Quick Installation Guide _ for Parallel System
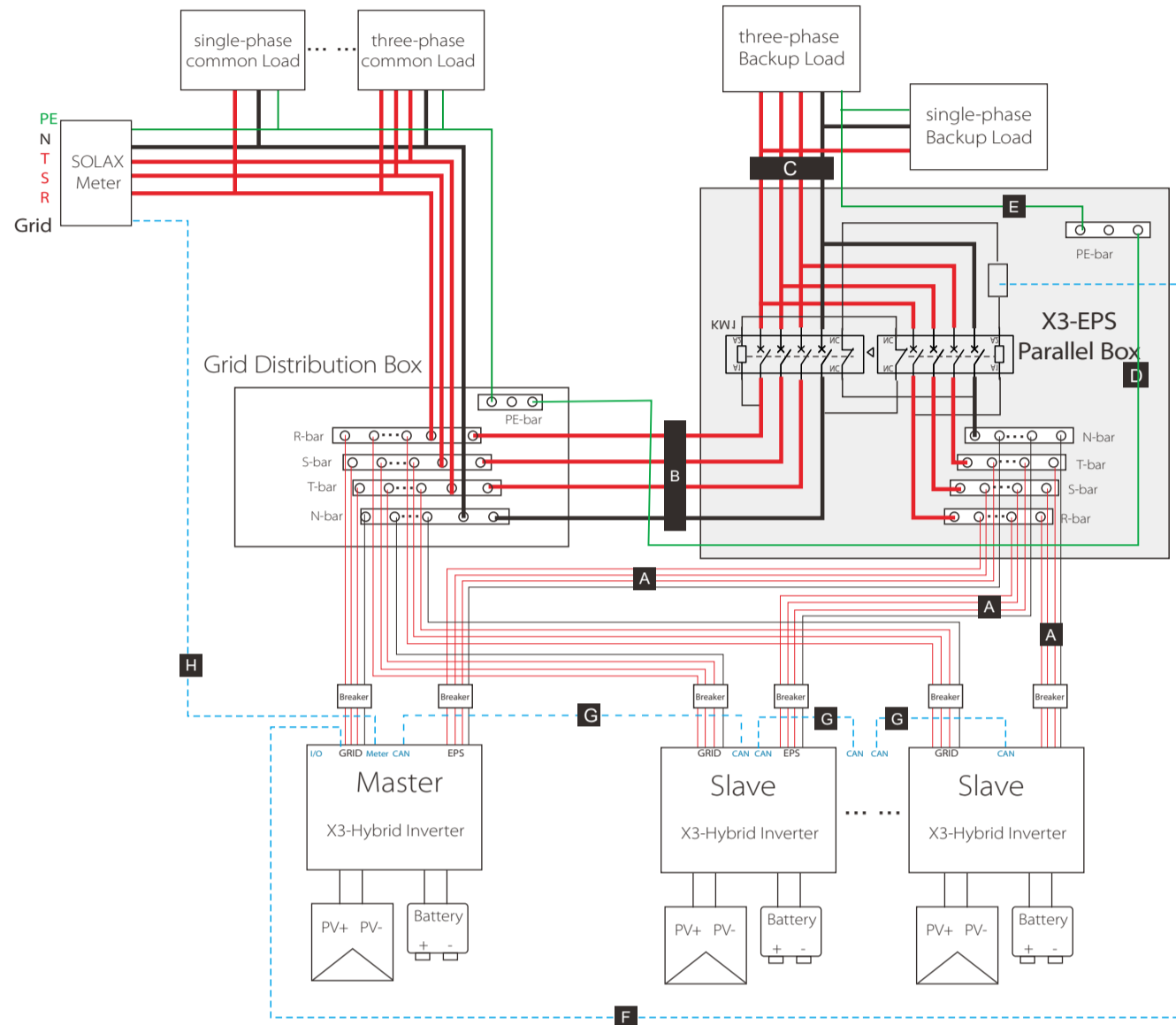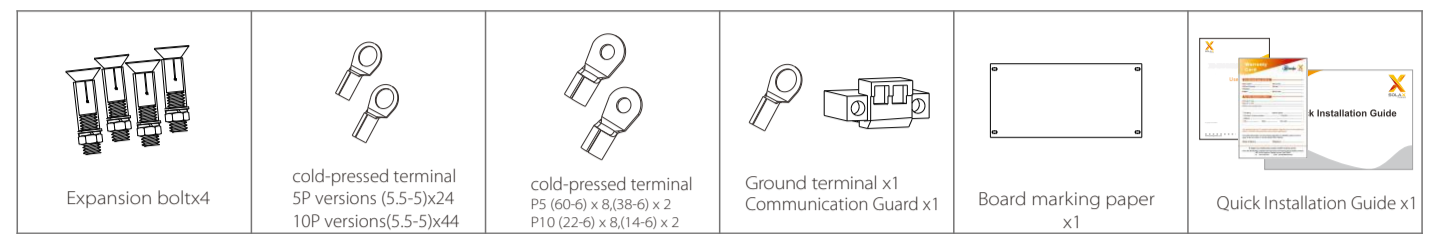
Part 1   Preparation

