DLB Box Manual
(Din Rail Mounting)

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1. Introduction

DLB box is a home energy managing solution including ev charger as the main equipment.
Making the dynamic loads balancing between home applications and ev charger.

DLB in Grid Mode: Automatically adjust the power of ev charger to avoid over-load of home line.
DLB in PV Mode: Optimize the PV power using with ev charger.

Features and Functions:

- Bidirectional current/power measurement on Grid only or Grid+PV
- Voltage measurement
- OLED screen
- Two Buttons Control
- Rs485 communication via RJ45 connector (Wireless solution is available)

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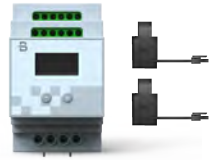
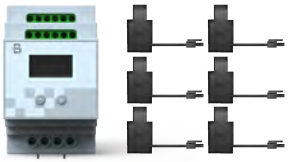
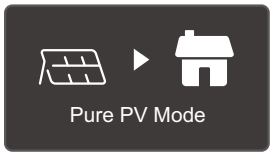
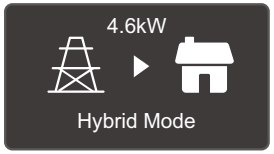
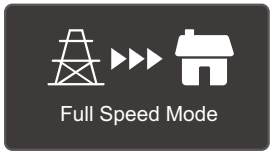
		
Model	BCP-DLB-01M/ BCP-DLB-11M	BCP-DLB-03M/ BCP-DLB-13M
Phase	Single Phase	Three Phase
Operating Mode	PV	PV
Extreme Mode	√	√
Night Automatic Full Speed Mode	√	√
Mode switch	√	√
Number of Current Transformers	1/2	3/6
Display	OLED	
Distance between DLB box and RV charger suppert	More than 300M	
Current Transformer Default Length	1.5m(Can be customized up to 15 meters)	
Installation	Rail installation/Screw fixing	
Communication	Rs485 (Via RJ45 connector)	

2. Working Mode Description

Grid Mode:
After set the over-load value via DLB box or APP according to the fuse of main line, the Grid mode DLB will limit the charger and home applications work below the value and protect the house circuit from over-load.

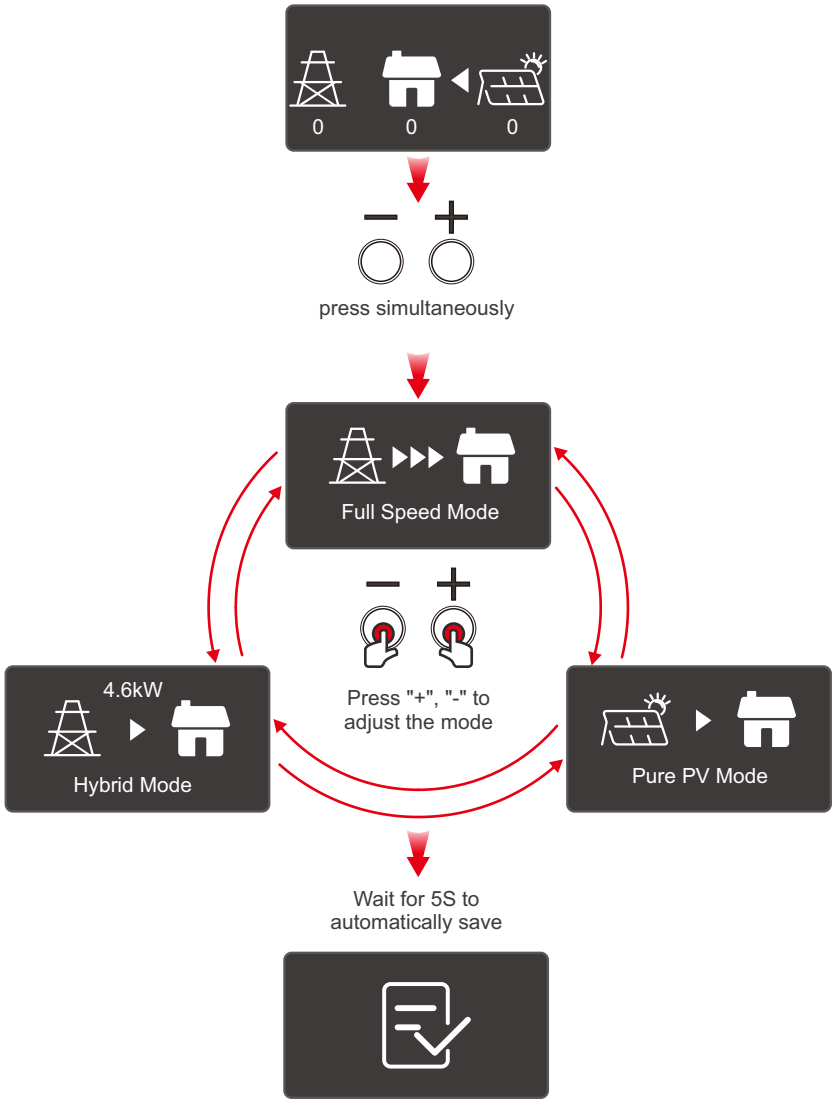
PV mode DLB supports Pure PV, Hybrid and Full Speed modes;
You can select one of the modes to make the DLB work as the way.
And you can active Night Full Speed Mode and Extreme Mode to meet your requirements.

