
Wallbox Series



User Manual

EV-AC1P-7K

EV-AC1S-7K

EV-AC3P-11K

EV-AC3S-11K

EV-AC3P-22K

EV-AC3S-22K

RENAC

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1. Introduction

1.1 Introduction

This manual describes Wallbox :

EV-AC1P-7K/EV-AC1S-7K/EV-AC3P-11K/EV-AC3S-11K/EV-AC3P-22K/EV-AC3S-22K

Please read the safety instructions in this manual first. The manual assumes that the reader is familiar with AC and DC installations and knows the rules and regulations for electrical equipment and connecting it to the utility AC grid. Being familiar with the general safety rules for working with electrical equipment is especially important.

1.2 Explanation of symbols

Throughout the manual important information is shown at different levels depending on the character of the information, as shown here:







	Safety information is important for human safety. Violation of warnings may result in injury to persons or death.
	Danger of high voltage and electric shock!
	Product should not be disposed as normal household waste.
	CE Mark
	Information important for the protection of property. Violation of this type of information may cause damage and loss of property.
	Useful additional information or "Tips and Tricks" on specific subjects.

Table 1-1 Explanation of symbols

2. Technical description of EV charger

2.1 Mechanical design

Figure 2-1 shows the outline demensions of EV-AC1P-7K//EV-AC3P-11K//EV-AC3P-22K:

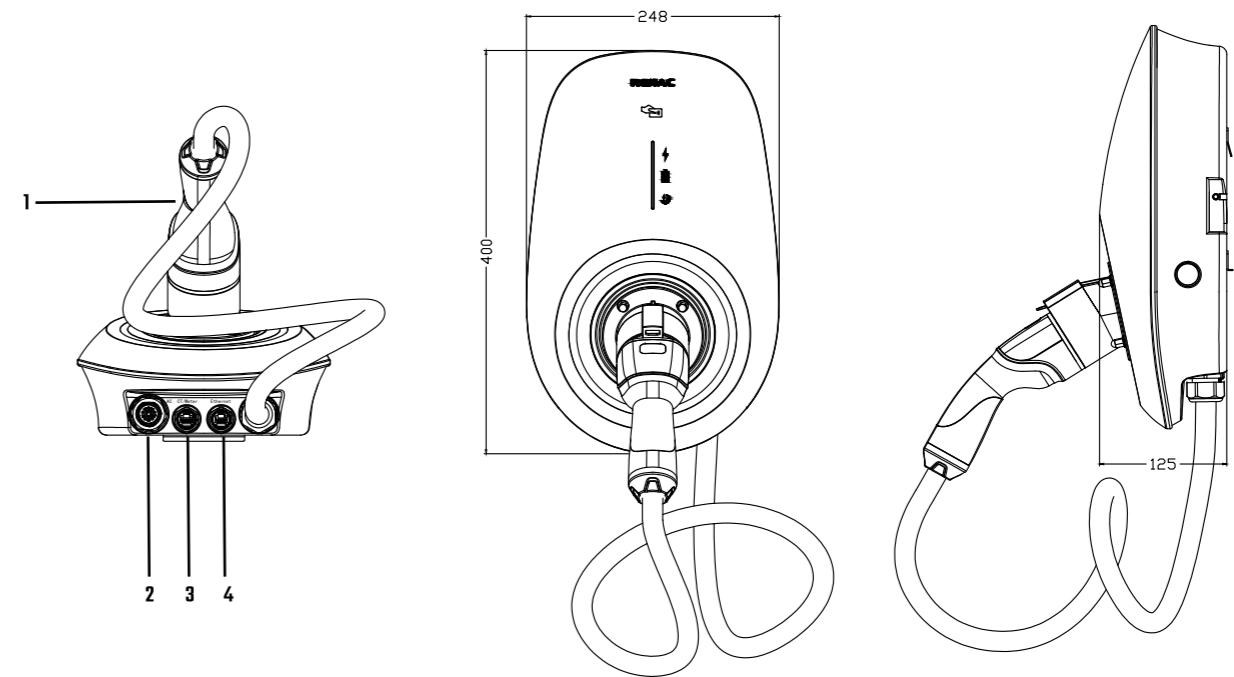


Figure 2-1 Plug version

1	Charging Gun	2	AC terminal
3	CT/Meter port	4	Ethernet port

Table 2-1

Figure 2-2 shows the outline demensions of EV-AC1S-7K//EV-AC3S-11K//EV-AC3S-22K:

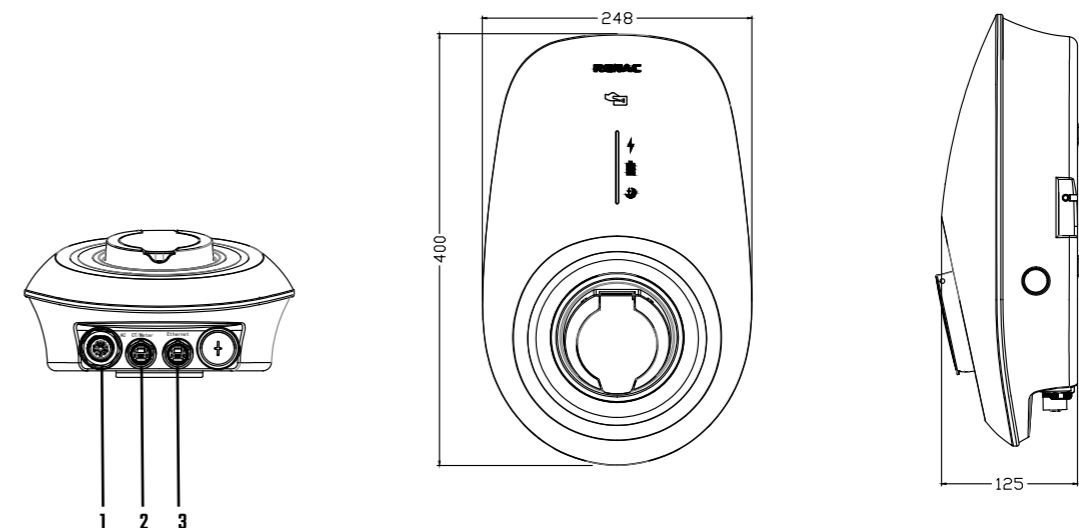


Figure 2-2 Socket version

1	AC terminal	2	CT/Meter port
3	Ethernet port		

Table 2-2

2.2 Technical data

Model	EV-AC1P-7K	EV-AC1S-7K	EV-AC3P-11K	EV-AC3S-11K	EV-AC3P-22K	EV-AC3S-22K
AC Input & Output Data						
Phase / Lines	Single Phase / L + N + PE		Three Phase / 3 + N + PE		Three Phase / 3 + N + PE	
Rated AC Input Voltage [V]	230		400		400	
Grid Frequency [Hz]			50 / 60			
Rated AC Output Voltage [V]	230		400		400	
Rated AC Output Power [W]	7000		11000		22000	
Max. AC Output Current [A]	32		16		32	
Charging interface type	IEC 62196-2, Type 2					
Connection	Plug	Socket	Plug	Socket	Plug	Socket
Cable Length [m]	5 / 7	/	5 / 7	/	5 / 7	/
Interface						
Ethernet	Optional (OCPP1.6)					
RS485	Yes					
Wifi, Bluetooth and RFID	Optional					
CT Clamps	Yes					
Meter	Optional					
Protection						
AC Overvoltage Protection	Integrated					
AC Undervoltage Protection	Integrated					
AC Overcurrent Protection	Integrated					
Surge Protection	Integrated					
Grounding Protection	Integrated					
Current leakage Protection	Integrated					
Over Temperature Protection	Integrated					
RCD	Type A + 6mA DC fault current protection (Equivalent to Type B)					
General Data						
Size (Width * Height * Depth) [mm]	248 * 400 * 135					
Weight [kg]	3.92	2.36	5.0	2.6	5.0	2.6
Ambient Temperature Range [C]	-20 ~ +50					
Relative Humidity	0 ~ 95%					
Operating Altitude [m]	≤ 2000					
Cooling	Natural					
Protection Grades	IP65	IP54	IP65	IP54	IP65	IP54
Certifications & Standards						
Safety Regulation	CE					

Table 2-3 Technical data

3. Installation and startup

3.1 Package information

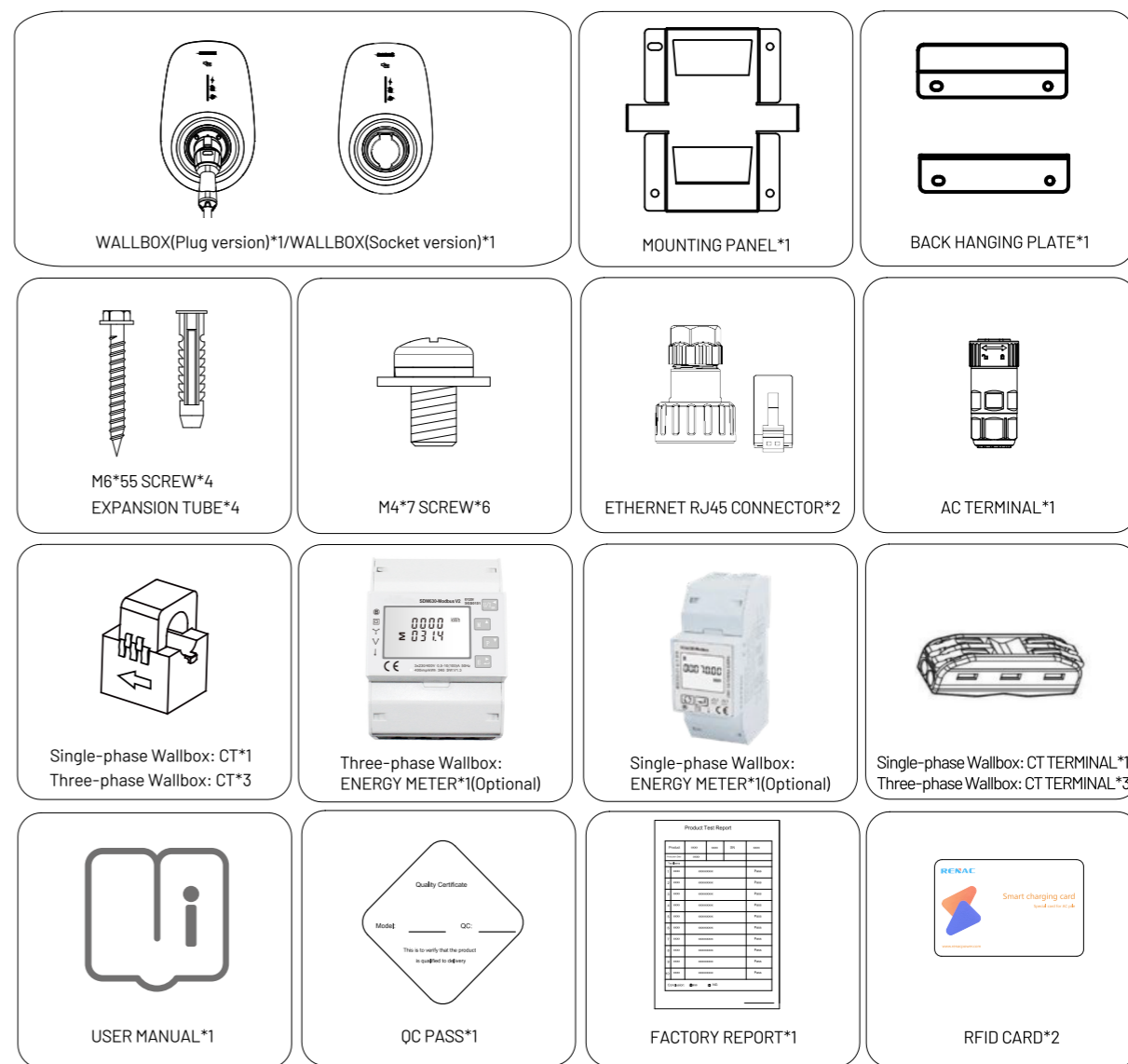


Figure 3-1 Package information

3.2 Installation environment

- 1) In order to achieve optimal performance, the ambient temperature should be kept lower than 45 °C.
- 2) For the convenience of checking the LCD display and possible maintenance activities, please install the charger at eye level.
- 3) Wallbox should not be installed near flammable or explosive items. Any robust electromagnetic equipment should be kept away from the installation site.
- 4) The product label and warning symbol shall be clear to read after installation.
- 5) Please do not install wallboxes under direct sunlight, rain, and snow.

