



BENY User and Installation Manual



VERSION: 20250521-01

ZHEJIANG BENYI NEW ENERGY CO.,LTD.

SHUANGHUANGLU INDUSTRIAL ZONE, BEIBAIXIANG TOWN, YUEQING CITY, WENZHOU CITY, ZHEJIANG PROVINCE, CHINA.

TEL: +86-577-5717 7008 FAX: +86-577-5717 7007

✉ info@evb.com

🌐 www.evb.com

♻️ This catalogue has been printed on ecological paper.

© Zhejiang Benyi New Energy Co., Ltd. All rights reserved.

⚠️ If the models and specifications in this product catalogue change due to product updates, we will not provide prior notification.

WWW.EVB.COM

BENY



G R E E N S M A R T

CONTENTS	
1. Introduction	01
1.1 Features and Functions	01
1.2 Parameter table	02
2. Working Mode Description	03
3. Introduction to Mode Setting	04
3.1 How to set pure PV mode, hybrid mode and full speed mode	04
3.2 How to switch between Grid mode and PV mode	05
3.3 How to set the overload value for the distribution board in Grid mode	06
4. Accessories	08
5. Safety Precautions	09
6. DLB Box Description	10
7. Installation Instructions	11
7.1 Installation of single-phase DLB system	11
7.2 Installation of three-phase DLB system	15
8. Troubleshooting	20

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.

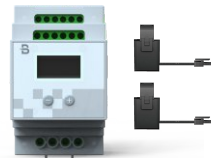
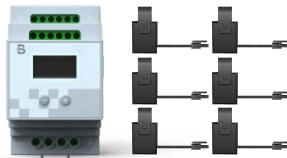
DLB in Grid Mode: Automatically adjust the power of EV charger to avoid over-load of home line.
DLB in PV Mode: Optimize the PV power using with EV charger.

1.1.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)

1.2.Parameter table

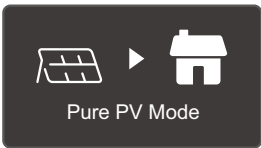
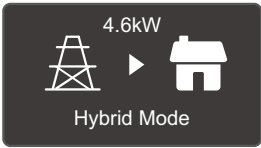
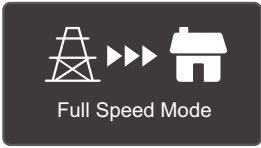
		
Model	BCP-DLB-01M/ BCP-DLB-11M	BCP-DLB-03M/ BCP-DLB-13M
Phase	Single Phase	Three Phase
Operating Mode	PV	PV
Extreme Mode	✓	✓
Night Automatic Full Speed Mode	✓	✓
Mode switch	✓	✓
Number of Current Transformers	1/2	3/6
Rated input voltage	12V	
Standby/working power consumption	<1W	
Working temperature	-30°C~55°C	
Storage temperature	-40°C~80°C	
Working humidity	5%-95%	
Maximum detection current	100A	
Maximum detection voltage	230±10%	
Display	OLED	
Distance between DLB box and EV charger support	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)	
Dimensions	54.8mm*99.6mm*66mm	
Weight (The CT clip is not included)	0.163kg	

2. Working Mode Description

Grid Mode:

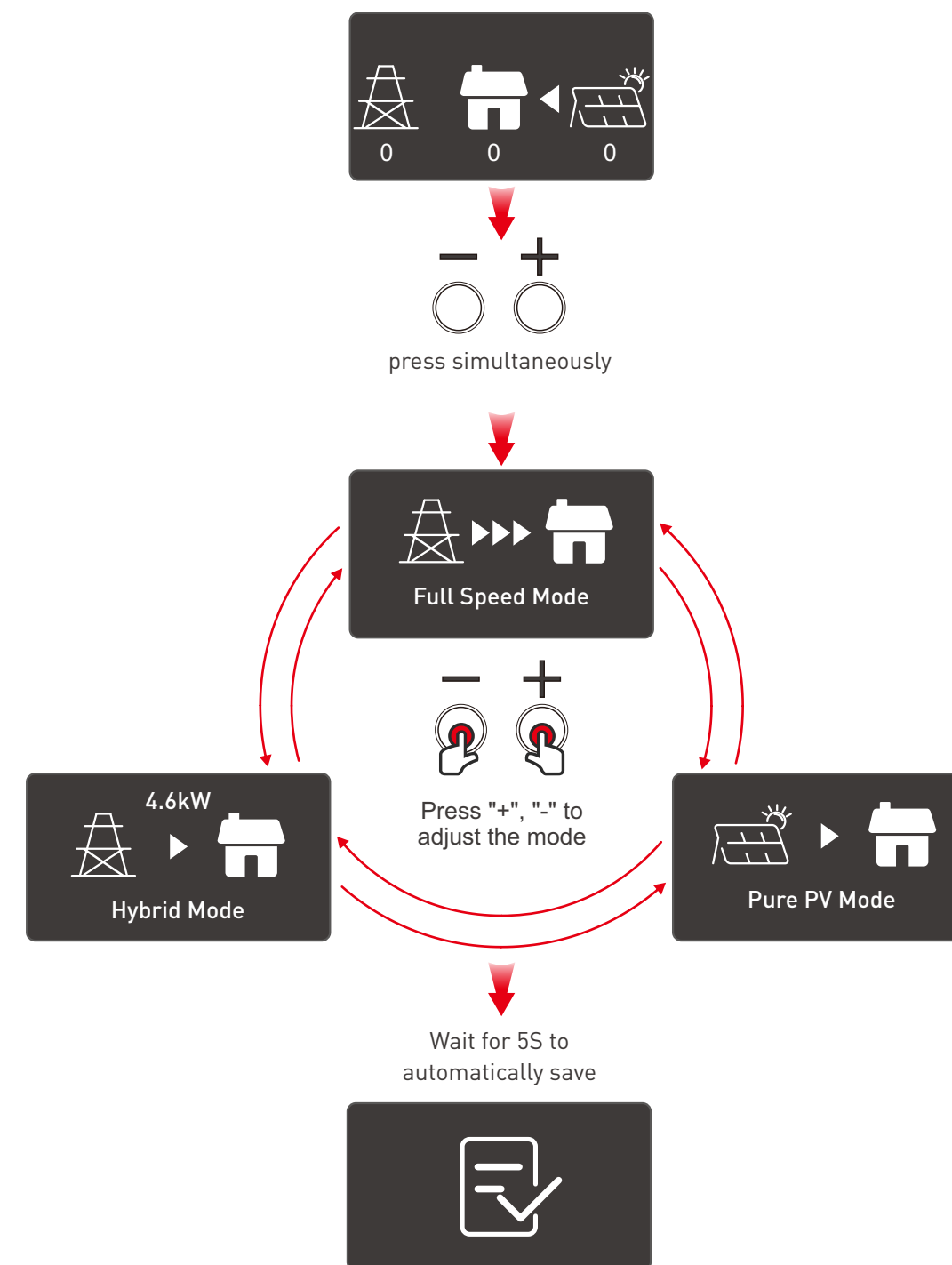
After set the over-load value via DLB box or APP according to the fuse of main line, the Grid mode DLB will limit the charger and home applications work below the value and protect the house circuit from over-load.