Pure PV Mode 	DLB solution measures and manages the energy flow of house, prevents PV energy from flowing to the grid. In the case of PV power overflow, DLB will increase the power to charger and the charger consumes the overflown power. Once the PV power decreases and the grid power starts to flow into the house applications. The charger will reduce the charging power to avoid using grid power. EV charger is limited to consume grid power.
Hybrid Mode 	The grid power allowed to ev charger is not 0 anymore, in hybrid mode, ev charger consumes a certain of grid power.
Full Speed Mode 	The grid power is not limited anymore, the system always ensure ev charger is fully operated.
Night Full Speed Mode:	If you prefer the charger work at full speed from 20:00pm until 6:00am. To avoid the charger doesn't work at night without PV power, please active the mode in APP.

Extreme Mode:	If you prefer the charger stop charging and avoid using too much grid power in the case of PV power generation is not enough to maintain the minimum current of the EV charger(6A), please active the mode in APP.When the EV charger has enough current (eg 10A), restart charging.

3. Introduction to Mode Setting

3.1 How to set Pure PV mode, hybrid mode and full speed mode



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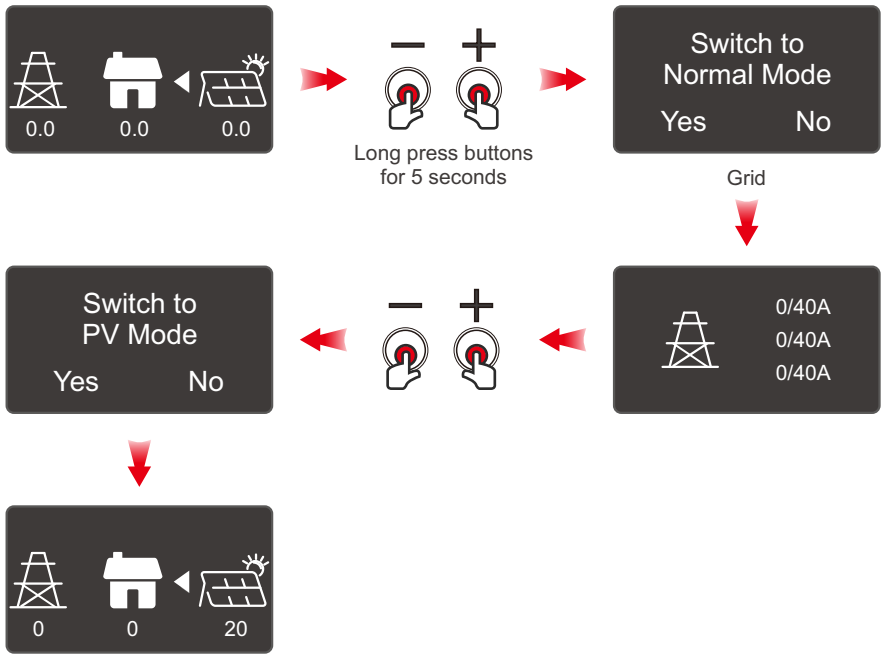
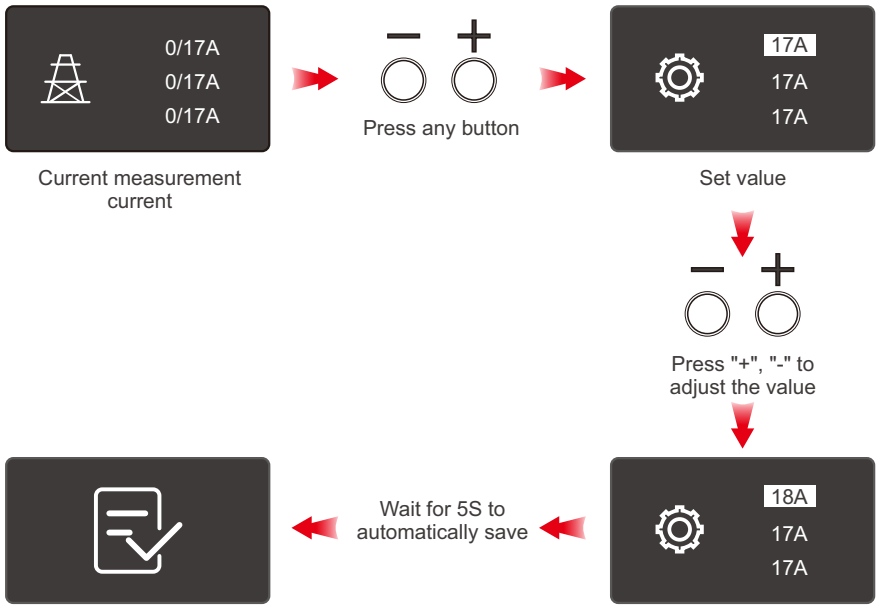
3.2 How to switch between Grid mode and PV mode