1.1   System Diagram

Only cables marked with majuscule in below system diagram will be introduced in this manual.
For other cables connection, here will not be discribed.

A   EPS connection between Inverter and parallel box (refer to Part 2)
B   Grid connection between Grid Distribution Box and parallel box(refer to Part 2)
C   EPS Load connection between EPS load and parallel box (refer to Part 2)
D   Earth connection between parallel box and external earth bar (refer to Part 2)
E   Earth connection between parallel box and EPS Load (refer to Part 2)
F   Communication connection between parallel box and Master Inverter (refer to Part 2)
G   Communication connection between Inverters (refer to Part 3)
H   Communication connection between Master Inverter and SOLAX meter (refer to Part 3)


1.2   Packing List

| Expansion boltx4 | cold-pressed terminal 5P versions (5.5-5)x24 10P versions(5.5-5)x44 | cold-pressed terminal P5 (60-6) x 8,(38-6) x 2 P10 (22-6) x 8,(14-6) x 2 | Ground terminal x1 Communication Guard x1 | Board marking paper x1 | Quick Installation Guide x1 |

1.3   Cable Preparation

- Press the terminal harness.

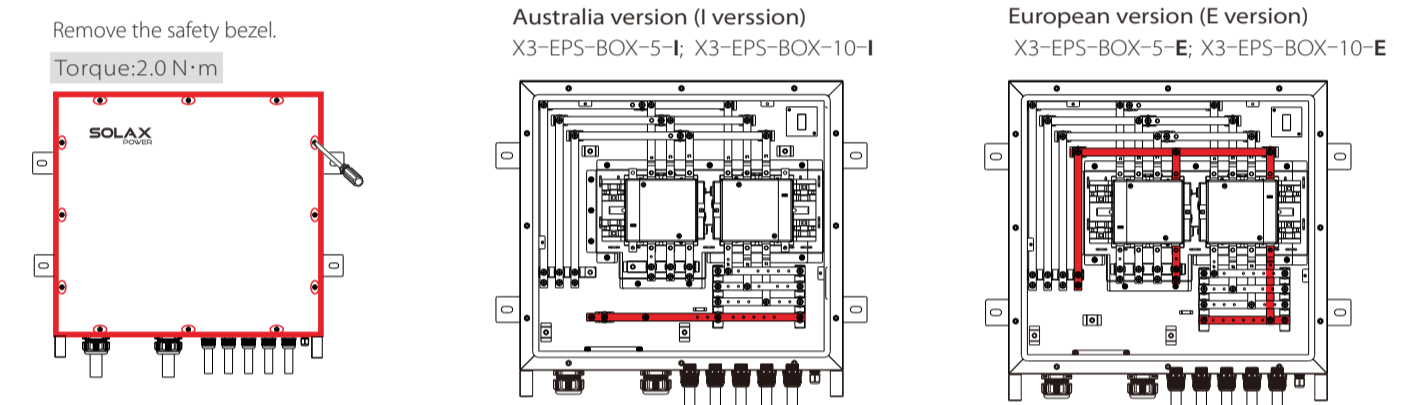| Connectors	Application	Connectors	Application	Connectors	Application	Connectors	Application
	L1/L2/L3/N EPS Connector X 5(10)pairs		L1/L2/L3/N Grid Connector X 2pairs		G ground connector X 2 pairs		Switching communication connection X1 pcs