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.

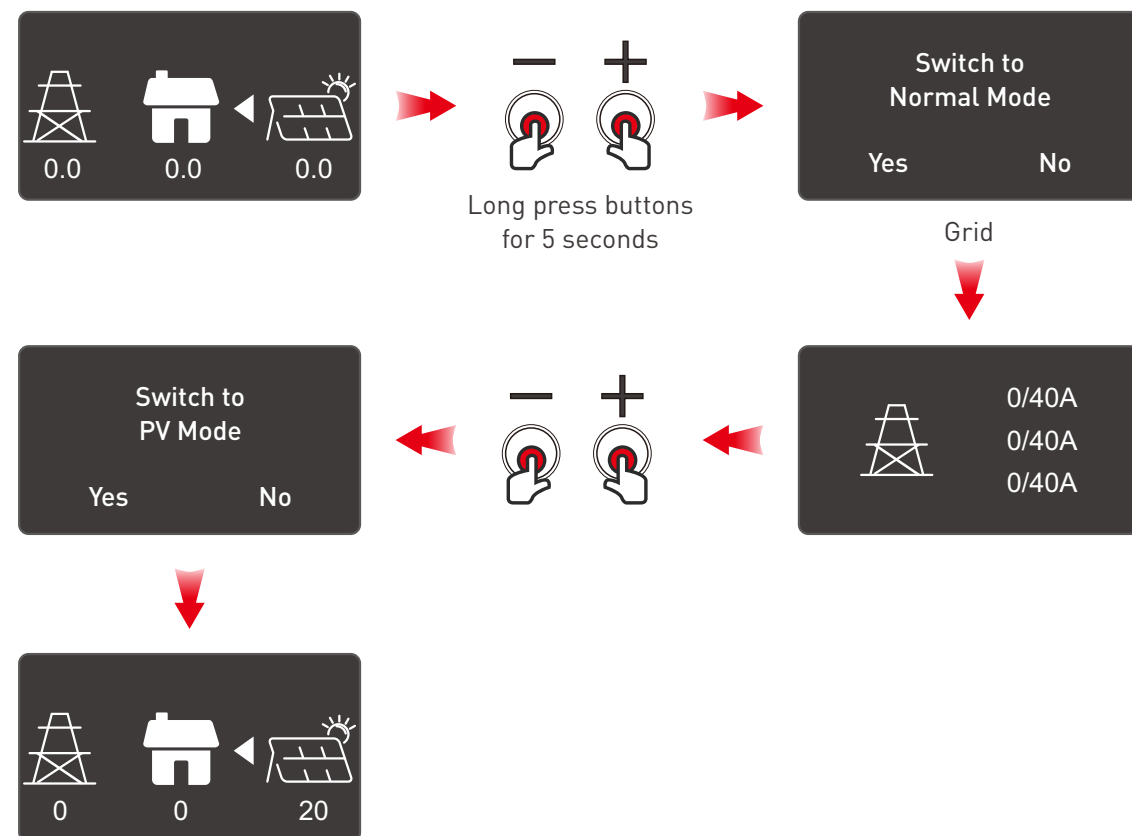
Pure PV Mode 	DLB solution measures and manages the energy flow of house, prevents PV energy from flowing to the grid. In the case of PV power overflow, DLB will increase the power to charger and the charger consumes the overflown power. Once the PV power decreases and the grid power starts to flow into 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