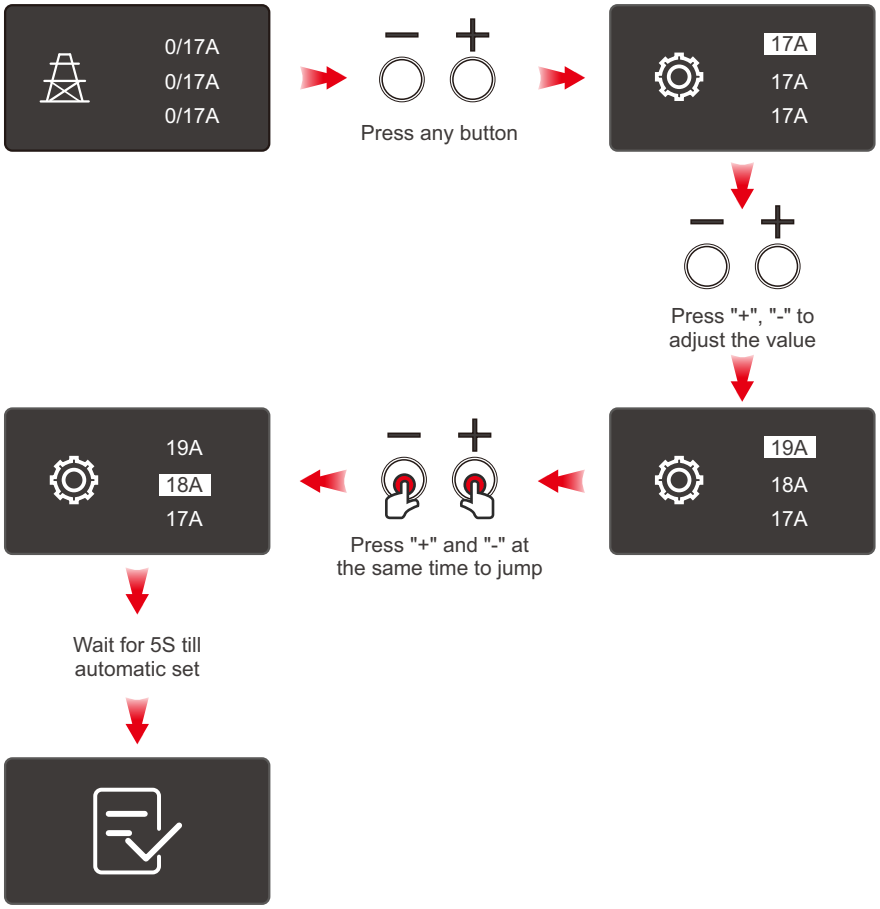


3.3 How to set the overload value for the distribution board in Grid mode

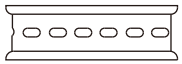
- **For 1 Phase DLB box**



- **For 3 Phase DLB box**

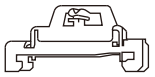


4. Accessories



Din rail 105mm

X1



Din rail fixing parts

X2

M4*30 expansion screw kit

X2

Current Transformer
(1-phasel DLB)*1
(3-phase DLB)*3
or
(1-phase Solar DLB)*2
(3-phase Solar DLB)*6