1.4   Mounting

Use the attachment bag of control cardboard drill four Φ 10 holes.
Depth: at least 60mm
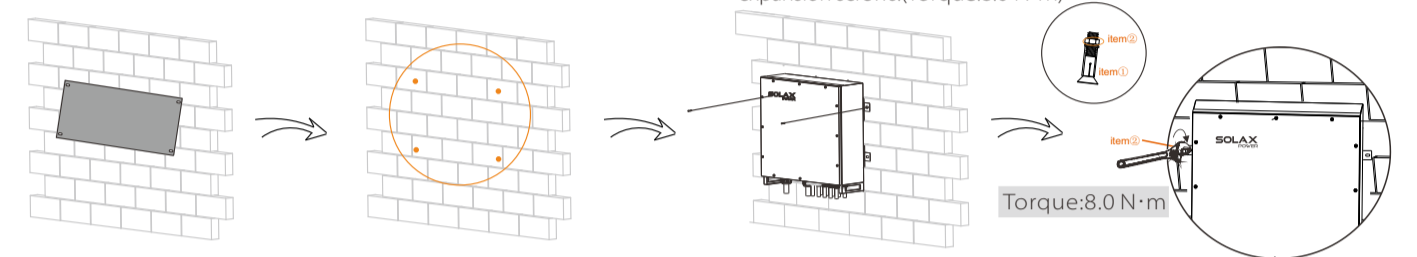
- Tighten the expansion tubes.
- Pass the expansion screws though the M6 washers, then screw the expansion screws.(Torque:8.0 N·m)

Torque:8.0 N·m

Notes: Affix the empty cabinet on the wall first before proceeding any installation. It will be too dangerous to move as the box fitting with switch will overweigh cabinet handle's bearing limit.

1.5   Internal Overview of EPS Parallel BOX

Remove the safety bezel.
Torque:2.0 N·m

Australia version (I verssion)
X3-EPS-BOX-5-**I**; X3-EPS-BOX-10-**I**

European version (E version)
X3-EPS-BOX-5-**E**; X3-EPS-BOX-10-**E**

Warning: The top cover must be gently lifted, as there is a ground wire between the top cover and the fuselage to prevent it from breaking.

Part 2   Installation of EPS Parallel BOX

2.1   Connection Overview of EPS Parallel BOX

Important Warning!
· Every cable must be connected according to correct line sequence(R-R, S-S, T-T, N-N), otherwise any small misoperation may cause the system running failed.

2.2   Back-up Load Connection
2.3   Grid Connection
2.4   EPS Connection
2.5   Communication Connection
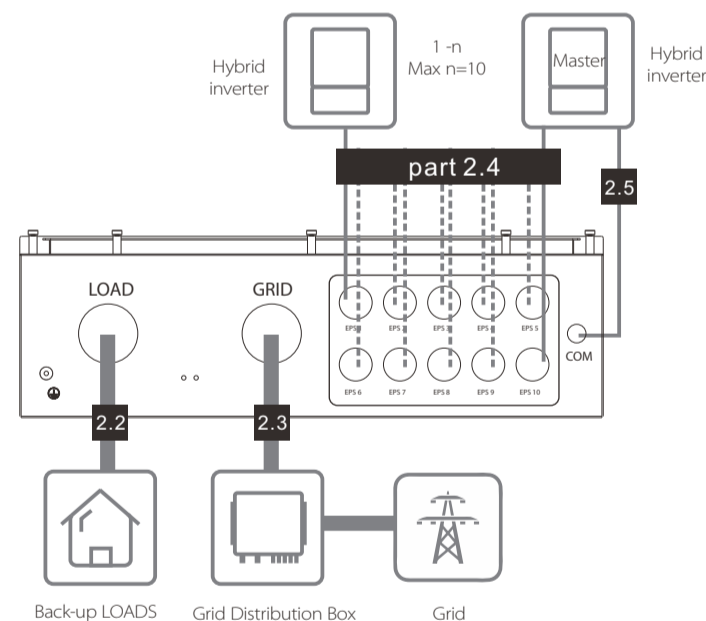
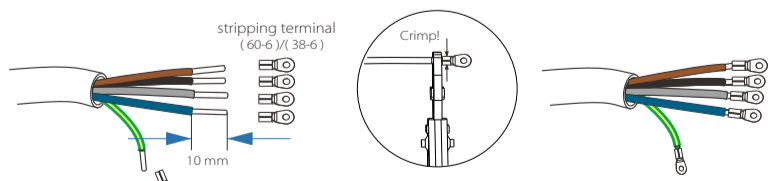### 2.2   Back-up Load Connection

Connection of EPS Parallel Box side

➤ Wire size recommended:

| Model	X3-ESP-P5-I X3-ESP-P5-E	X3-ESP-P10-I X3-ESP-P10-E
R-wire, S-wire, T-wire, N-wire	≥21mm² (4WAG)＊ 4 PCS	≥50mm² (0WAG)＊ 4 PCS
PE-wire	≥10mm² (7WAG)＊ 1 PCS	≥20mm² (5WAG)＊ 1 PCS
Note: **N bar** of I version and **N bar** of E version are different.		