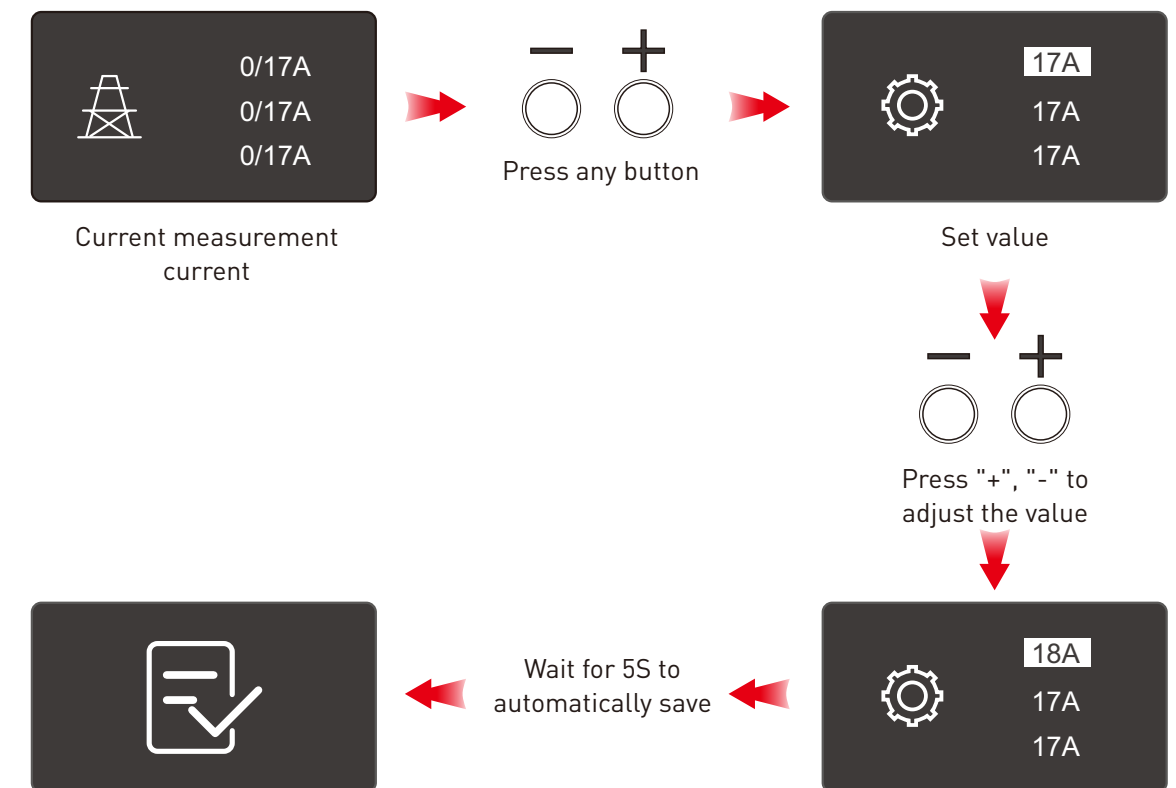


3.2.How to switch between Grid mode and PV mode

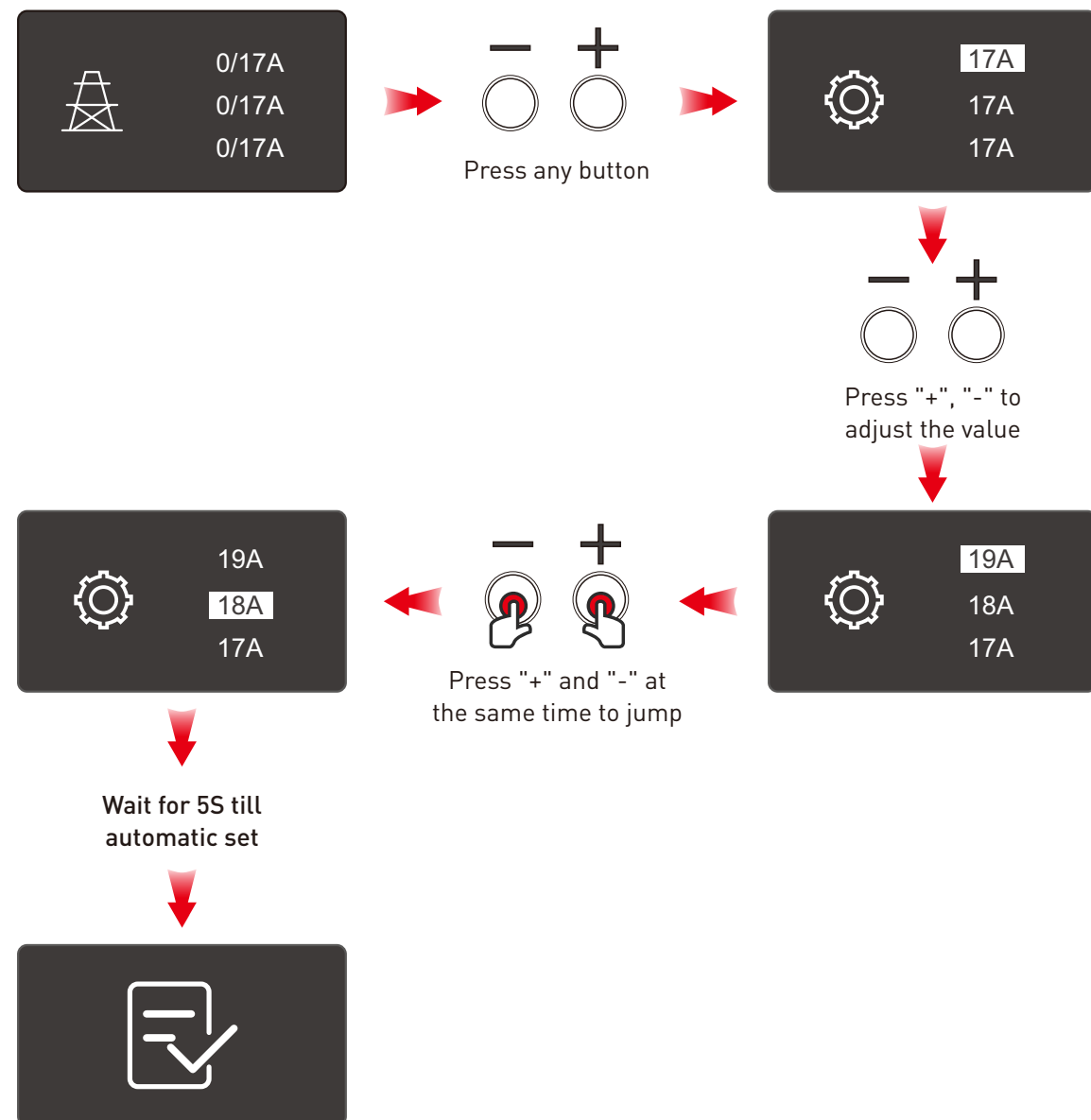


3.3.How to set the overload value for the distribution board in Grid mode

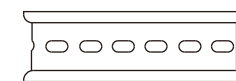
- For 1 Phase DLB box



- For 3 Phase DLB box

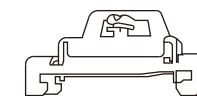


4. Accessories



Din rail 105mm

X1



Din rail fixing parts

X2



M4*30 expansion screw kit

X2



Current Transformer
(1-phase 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.



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.

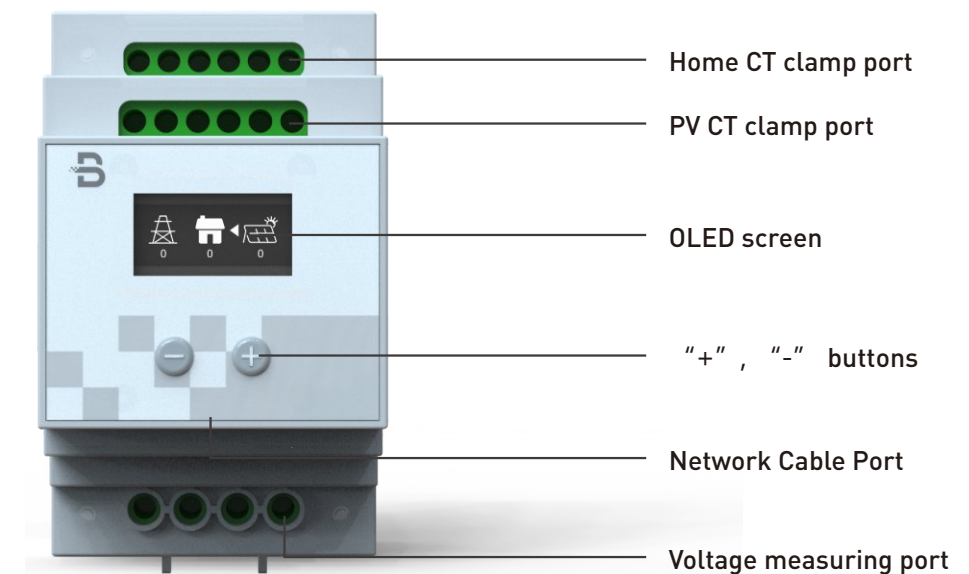


Do not touch the terminals of DLB box with sharp metal objects.