X1

Network cable - 5m
(RJ45 TIA/EIA-568B
8-core cat5 twisted pair cables)

X1

Solar DLB box

X1

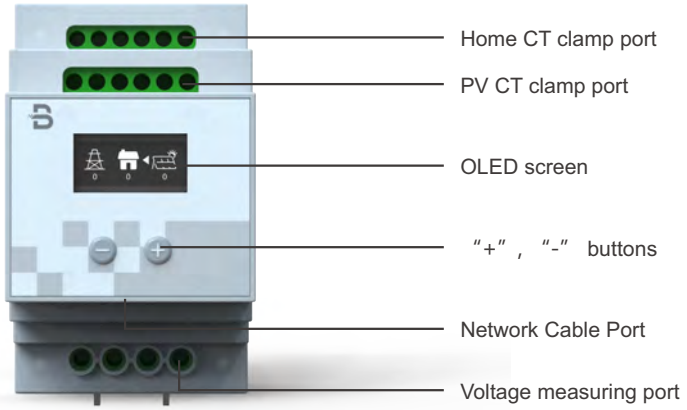
voltage acquisition cable-1m

X1

5. Safety Instruction:

- Don't install the DLB with power supply or power ON to avoid electric shock.
- Read the manual before installation
- Supervision should be provided when the DLB is used around children.
- Do not install or use the DLB box near flammable, explosive, irritating or combustible materials, chemicals or vapors.
- Use the DLB only within the specified range of operation parameters.
- Do not spray water or any other liquid directly on the DLB box.
- If the DLB box is defective, broken, worn, damaged or otherwise malfunctioning, or cannot operate or continues to operate, please stop using the DLB box.
- Do not attempt to disassemble, repair, tamper with or modify the DLB box.
- Do not apply strong force or impact to the DLB box, or apply tension, twist, tangle, drag or step on the DLB box to prevent damage to it or any of its components.
- Do not touch the terminals of DLB box with sharp metal objects.

6. DLB Box Description



7. Installation

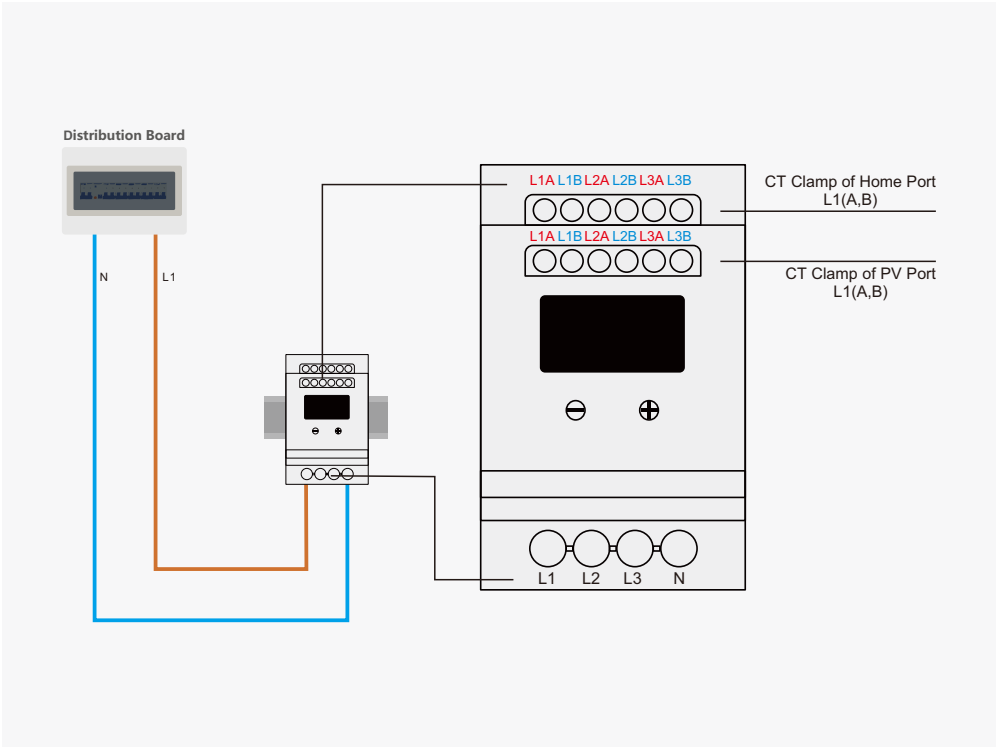
Please note that the household main cable mentioned in all installation steps means the cable include some or all of home applications and also ev charger.