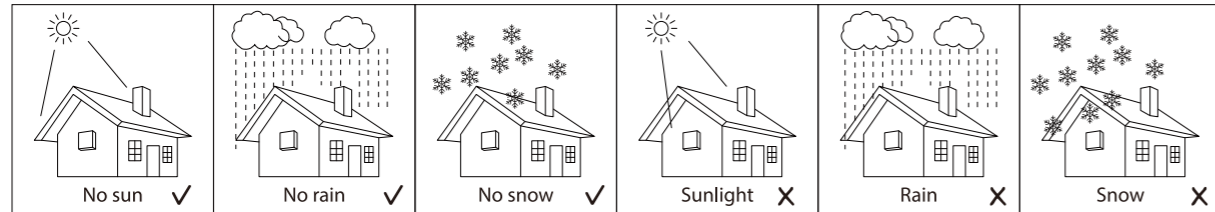


Figure 3-2 Installation environment

3.3 Installation position

The following installation is based on the wallbox with gun version.

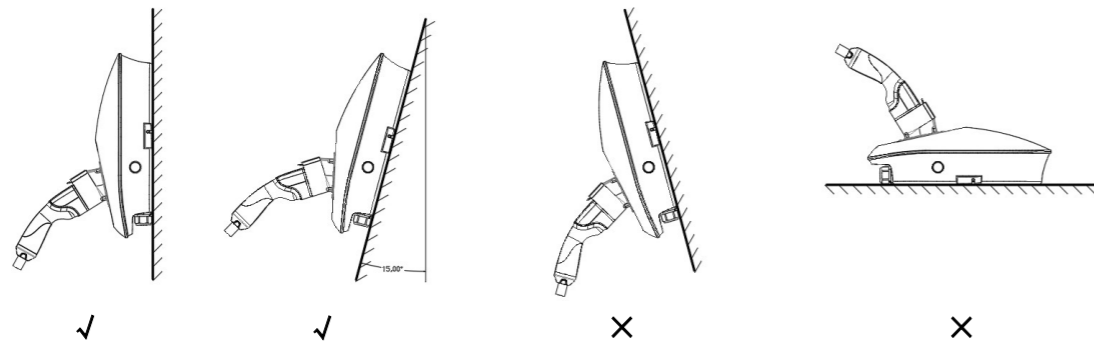


Figure 3-3 Installation position



WARNING!

- 1) The installation method and mounting location must suit the wallbox weight and dimensions.
- 2) Mount on a solid surface.
- 3) Select a well-ventilated place sheltered from direct sun radiation.

Considering heat dissipation and convenient dismantlement, the minimum clearances around the charger should be no less than the following value.

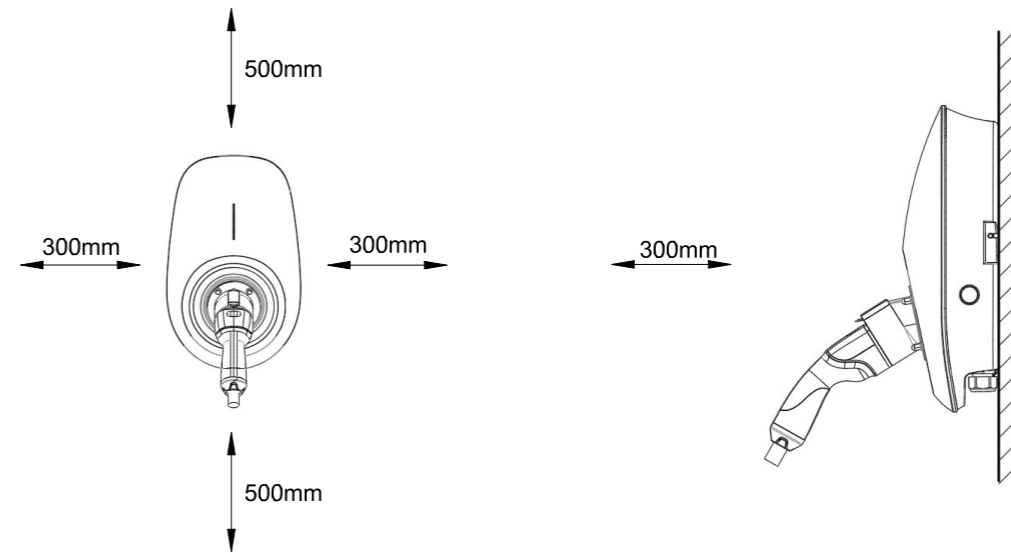


Figure 3-4 Distance required of wallbox

3.4 Installation steps

Step 1: Drill 4 Fix Ø 10 holes in the wall according to the dimensions.

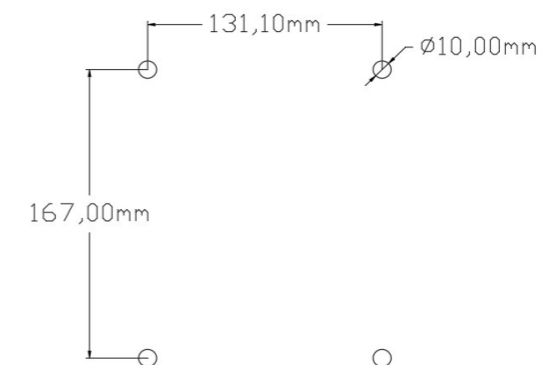
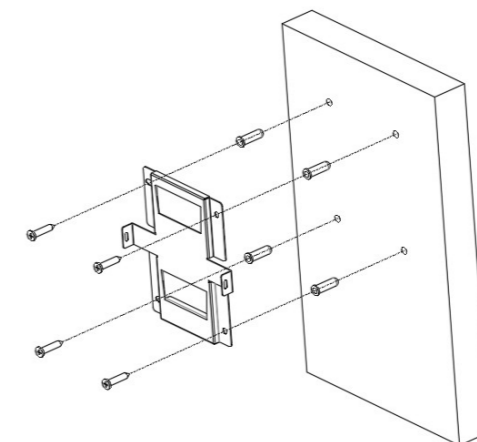


Figure 3-5 Wall mounting

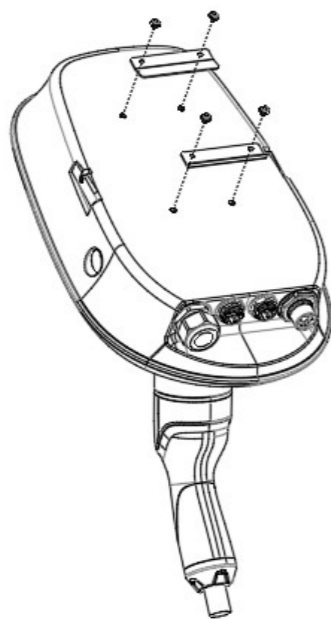
Step 2: Fix the wall mounting bracket on the wall with 4 expansion bolts in accessory bag.