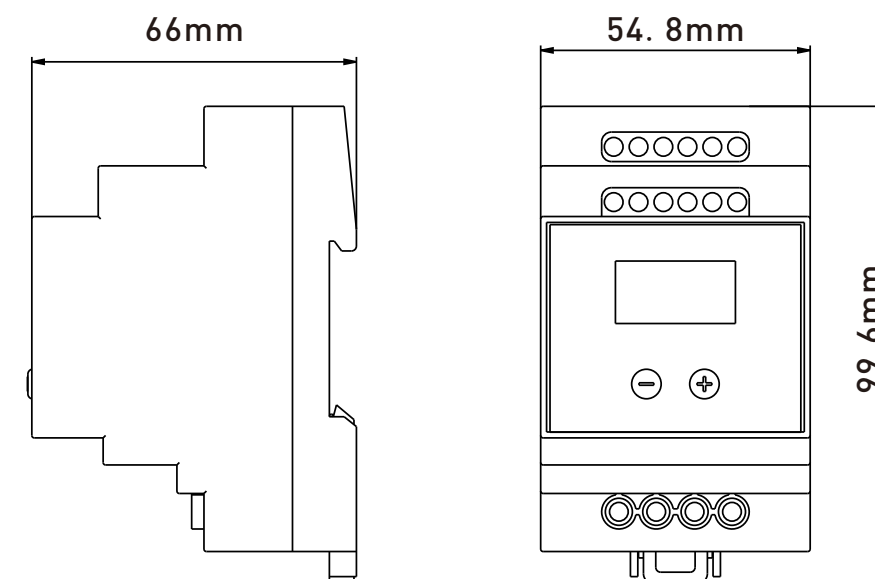


Read the manual before installation.

6. DLB Box Description



Dimensions of DLB

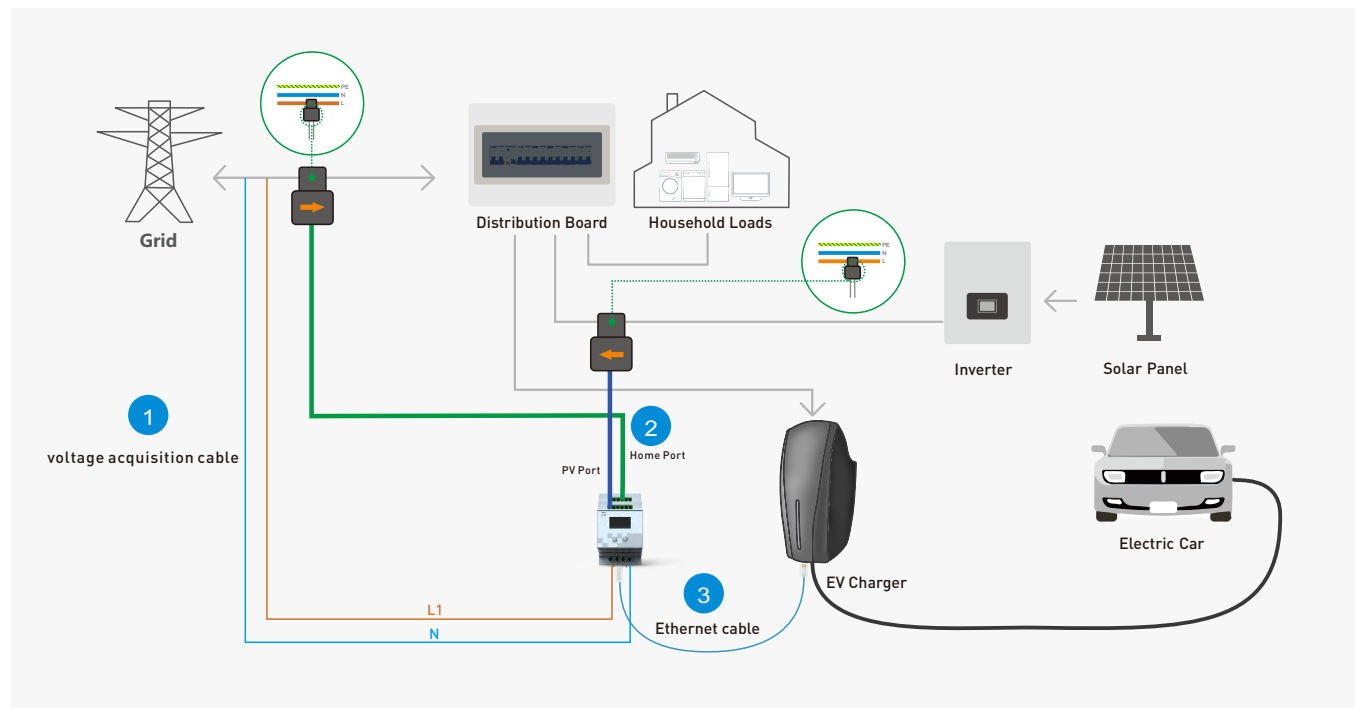


7. Installation

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.