Step 1: Install the voltage acquisition cable

Note: The DLB is powered by ev charger through a network cable

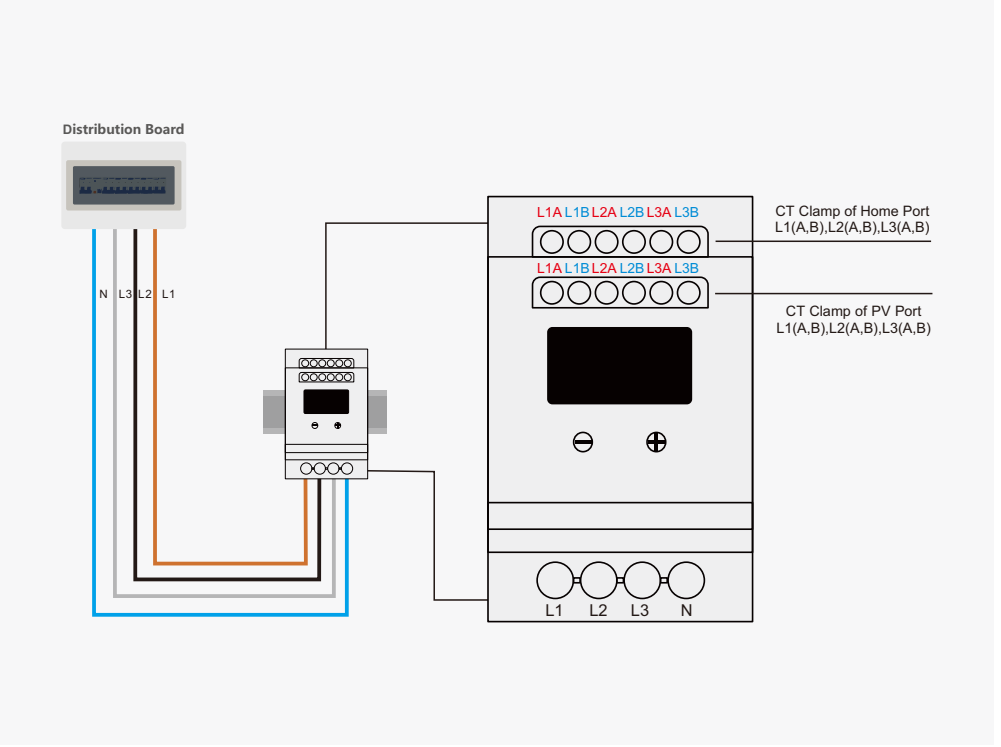
For single-phase DLB system:

- Connect the live wire L1 of the household main cable with the voltage measuring port L1 with the voltage acquisition cable.
- Connect the neutral wire N of the household main cable with the voltage measuring port N with the voltage acquisition cable.



For three-phase DLB system:

- Connect the live wires L1, L2 and L3 of the household main cable with the voltage measuring ports L1, L2 and L3 respectively with the voltage acquisition cable.
- Connect the neutral wire of the household main cable with the voltage measuring port with the voltage acquisition cable.