C
Recommended torque: 4N·m

Figure 3-6 Wall mount bracket

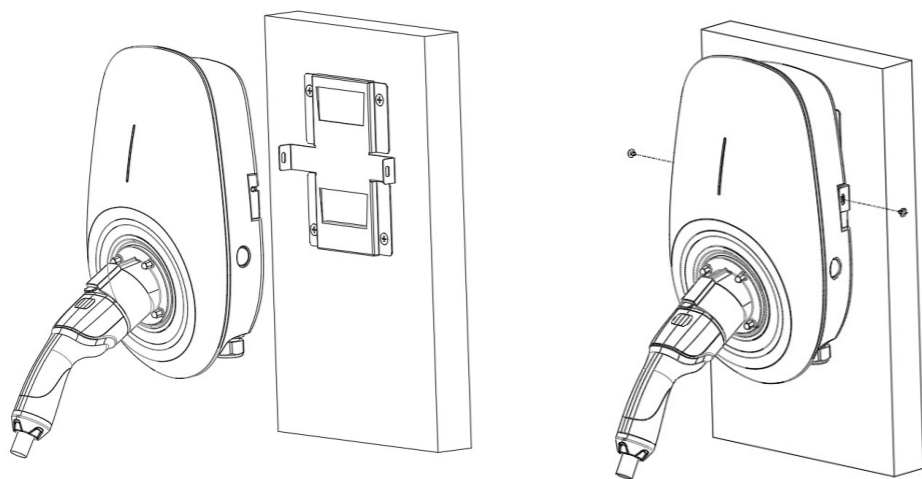
Step 3: Fix the bracket to the back of the charging station using the 4 screws in the accessory bag.



C
Recommended torque 1.3N·m

Figure 3-7 Wallbox bracket

Step 4: Place the wallbox on the wall-mounted bracket and install the fix screw.



C
Recommended torque 1.3N·m

Figure 3-8 Install screw

3.5 Electrical connection

3.5.1 Precautions for connecting the grid (AC output)



WARNING!

- 1) Add a breaker or fuse to the AC side. The specification should be more than 1.25 times of rated AC output current.
- 2) The PE line of wallbox should be connected to the earth. Make sure the impedance of neutral wire and earth wire is less than 10 ohms.



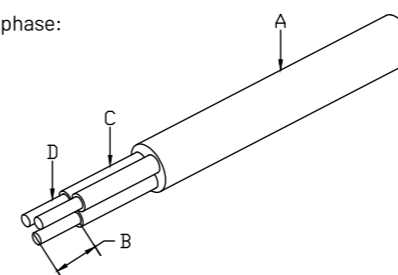
WARNING!

- 3) Disconnect the breaker or fuse between the charger and the utility.
- 4) All chargers incorporate a certified internal Residual Current Device (RCD) in order to protect against possible electrocution and fire hazard in case of a malfunction in the PV array, cables, or charger. There are two trip thresholds for the RCD as required for certification (IEC 62109-2:2011). The default value for electrocution protection is 30mA, and for slow-rising current is 300mA.

3.5.2 Single/Three AC terminal connection program

1.Strip off L/N/PE cables as Figure 3-9:

Single-phase:



Three-phase:

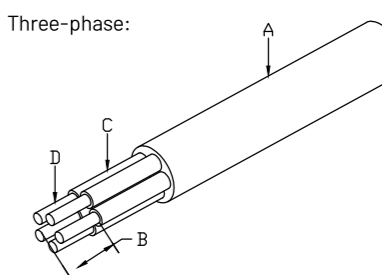


Figure 3-9 Strip off PE/N/L cables

No.	Description	Remark
A	Protective layer	Diameter ranges : 9-16mm
B	Length of stripped off	12mm
C	Insulate layer	50mm
D	Cross section of ac cables	6mm ² of copper wire

Table 3-1

2. Lead the AC cable through the cable gland and the housing.

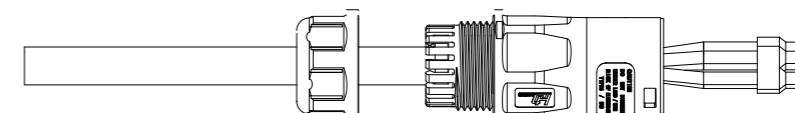


Figure 3-10

3. Remove the cable jacket by 40 mm, and strip the wire insulation by 8 mm-15 mm.

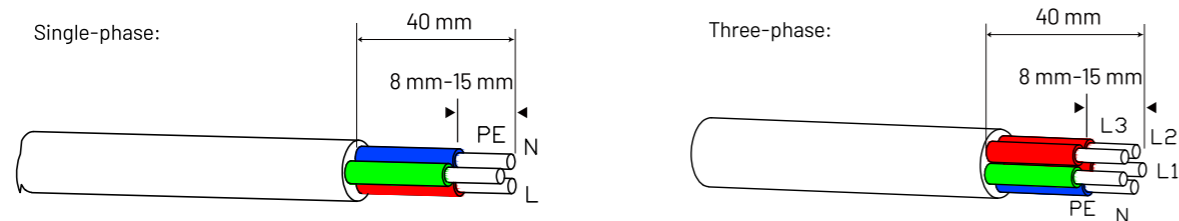


Figure 3-11

4. Fully insert the conductors to the corresponding terminal and tighten the screws with the torque 0.8 Nm. Pull cables outward to check whether they are firmly installed.

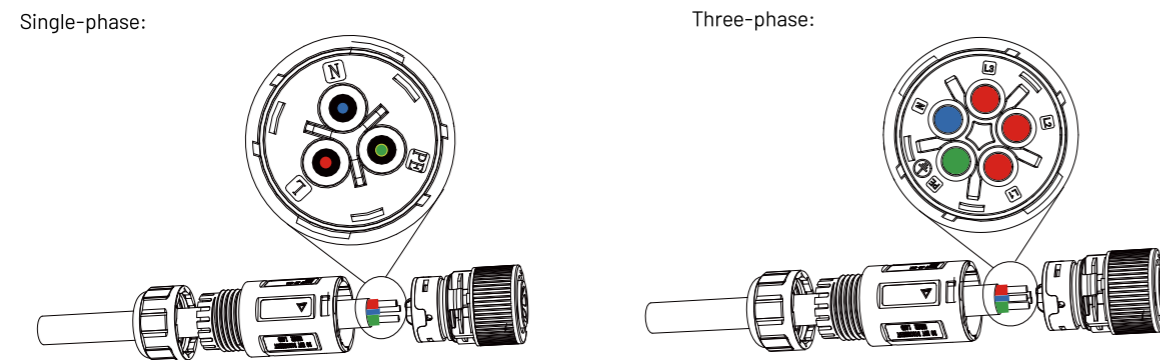


Figure 3-12

5. Assemble the housing, the terminal block, and the cable gland (torque 4 Nm-5 Nm). Ensure that the rib of the terminal block and the groove on the housing engages perfectly until a "Click" is heard or felt.