7.1.Installation of single-phase DLB system

7.1.1.Single-phase DLB system - installation diagram

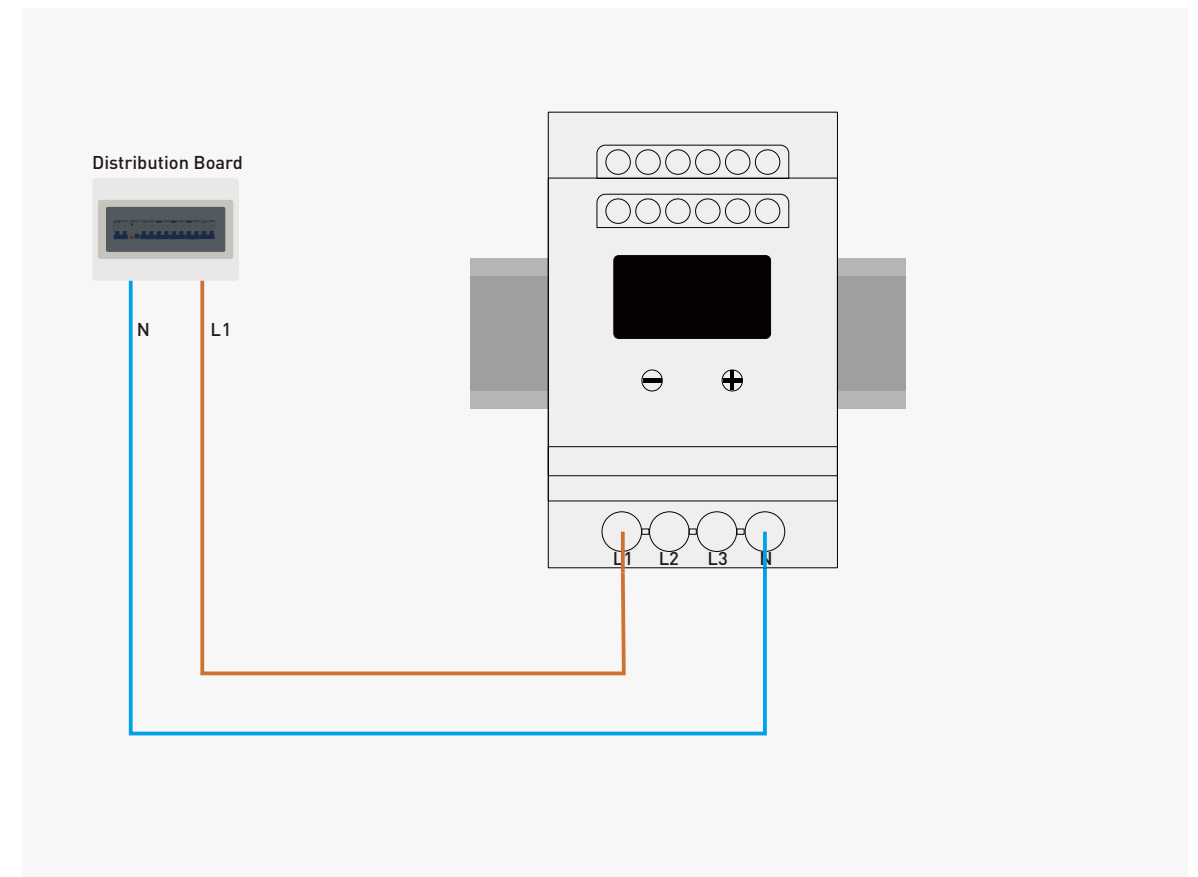


The installation of a single-phase DLB system is divided into three steps:

- 1.Install the voltage acquisition cable;
- 2.Install the CT clamp;
- 3.Connect the DLB and the EV Charger with a Ethernet cable.

7.1.2.Install the voltage acquisition cable

- 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.



7.1.3.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.

A total of two CT clamps are required: one for the grid side and the other for the PV side.

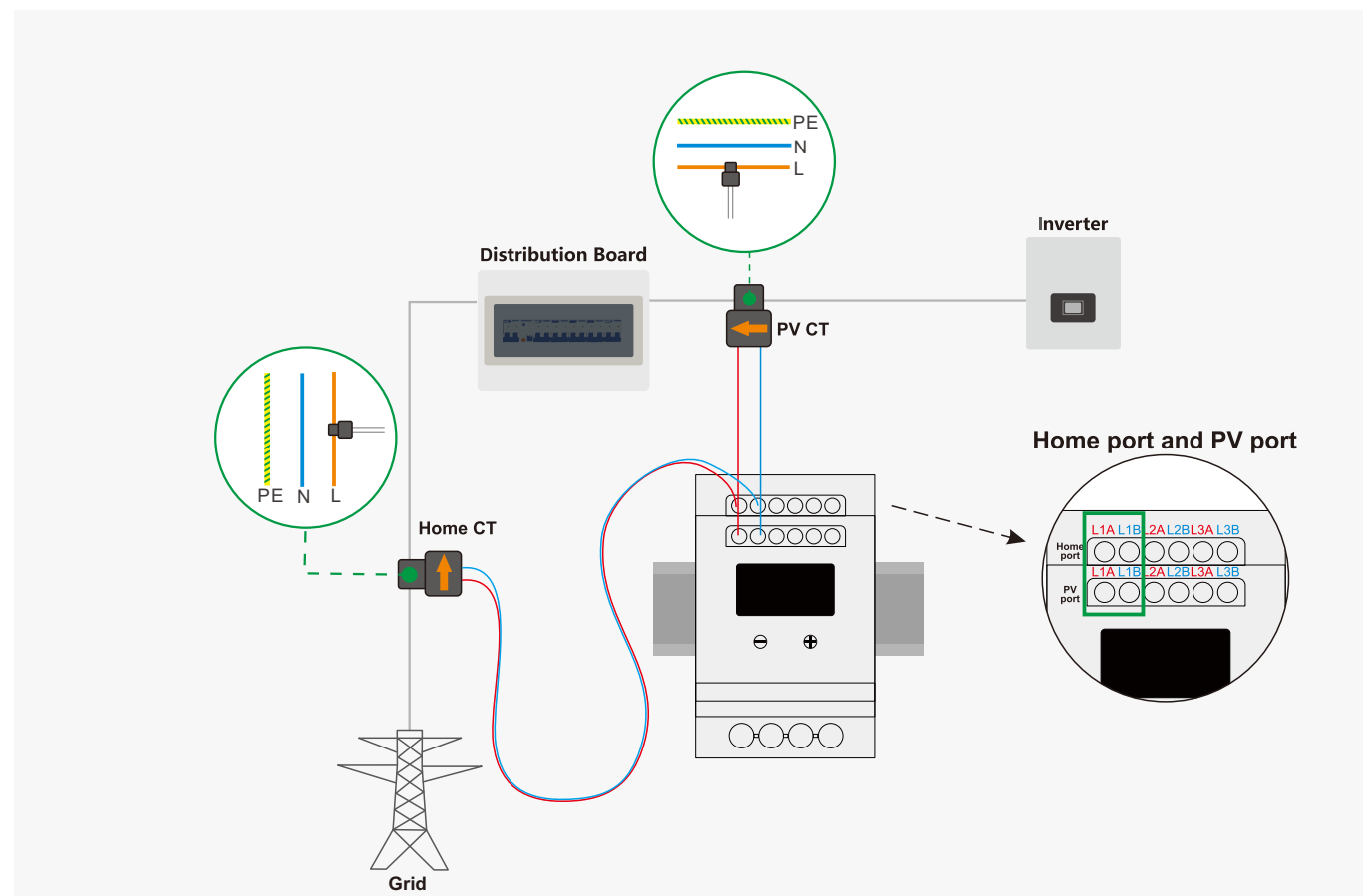


Note:

Skip the installation of CT clamp at PV side, if:

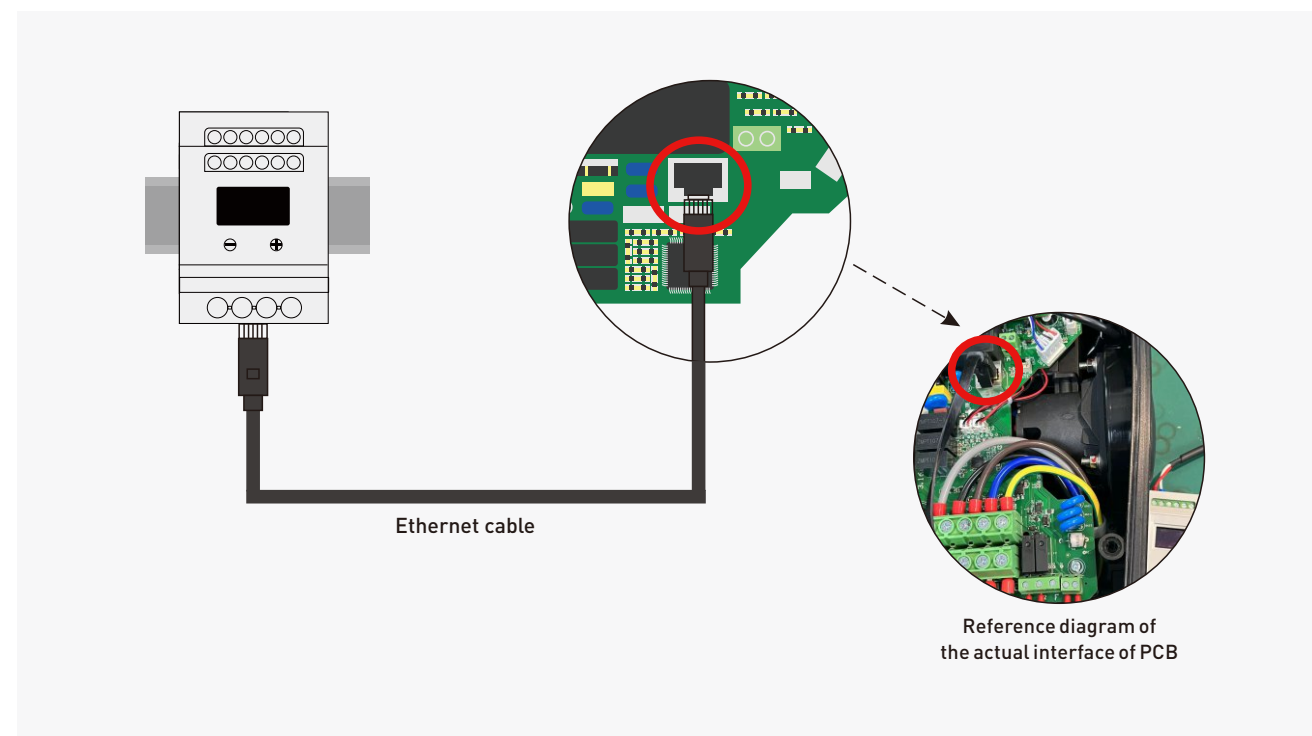
1. Your system doesn't have PV cable;
2. You don't need any PV data or function.

- Home CT: 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.
- PV CT : 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.

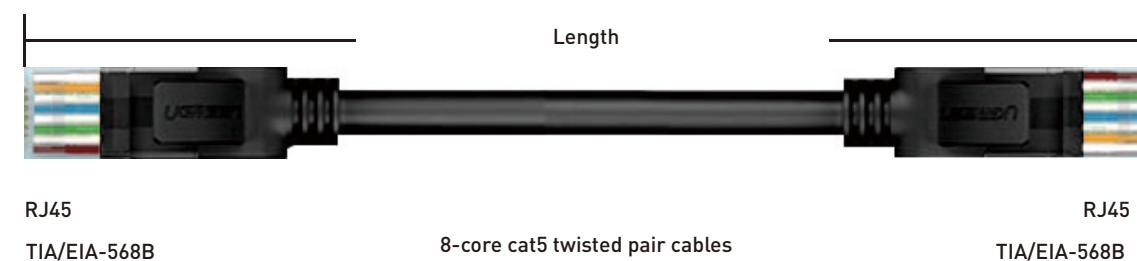


7.1.4. Install the Ethernet cable

- Insert one end of the ethernet cable into the RJ45 port of the DLB, and the other end into the RJ45 port on the PCB of the charger.