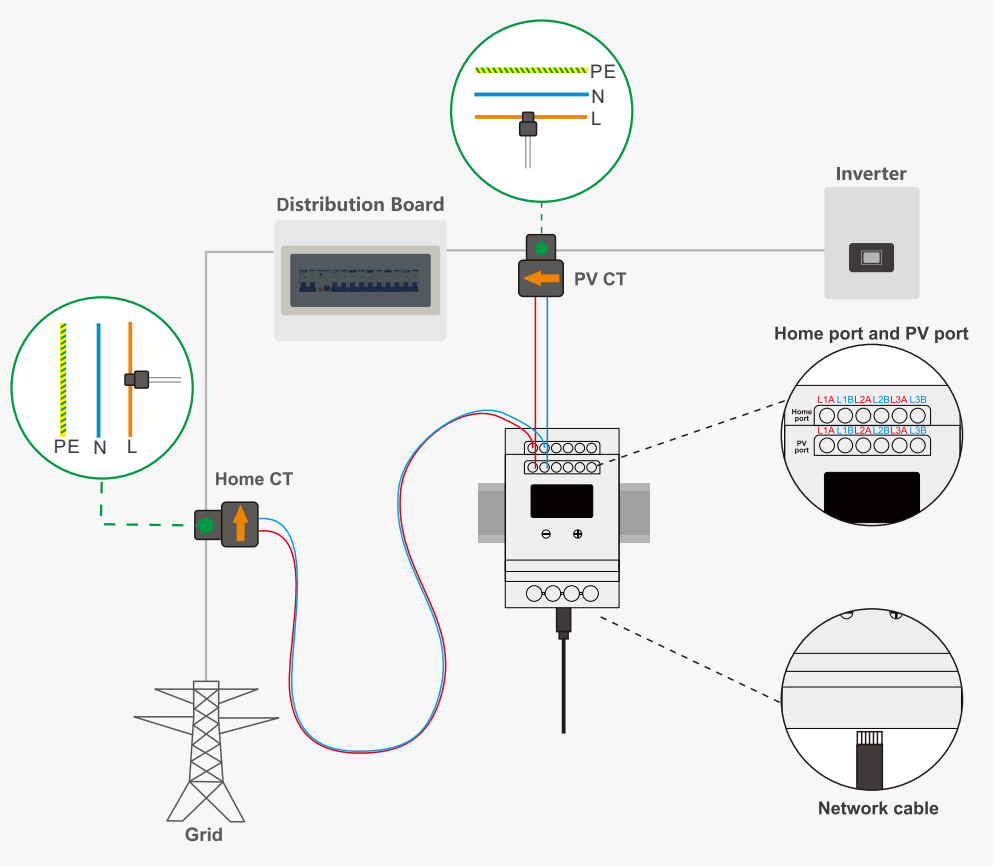
Step 2: Install the CT and cable

Note the arrow on CT before installation:
The arrow on CT means the current direction of the cable being measured.
Please ensure all CTs are installed in correct direction to make the system work.

For single-phase DLB system:

- Connect the CT clamp with the live wire L of the household main cable and connect the CT red wire to L1A on the DLB home port and the CT blue wire to L1B on the DLB home port.
- Connect the CT clamp with the PV cable L and connect the CT red wire to L1A on the DLB PV port and the CT blue wire to L1B on the DLB PV port.

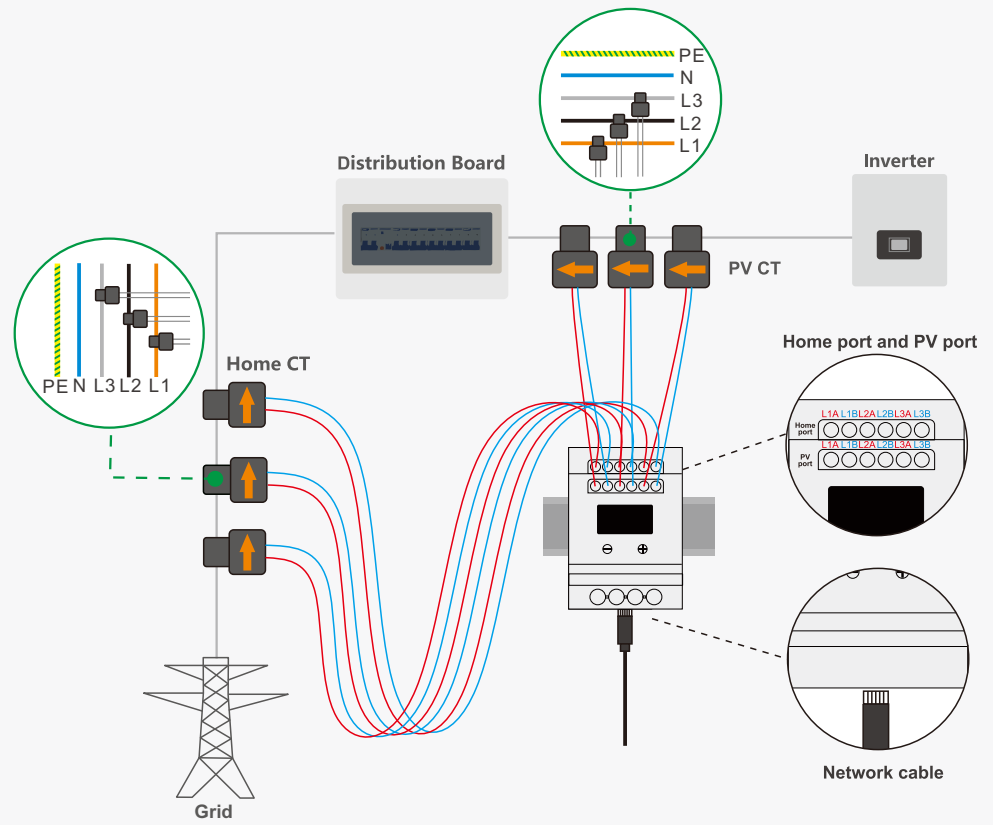
Note:
Skip the installation of CT clamp at PV side, if:
1.Your system doesn't have PV cable;
2.You don't need any PV data or function.