➤ Make Load wires
Remove 10mm insulation from wire ends, then Insert the stripping terminal.
Press the terminal head with the blank holder.

➤ Screw wires
Screw wires through the LOAD port on the bottom of the BOX to corresponding Load ports (R-bar, S-bar, T-bar, N-bar,G-bar) by screwdriver. (refer to picture as right)
Torque:4.0 N·m

I version
E version
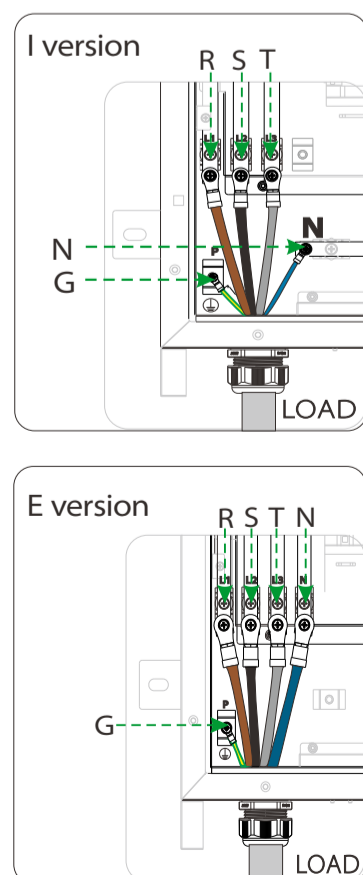
Connection of back-up load side

➤ Selecting appropriate Back-up loads
The requirement shown as below must be satisfied:
1: Algebraic apparent power of back-up loads must be less than Algebraic apparent power of hybrid system * 0.9.
2: Algebraic RCD apparent power of RCD back-up loads must be less than Algebraic apparent power of hybrid system * 0.6.

Back-up Load connection of loads side should be analyzed and operated depending on specific loads. Here will not be described into details.

2.3   GRID Connection
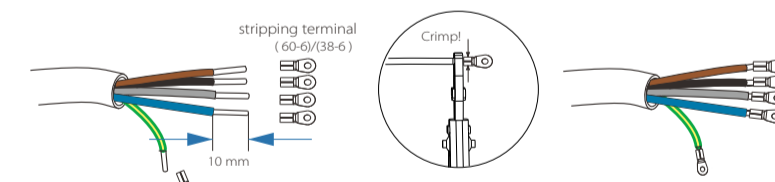
Connection of EPS Parallel Box side

➤ Wire size recommended:

| Model	X3-ESP-P5-I X3-ESP-P5-E	X3-ESP-P10-I X3-ESP-P10-E
R-wire, S-wire, T-wire, N-wire	≥21mm² (4WAG)＊ 4 PCS	≥50mm² (0WAG)＊ 4 PCS
PE-wire	≥10mm² (6WAG)＊ 1 PCS	≥20mm² (6WAG)＊ 1 PCS
Note: **N bar** of I version and **N bar** of E version are different.		

➤ Make Grid wires
Remove 10mm insulation from wire ends, then Insert the stripping terminal.
Press the terminal head with the blank holder.

➤ Screw wires
Screw wires through the LOAD port on the bottom of the BOX to corresponding Load ports (R-bar, S-bar, T-bar, N-bar,G-bar) by screwdriver. (refer to picture as below)
Torque:4.0 N·m

