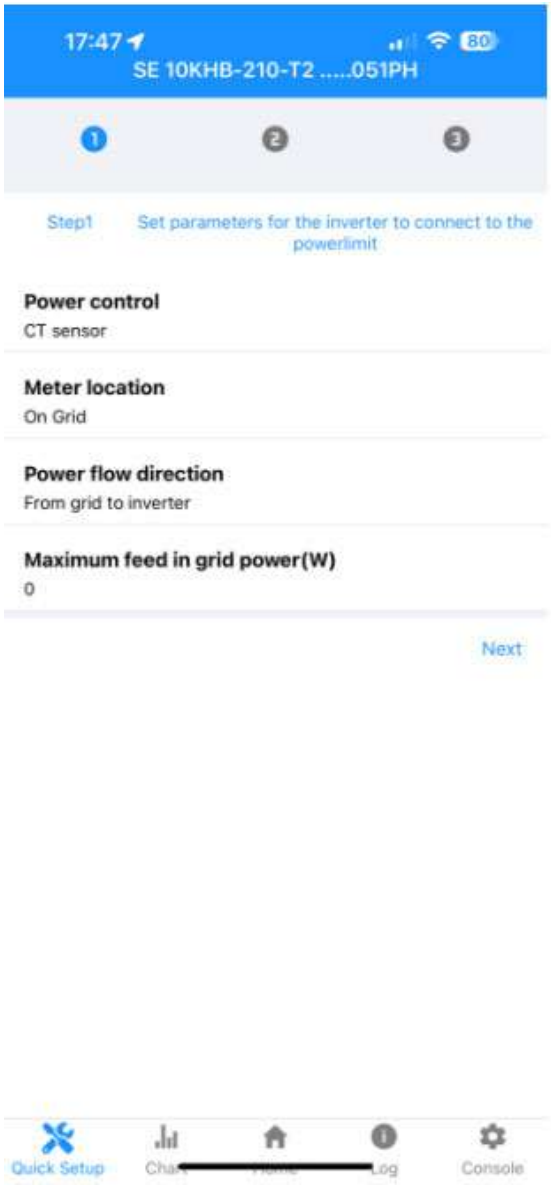

17:46
Backup Load
Backup Output
Minimum backup output voltage(V)
176
Maximum backup output voltage(V)
264
Rated output voltage(V)
220V
Min.initiation/startup battery capacity when off-grid(%)
20

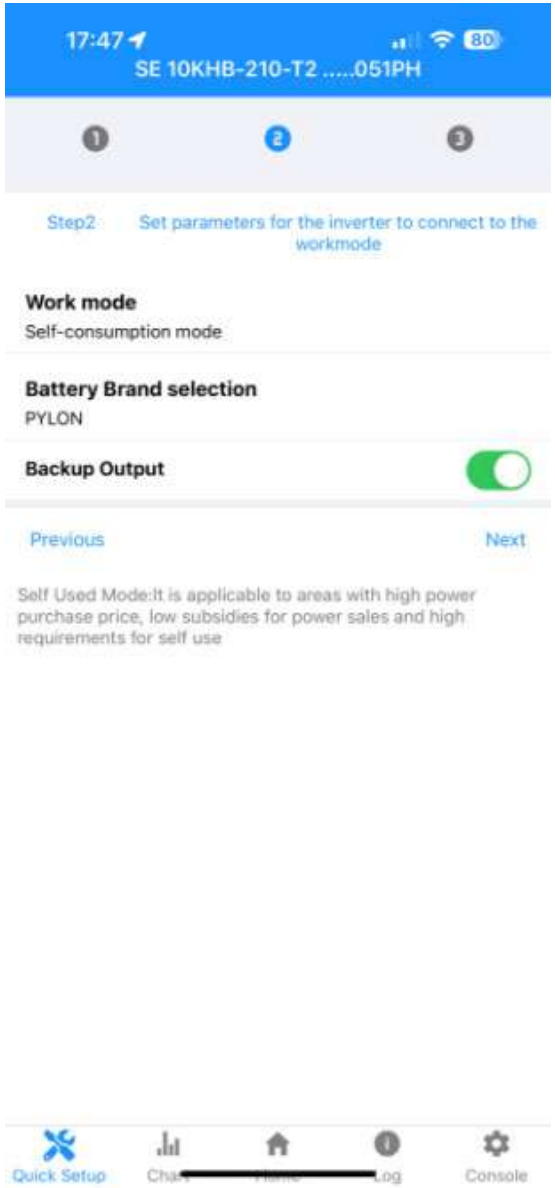

17:46
Other
Lithium battery activation
Parallel Mode
Buzzer ON
Capacity Mode
SOC(%)
Support Normal Load