For three-phase DLB system:

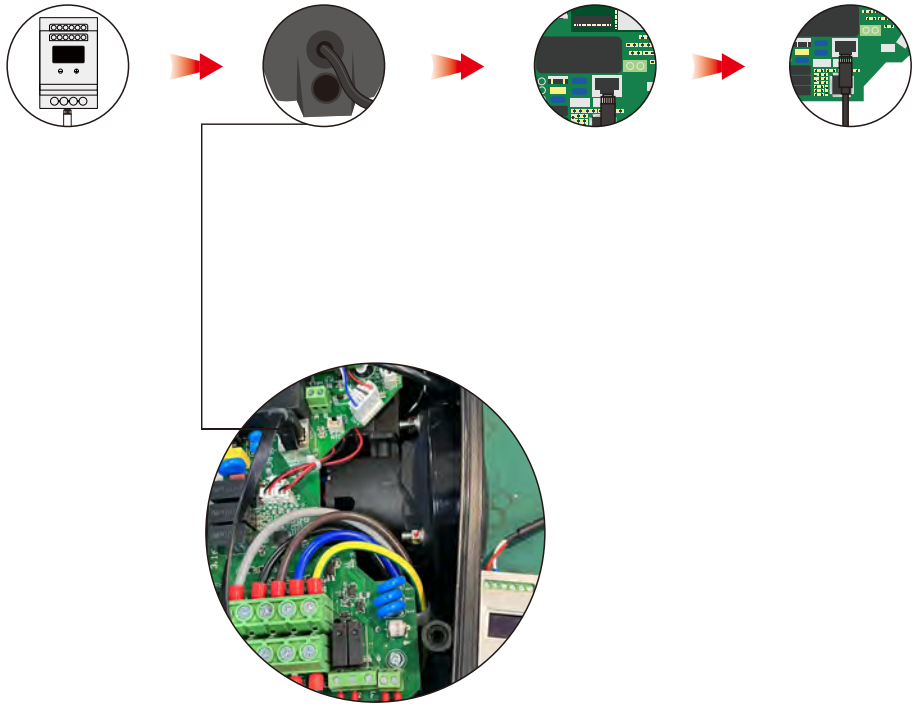
- Connect the CT clamps with the live wires L1, L2 and L3 of the household main cable and connect the CT red wires to L1A, L2A and L3A on the DLB home port and the CT blue wires to L1B, L2B and L3B on the DLB home port respectively.
- Connect the CT clamps with the PV cables L1, L2 and L3 and connect the CT red wires to L1A, L2A and L3A on the DLB PV port and the CT blue wires to L1B, L2B and L3B on the DLB PV port respectively.

Note:
Skip the installation of CT clamp at PV side, if:
1.Your system doesn't have PV cable;
2.You don't need any PV data or function.

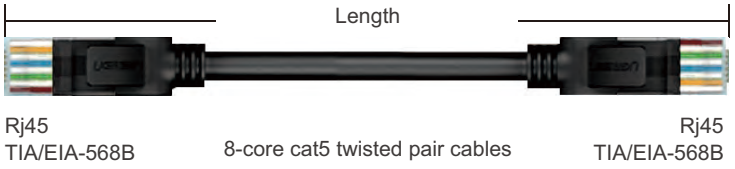


Step 3: Install the network cable

- Plug the RJ45 connector to DLB, and connect the network cable to the RJ45 port on PCB of charger.