I version
E version
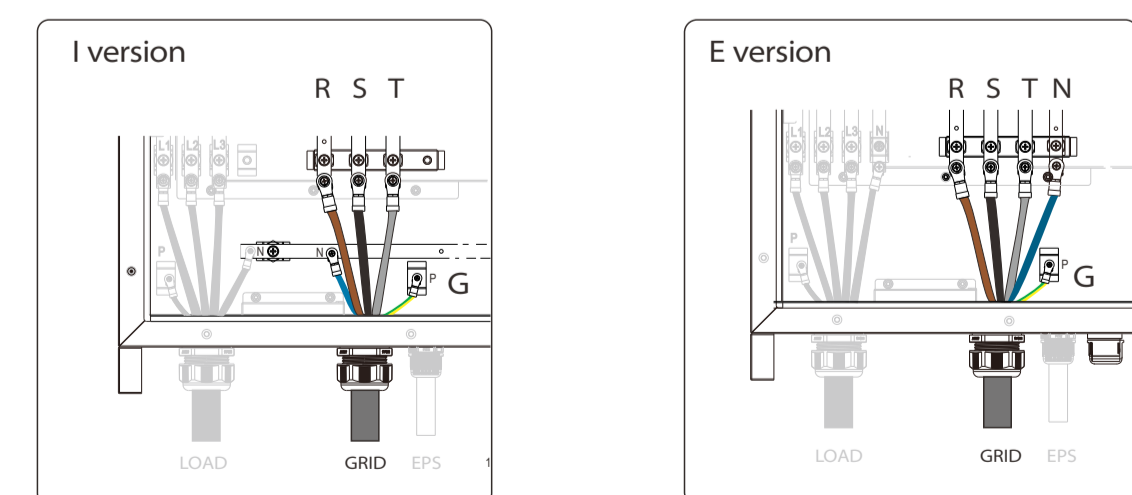
Connection of Grid distribution box side

Grid port connection of grid distribution box side should be analyzed and operated depending on field wiring condition.
Here will not be described into details.

Part 2   Installation of EPS Parallel BOX

## 2.4 EPS Connection

Connection of EPS Parallel Box side

➢ Wire size recommended:

Model	X3-ESP-P5-I X3-ESP-P5-E	X3-ESP-P10-I X3-ESP-P10-E
R-wire, S-wire, T-wire, N-wire	＞5mm² (10WAG) ＊ 4 PCSfor one EPS port	

4 wires needed for one EPS port(one inverter)

8 wires needed for two EPS ports (two inverter paralleled)

40 wires needed for ten EPS ports maximummly (ten inverter paralleled)
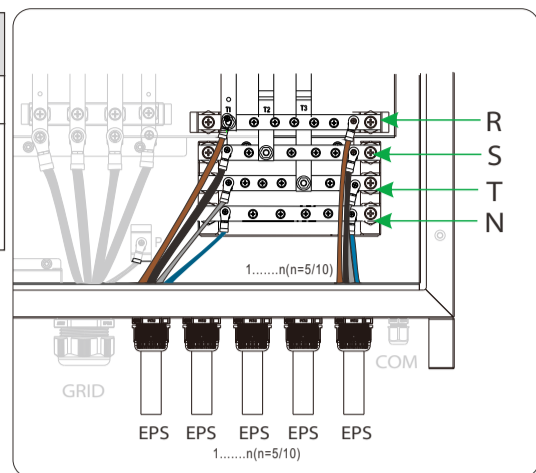
➢ Make EPS wires

Remove 10mm insulation from wire ends, then Insert the stripping terminal.
Press the terminal head with the blank holder.
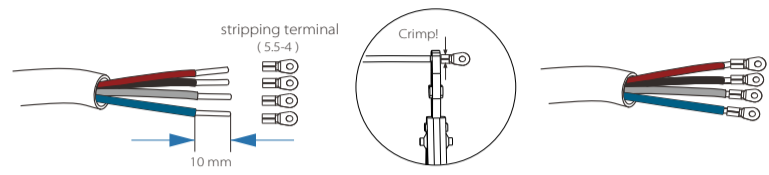
➢ Screw wires

Screw wires through the LOAD port on the bottom of the BOX to
corresponding Load ports (R-bar, S-bar, T-bar, N-bar,G-bar) by screwdriver.
(refer to picture as right)

Torque:1.0 N.m

Connection of Inverter side (please refer to Inverter User Manual for details)
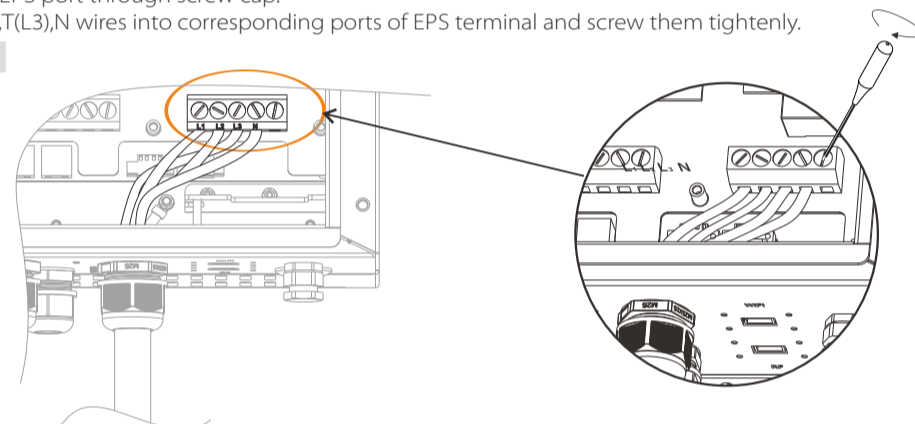
➢ Make other side of load wires