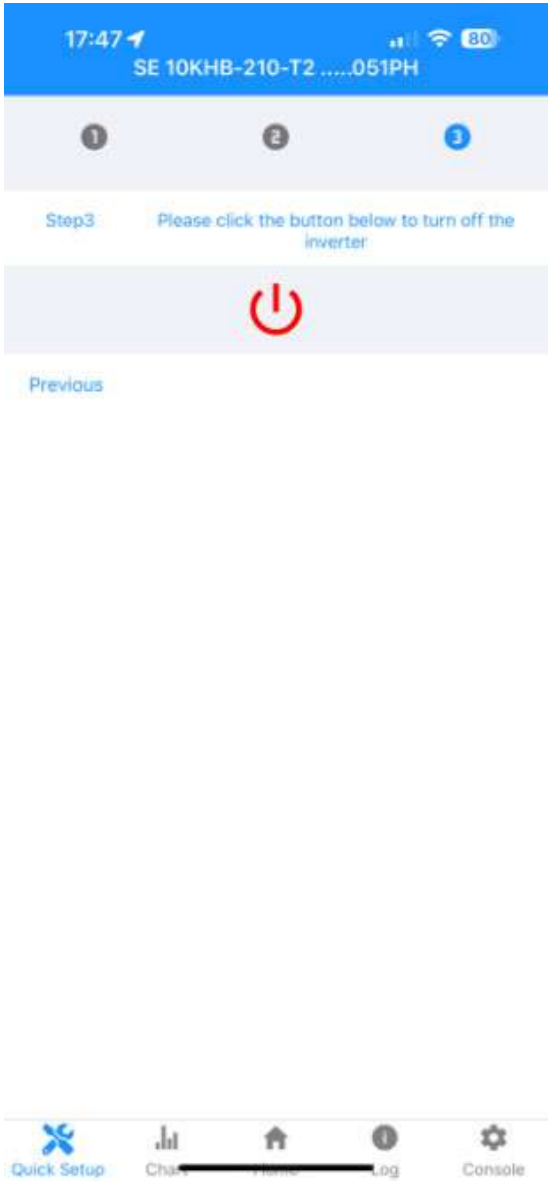

17:47
Power Limit
Power control
CT sensor
Meter location
On Grid
Power flow direction
From grid to inverter
Maximum feed in grid power(W)
0
Power derating control mode
Independent phase power
Maximum permit consumption from Grid(W)
100


17:47
80
Other Setting
Date and Time
2024-03-31 17:47:05
DRM Function
Grid Voltage type
UL Split Phase(120V/240V)


17:47
80
Reactive Power Control
Reactive Power Control Settling Time (s)
5
Reactive Power Control Mode
cosφ
cosφ
1


17:47
80
SE 10KHB-210-T2 .....051PH
1
2
3
Step1
Set parameters for the inverter to connect to the powerlimit
Power control
CT sensor
Meter location
On Grid
Power flow direction
From grid to inverter
Maximum feed in grid power(W)
0
Next
Quick Setup
Console


17:47
80
SE 10KHB-210-T2 .....051PH
1
2
3
Step2
Set parameters for the inverter to connect to the workmode
Work mode
Self-consumption mode
Battery Brand selection
PYLON
Backup Output
Previous
Next
Self Used Mode:It is applicable to areas with high power purchase price, low subsidies for power sales and high requirements for self use
Quick Setup
Console


17:47
80
SE 10KHB-210-T2 .....051PH
1
2
3
Step3
Please click the button below to turn off the inverter
Previous
Quick Setup
Console