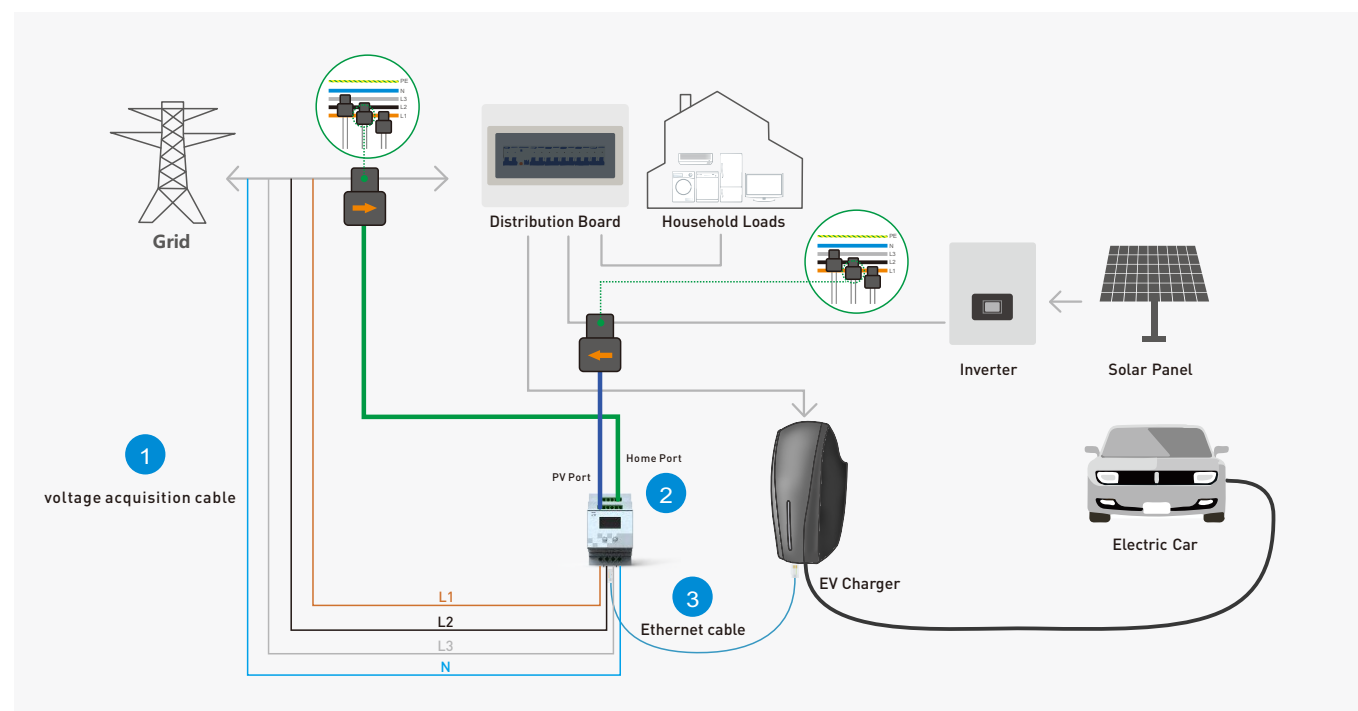


- Ethernet cable Recommended



7.2.Installation of three-phase DLB system

7.2.1.Three-phase DLB system - installation diagram

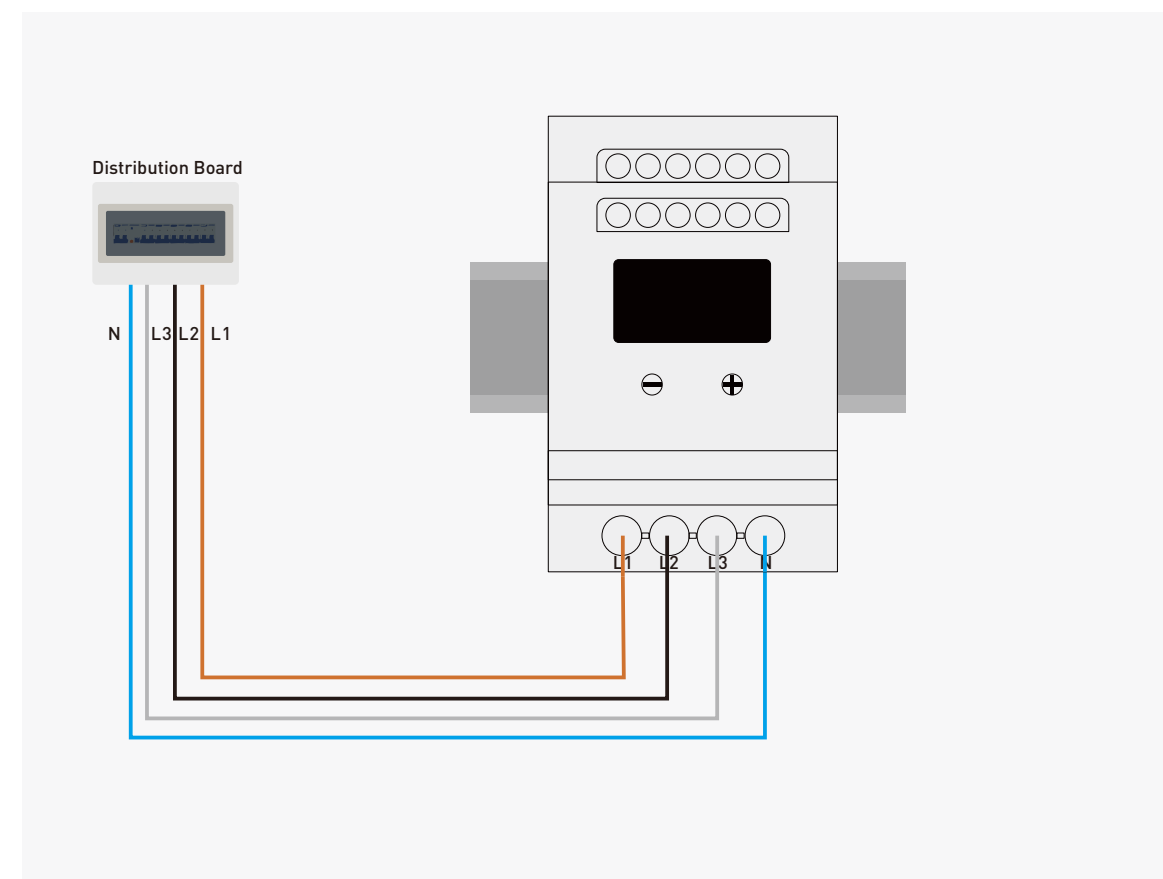


The installation of a three-phase DLB system is divided into three steps:

- 1.Install the voltage acquisition cable;
- 2.Install the CT clamp;
- 3.Connect the DLB and the EV Charger with a Ethernet cable.

7.2.2.Install the voltage acquisition cable

- 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 N of the household main cable with the voltage measuring port N with the voltage acquisition cable.



7.2.3.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.

A total of six CT clamps are required, three for the grid side and the other three for the PV side.



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.

- Home CT: 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.

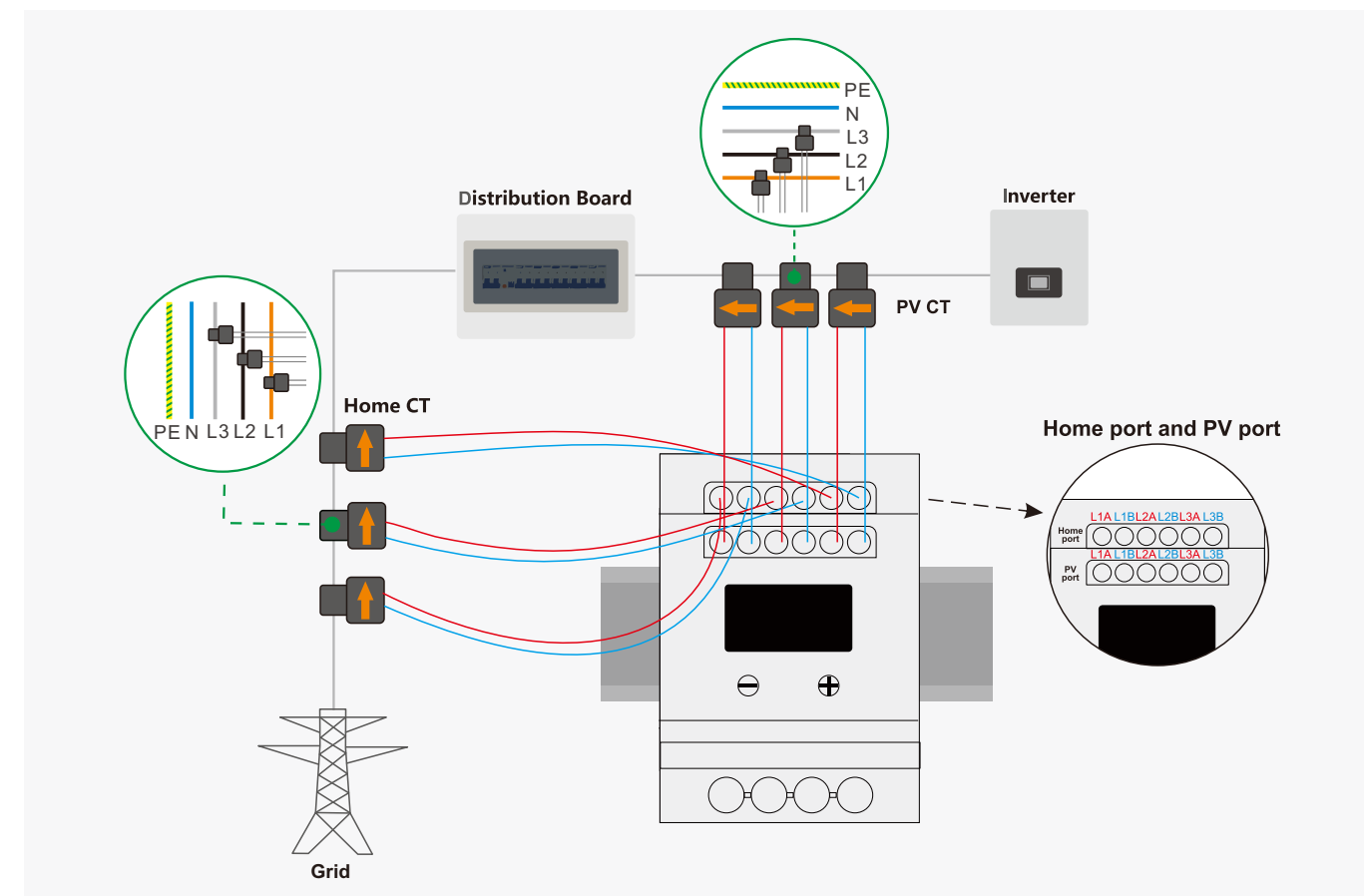
Home CT			
NO.	Position (household main cable)	Red wire	Blue wire
1	L1	L1A (Home port)	L1B (Home port)
2	L2	L2A (Home port)	L2B (Home port)
3	L3	L3A (Home port)	L3B (Home port)