Remove 10mm insulation from wire ends, then Insert the AC terminal. Press the terminal head with the blank holder.
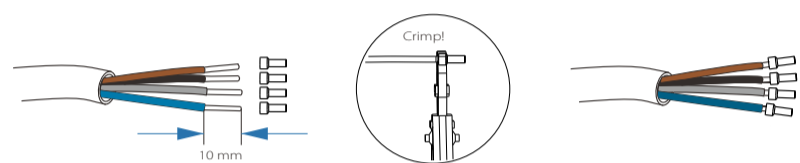
➢ Screw wires

Insert wires into EPS port through screw cap.
Insert R(L1),S(L2),T(L3),N wires into corresponding ports of EPS terminal and screw them tightenly.

Torque:1.2 N.m

2.5 Communication Connection

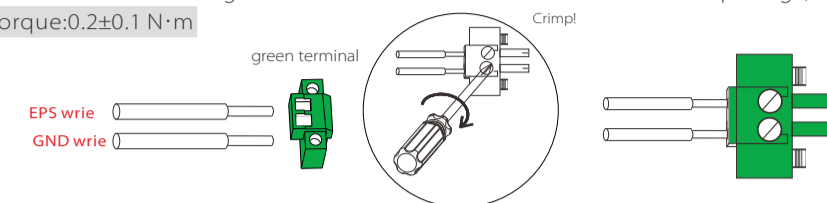### Connection of EPS Parallel Box side

➢ Wire size recommended:

Model	X3-ESP-P5-I X3-ESP-P5-E	X3-ESP-P10-I X3-ESP-P10-E
Communication wire	＞0.2mm² (24WAG) ＊ 2 PCS for one communiction port	

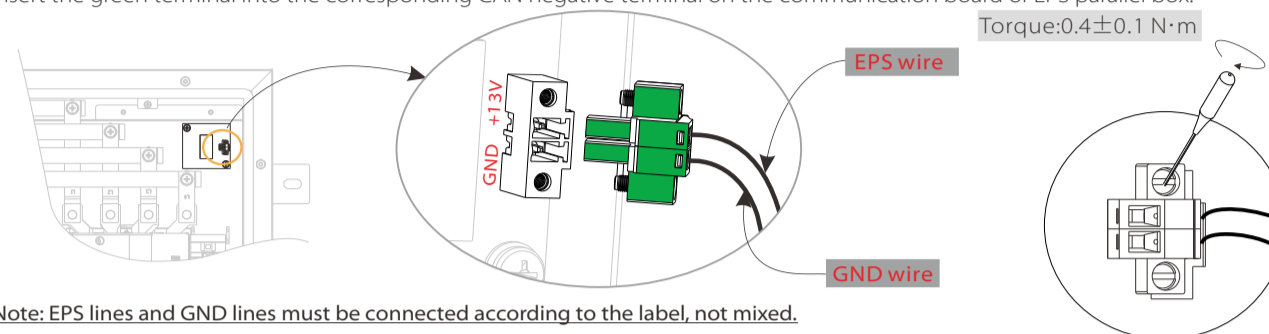➢ Make communication wires

Remove 4mm insulation from wire ends.
Insert the wires into the green terminal which can be found in accessories package, then use a screwdriver to lock the wires.

Torque:0.2±0.1 N·m

EPS wrie
GND wrie

➢ Install communication wires

Insert the green terminal into the corresponding CAN negative terminal on the communication board of EPS parallel box.

Torque:0.4±0.1 N·m

EPS wire
GND wire

Note: EPS lines and GND lines must be connected according to the label, not mixed.