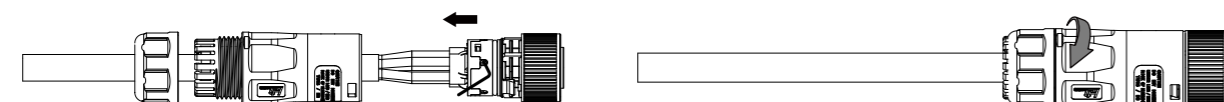


Figure 3-13



NOTE!

Choose one of the three AC terminals and one of the individual AC terminals according to the ingredient information for operation.

3.5.3 Ethernet Communication Connection

The communication interface between the battery and inverter is CAN with an RJ45 connector. The Pins definition is T568B.

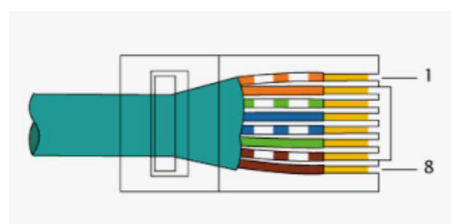


Figure 3-14

3.5.4 CT/Meter Communication Connection

The CT/Meter's communication interface collects electrical energy from the grid. CT refers to sampling through a built-in current transformer. The meter collects power and energy through RS485. The Pins definition refers to below:

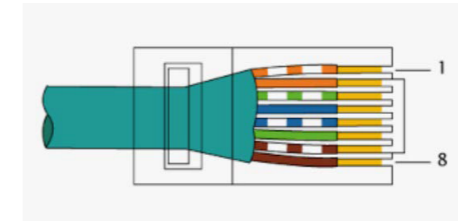


Figure 3-15

Pin	1	2	3	4	5	6	7	8
Function	485A	485B	CT3-2(red)	CT3-1(black)	CT2-2(red)	CT2-1(black)	CT1-2(red)	CT1-1(black)

Table 3-2 Line order

4. Steps to use

- a. Users power up the wallbox;
- b. Users distribute the network;
- c. The wallbox enters the standby state after the self-test;
- d. Users configure the function of the wallbox;
- e. The EV is charging;
- f. After the charging is completed, the wallbox enters the standby state, or the users power it up.

5. Registration and adding device

5.1 Download mobile APP

There are two ways to download Renac SEC:

- a. Download and install <Renac SEC> mobile app by scanning the QR code below.
- b. Download <Renac SEC> from Apple Store / Google Play.



Figure 5-1

5.2 Device registration

1. Open the APP, fill out the required information to create a new account, then click "Submit".

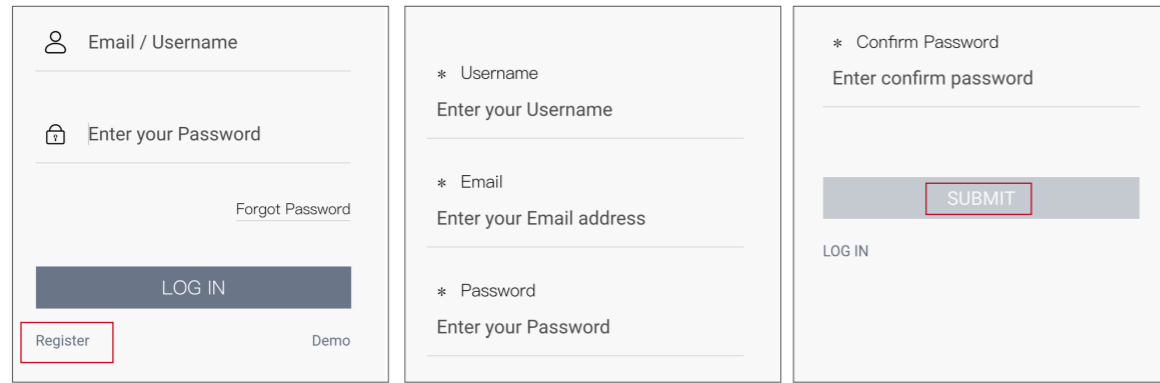


Figure 5-2

2. Add the power station page, fill in the corresponding information, and click [Add station] at the bottom to add a new power station (if you do not need to associate the installer account, you can ignore the "installer" item. Items marked with * are required.)

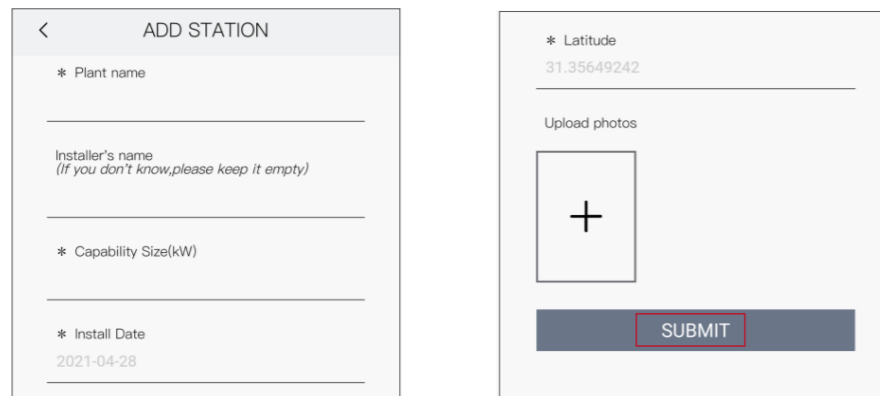


Figure 5-3

3. Click "+" and scan the QR code (charger serial number) on the device label to add a device.



Figure 5-4

4. After adding the power station, back to the home page, and the newly added power station will be shown in the station list.
5. On the home page, click "Statistics" to enter the equipment list.

5.3 Wifi setting

1. Press button five times on the right side of the wallbox to enter the distribution network.
1. Open the Renac SEC, on the home page, click "More".
2. Click "Wifi setting".