In the table, L1A, L2A, L3A, L1B, L2B, and L3B refer to the corresponding port of the DLB home port.

- PV port: 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.

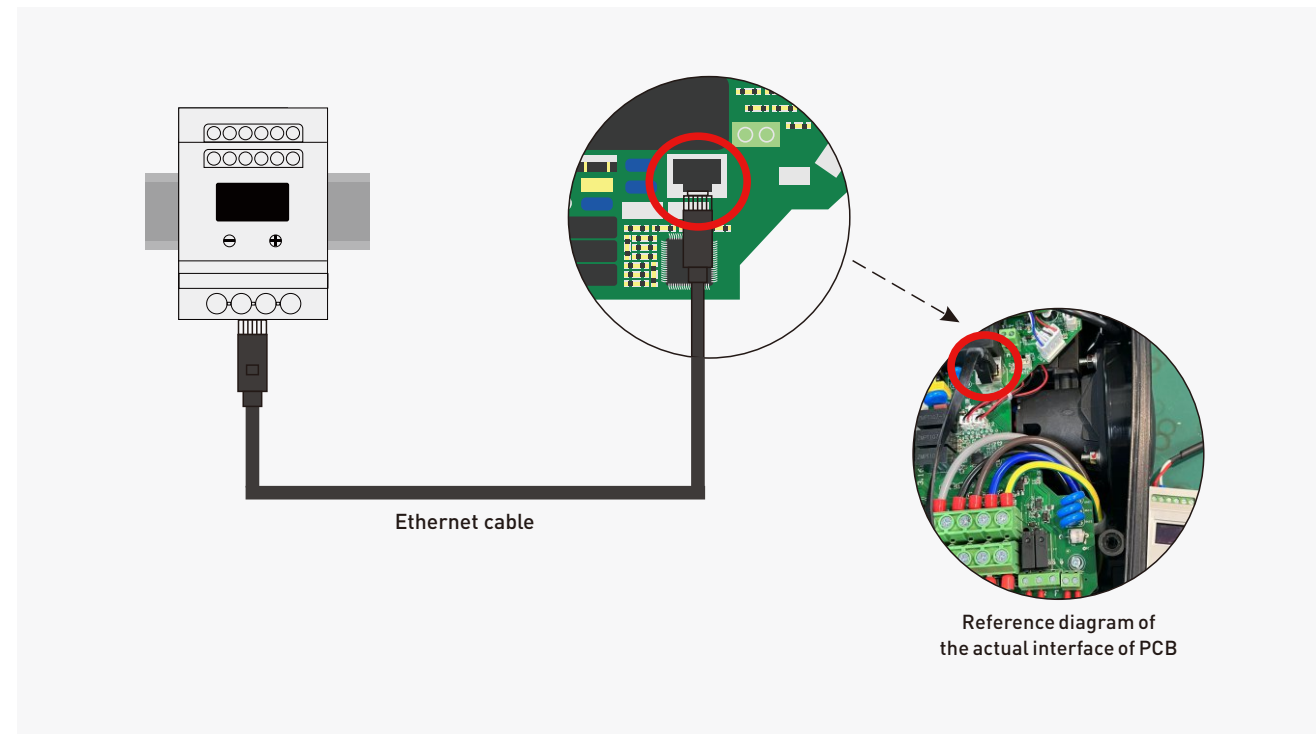
PV CT			
NO.	Position (PV cable)	Red wire	Blue wire
1	L1	L1A (PV port)	L1B (PV port)
2	L2	L2A (PV port)	L2B (PV port)
3	L3	L3A (PV port)	L3B (PV port)

In the table, L1A, L2A, L3A, L1B, L2B, and L3B refer to the corresponding port of the DLB PV port.

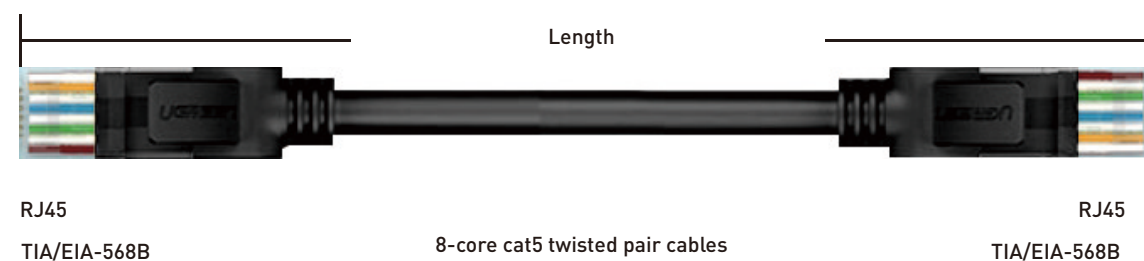


7.2.4. Install the Ethernet cable

- Insert one end of the ethernet cable into the RJ45 port of the DLB, and the other end into the RJ45 port on the PCB of the charger.



- Ethernet cable Recommended



8. Troubleshooting

LED light status	Fault type	Potential Cause	Action
</			