Connection of Inverter side (please refer to Inverter User Manual for details)

➢ Prepare a connector and two communication wires.

communication cable   8pin terminal
(in accessories package)
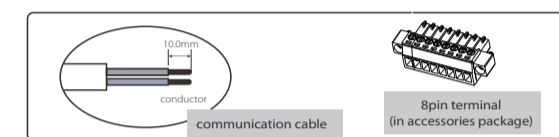
➢ Insert the wires

Unscrew the nut of connector on the bottom of the inverter and
insert two communication wires through it.
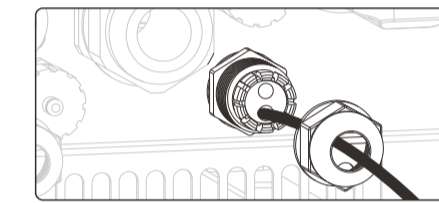

➢ Screw the wires

Trip the insulation from the communication
wires, then insert one side of wires into **pin5
and pin6** holes of the 8 pin positive terminal
which can be found in accessories package.
And then screw them tightly.

Torque:0.2±0.1 N·m

➢ Screw the terminal

Insert the positive terminal into the corresponding
negative terminal block inside of the inverter. And
then screw it tightly.

Torque:0.4±0.1 N·m
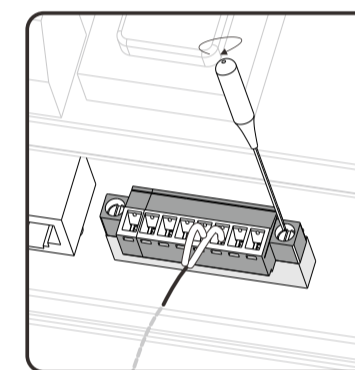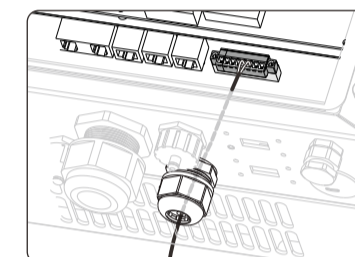
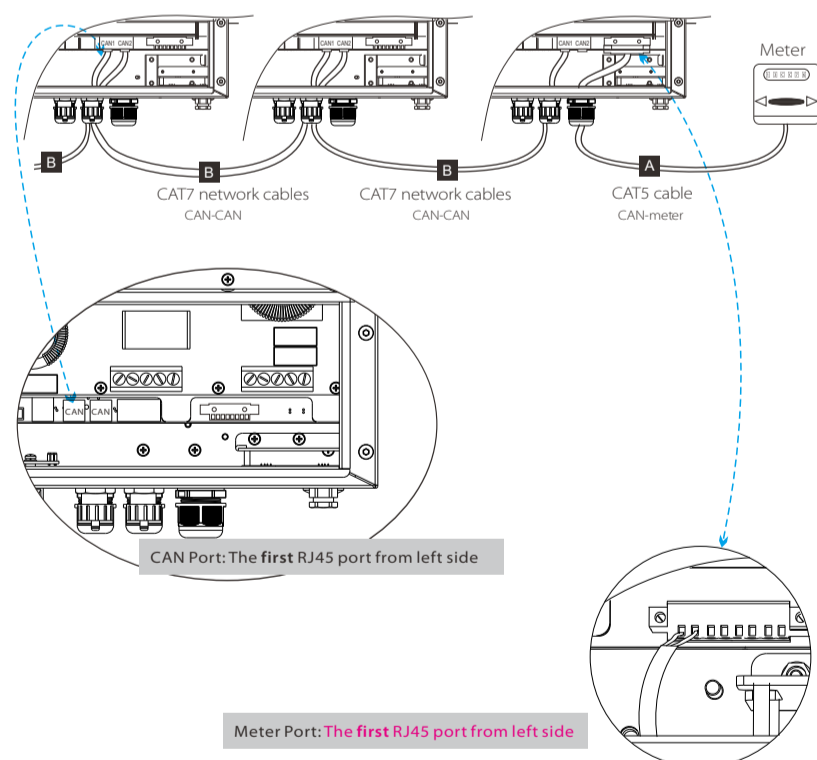# Part 3 Installation of Parallel System

➢ CAN-CAN connnection:

Insert one side of CAT7 cable into the first inverter's CAN port and the other side into the next inverter's CAN port.

➢ RS485-Meter connection:

Insert one side of CAT5 cable into the RS485 port of meter, and the other side into the
CAN 1 port of the first inverter or the CAN 2 port of the last inverter.

Please note the inverter connected with meter will be the Master Inverter and this
Master inverter must be connected with battery.

Meter

CAT7 network cables   CAT7 network cables   CAT5 cable
CAN-CAN   CAN-CAN   CAN-meter

CAN Port: The **first** RJ45 port from left side

Meter Port: The **first RJ45 port from left side**

Note: For specific cable operation of these cables, please refer to Inverter User Manual.