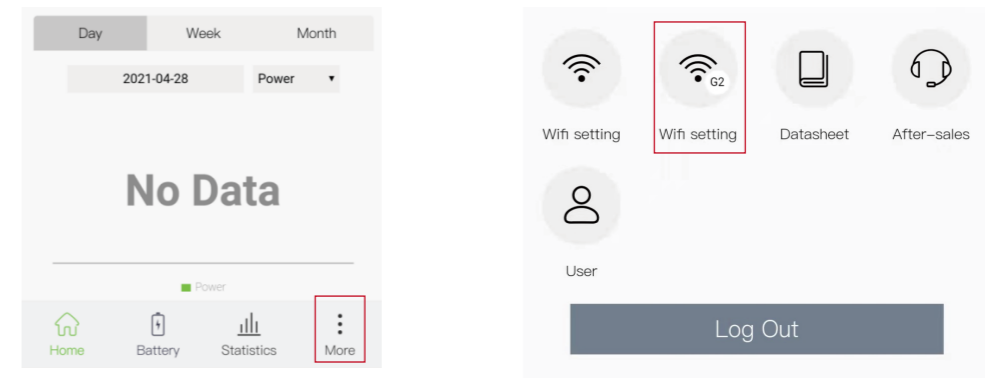


Figure 5-5

3. The router's SSID will be automatically displayed on the "Wifi Setting" interface (if not, please manually type in the router's SSID). Enter the router's password and click "START". Remember that the BLE Name is Renac Sec as default and can't be changed.

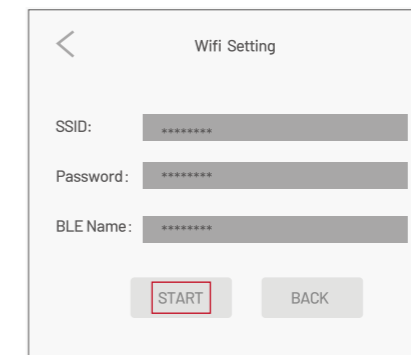


Figure 5-6

4. If the pop up a message says as below figure shown, please turn on your phone's Bluetooth and click "OK".
5. Remark:
 - a. The mobile phone must be with Bluetooth function;
 - b. The Bluetooth must be version 4.0 or higher;
 - c. Wifi setting through Bluetooth it only supports 2.4GHz wireless signal, but doesn't support 5.0GHz.

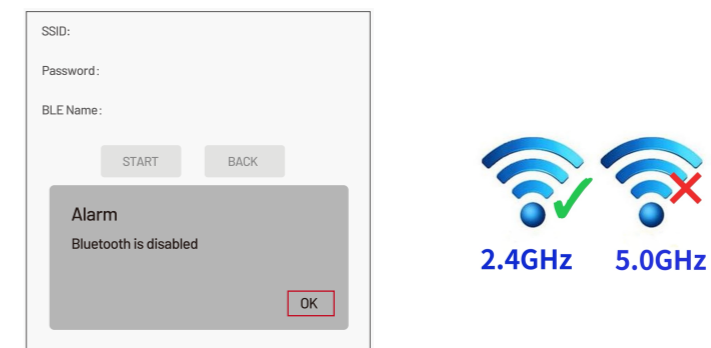


Figure 5-7

6. Indication function

Indicator light state	Description
Blue, green, and red lights flicker alternately	Self-test
Long blue light on	Standby
Blue light flashing	Not charge(the gun is inserted)
Long green light on	Charging
Long red light on	Fault

Table 6-1 Indication function

7. Charging setting

1. Click on "Config" and then click on "Basic" to see the settings interface.

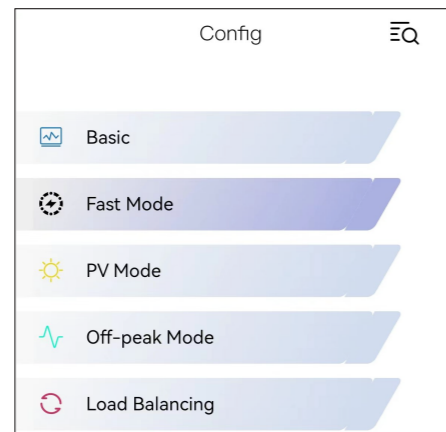


Figure 7-1 Config

2. There are three charging authorization methods: APP, RFID Card, Plug, and Play. "Max output current" refers to the maximum current that the wallbox can supply to the load. "Protect temperature" refers to the maximum temperature the wallbox cannot exceed. "Max input power" refers to the full electrical power the input current consumes. The figure below displays the maximum values for these parameters. Users can set the charging time. In addition to the fast mode, other modes require CTs or meters to participate in the work. So users can choose the wiring method of external current sampling, default CT. Click "+" to add a setting for the start and end time of charging and the price of electricity in the Charging station Off-peak mode. Set these parameters and click "Save" to start charging.

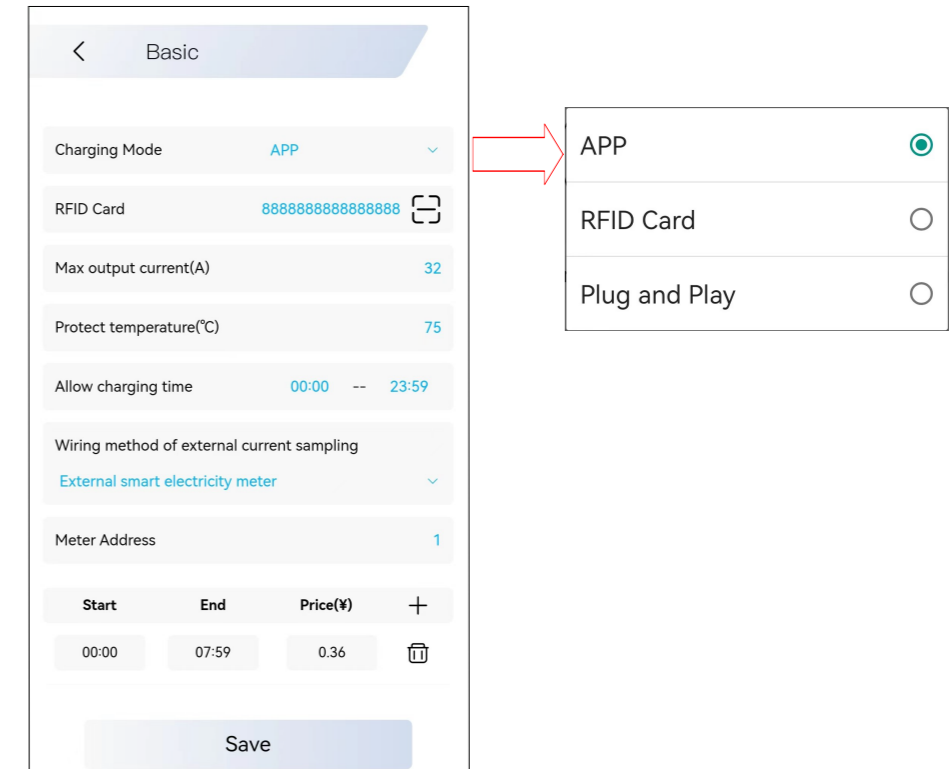


Figure 7-2 Basic

8. Charging mode

8.1 Fast mode

Appointment settings can be based on time, energy, and cost.