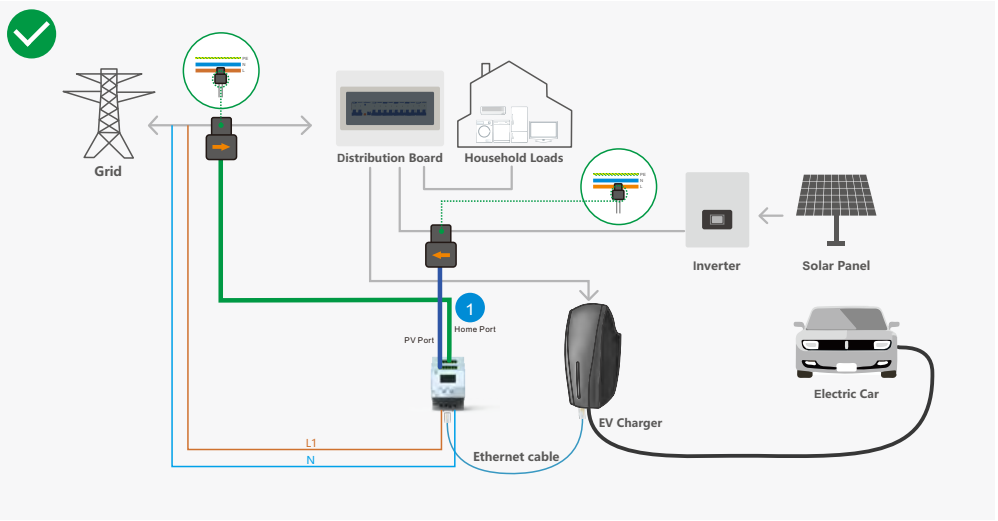


- Network Cable Recommended

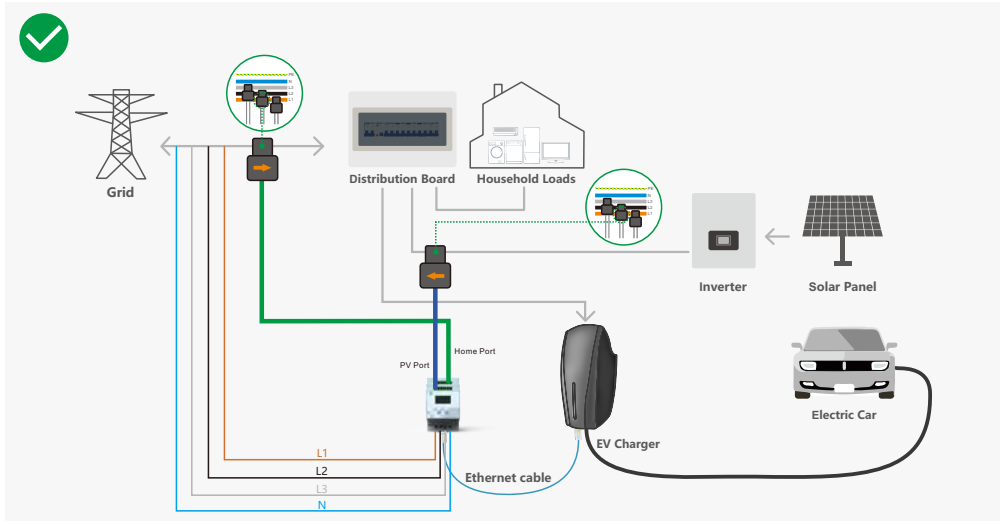


Step 4: Reference diagram

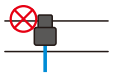
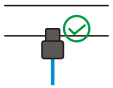
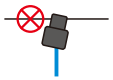
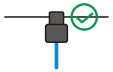
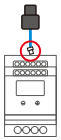
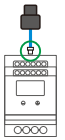
- For single-phase DLB system:



- For three-phase DLB system:



8. Troubleshooting

LED light status	Fault type	Potential Cause	Action
Yellow light on for 1s; Red light flashes 1 time The yellow light of the charger light board lights for 1s, then the red light flashes for one time, and this happened in turn.	DLB offline	 RS485 cable is damaged	 Replace Rs485 cable
		 Rs485 cable is not connected firmly	 Reconnect
Yellow light on for 1s; The red light flashes twice in a row The yellow light of the charger light board lights on for 1s,and then the red light flashes twice in succession.This happens in turn.	DLB current abnormal	 CT is clamped on the wrong power cord	 Check if the CT position is correct
		 CT open coil is not connected firmly	 Reconnect
		 The connection between the CT cable and the DLB is loose	 Reconnect
		The DLB box doesn't measure the charging current of EV charger, check whether the cable is connected.	Check if the CT position is correct