➢ Set the DIP switch of Master Inverter. (No need to set slaver's DIP switch)

- Remove the top-down cover from master inverter, and find the DIP switch between CAN2 port and LAN port on the control board.
- Push the white DIP switch of the main inverter and the last inverter connected from bottom to "ON" position with appropriate tweezers.
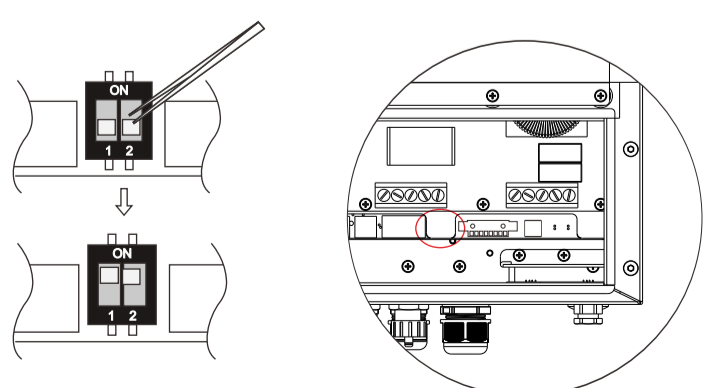

Part 4   LCD Operation

➢ There are three work modes in parallel system, and your acknowledge of different inverter's work modes will help you understand parallel
system better, therefore please read it carefully before operating.

Free mode	Only if no one inverter is set as a "Master", all inverters are in free mode in the system.
Master mode	When one inverter is set as a "Master", this inverter enters master mode. Master mode can be changed to free mode or slaver mode by LCD setting.
Slave mode	Once one inverter is set as a "Master", all other inverters will enter slaver mode automatically. Slaver mode can not be changed from other modes by LCD setting.

➢ "Master Inverter" setting in LCD display

Find the inverter connected with the SOLAX meter ,then enter setting page of the inverter LCD display, then click parallel setting, and choose
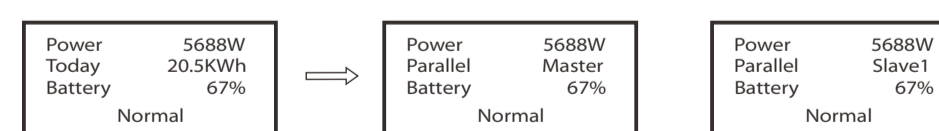"Master".

- If one inverter want to exit from this parallel system ,please do the stpe as below :
step 1: Disconnect all the network cables on the CAN port .
step 2: Enter setting page and click parallel setting,and choose "Free".

Setting
Battery Parallel Setting Reset

Parallel Setting	
Status	Free
>setting	
	Master
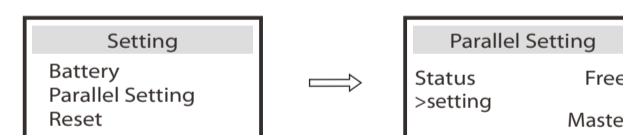
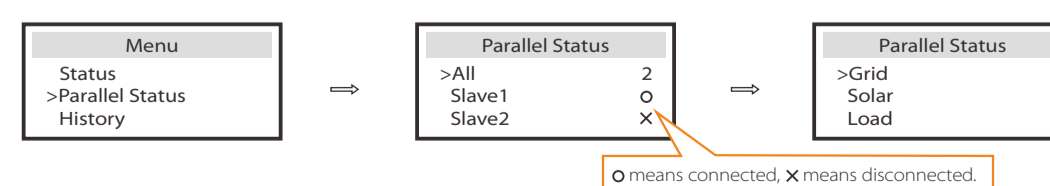Notes: Once this inverter is set as a "Master",all other inverters will enter "slave mode" automatically.

➢ Main display:

Once inverter enters parallel system, the "today yield" will be replaced by " Inveter Class", and parallel relevant fault has a higher priority than other
faults and will be showed firstly on main display.

Power	5688W
Today	20.5KWh
Battery	67%
Normal	

Power	5688W
Parallel	Master
Battery	67%
Normal	

Power	5688W
Parallel	Slave1
Battery	67%
Normal	

➢ Status display:

User can obtain all the status data from master inverter. System power and individual slaver inverter power can be
obtain in status display of master inverter.

Menu
Status
>Parallel Status
History

Parallel Status	
>All	2
Slave1	O
Slave2	X

Parallel Status
>Grid
Solar
Load

O means connected, X means disconnected.