Time mode: users can set the target charging time and the start time by clicking "Time".

Energy mode: users can set the target charging capacity(kWh) and the start time by clicking "Energy".

Cost mode: users can set the target budget and the start time by clicking "Cost".

Remark: if users turn on "Plug and Play", users will not be able to set the start time.

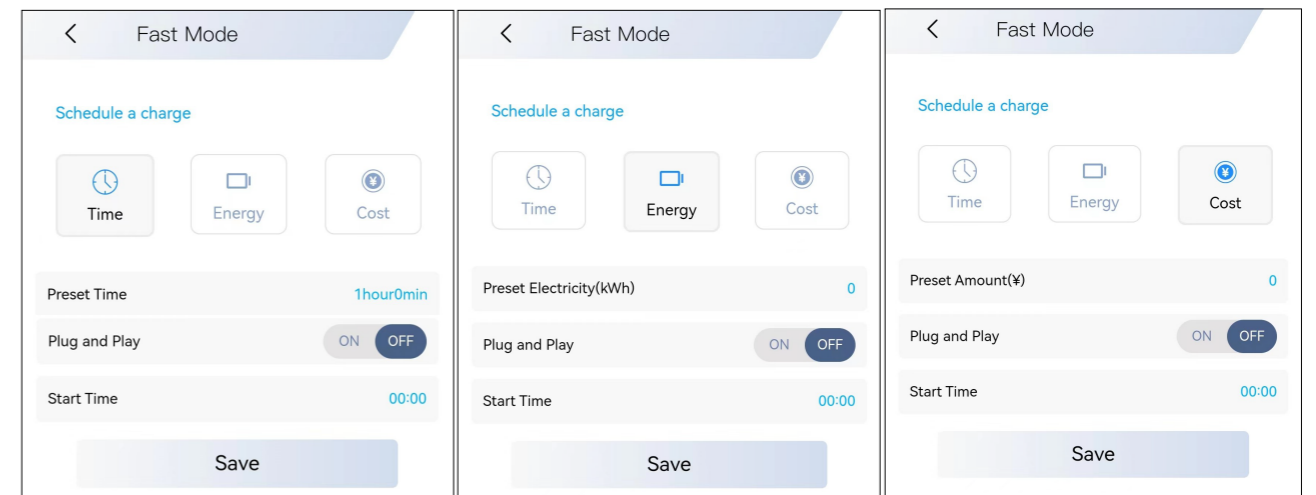


Figure 8-1 Fast mode

8.2 PV mode

In PV mode, users can choose whether to obtain power from the grid.

Turn off the function of importing power from the grid. The EV will be charged dynamically only by surplus solar power when the surplus solar power is more significant than Min. operation power. When surplus solar power is lower than Min. operation power, the wallbox will stop charging.

Turn on the function of importing power from the grid. Users can set the power and charging time before the wallbox works. When the surplus solar power is less than Min. operation power of the wallbox, the EV will use the electricity of the grid to charge. Note: the power setting should be at least Min. operation power of the wallbox.

Manual Boost mode: users can set the start and end times. In this mode, the wallbox uses photovoltaic and grid electricity to charge at the maximum current within the specified period. Even if power is extracted from the grid, it will return to the normal PV linkage mode later. It is useful if users arrive home with an almost empty battery and users want to charge the EV quickly.

Intelligent Boost mode: set a preset deadline and the required amount of charging. When there is photovoltaic power, use photovoltaic charging. When there is no photovoltaic power, and the deadline is not yet reached, start charging from the power grid, allowing users to obtain the required electricity before the deadline. It's useful to guarantees EV's battery capacity before a set time when the solar energy is insufficient.

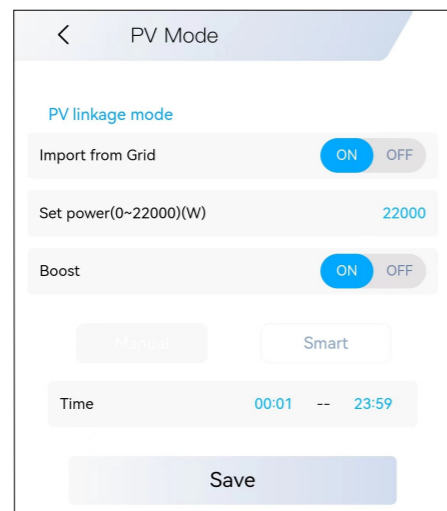


Figure 8-2 PV mode

NOTE!

Calculation method of minimum running power of the wallbox:

- 1) Single-phase wallbox: $P=I \times U \times 1$
- 2) Three-phase wallbox: $P=I \times U \times 3$

The minimum current is 6A. Voltage refers to the phase voltage in use.

To accurately monitor real-time power import and export from the grid, the use of CTs or meters is necessary.

CTs are standard, and the wiring will be as below.

NOTE!

The CT 1 / 2 / 3 must be in phase with the L1 / L2 / L3 of the charging pile. Otherwise, the power sampling will be inconsistent with the actual.

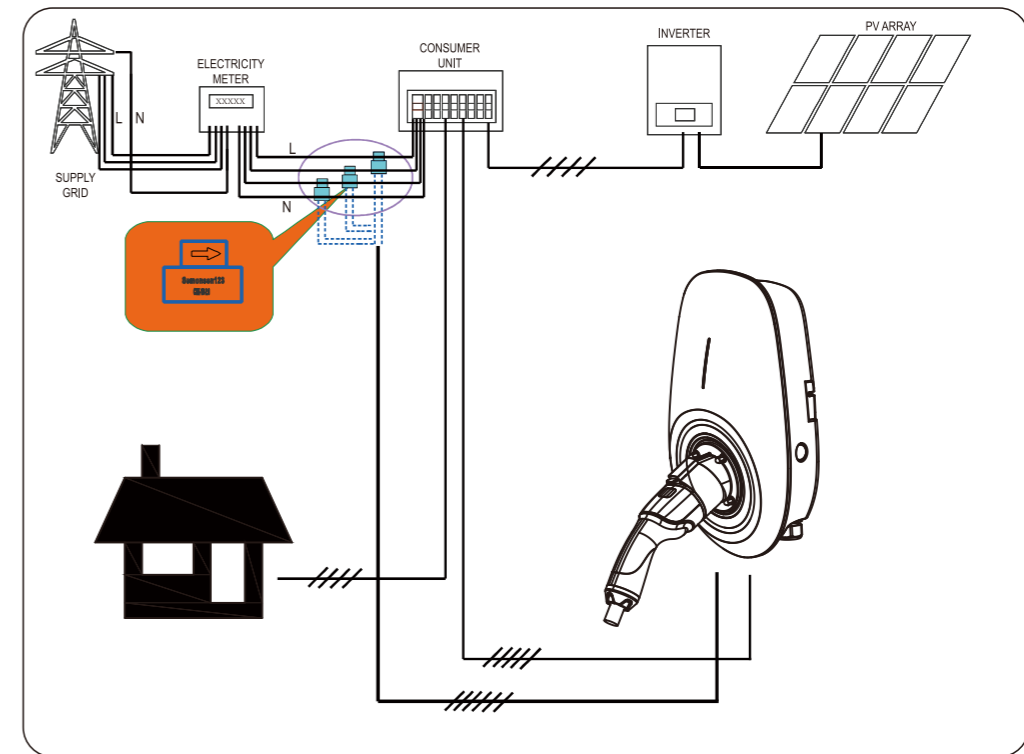


Figure 8-3 CT wiring diagram

Meters are optional, and the wiring will be as below.

For single-phase grid Eastron SDM230 is feasible. For three-phase grid Eastron SDM630 is feasible.

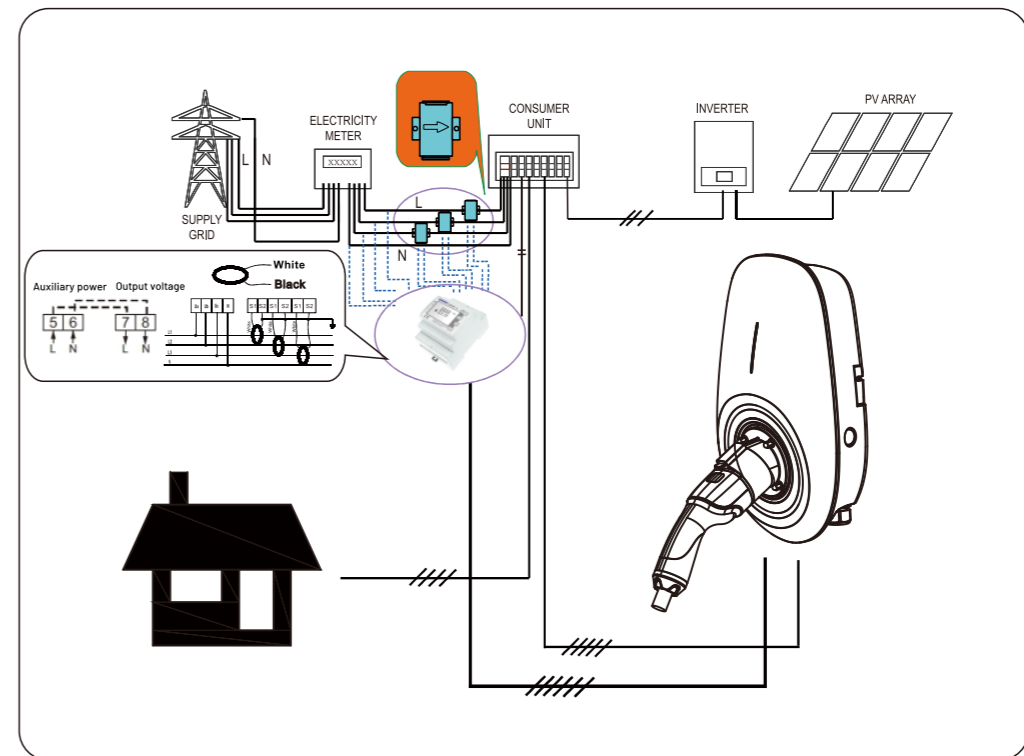


Figure 8-4 Meter wiring diagram

8.3 Off-peak mode

Once the Off-Peak mode is enabled, the wallbox will automatically charge the EV when it's off-peak time to reduce the electricity bill. Users also can customize their low-rate charging time on the off-peak mode page. Users need to input the charging rates in the setting page manually. Choose the off-peak electricity price, and the system will charge maximum power during this period; otherwise, charge at minimum.

Smart Boost mode: it's useful to guarantee EV's battery capacity before a set time when the off-peak time is not long enough. While users enable the smart boost mode and set "pick-up time" and "preset electricity," the EV charger will charge the EV with a target kWh figured by a setting time; it may draw the power from the grid to guarantee the EV's battery capacity when the off-peak time is not long enough.

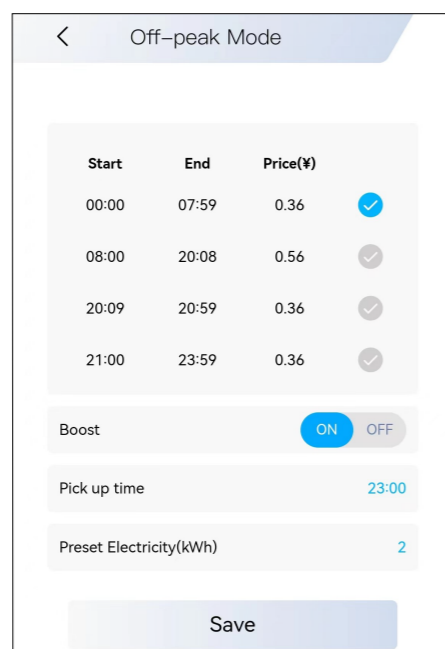


Figure 8-5 Off-peak mode

9. Function description

9.1 Self-test

When the wallbox is powered on, it automatically enters the self-test.

The self-test process indicator light flashes in a three-color cycle and lights up according to the status after completing the self-test as Table 6-1.

9.2 Electronic lock function protection (optional)

The electronic lock is a mechanical type, and when the gun head is inserted into the socket, it can be locked out by the mechanical latch. After the gun head is inserted into the socket, the electronic lock function is activated when the car end is connected. After the charging is disconnected, the electronic lock function stops. First, pull out the car end connector, and then pull out the pile end gun head.

Only when the gun head is detached from the vehicle end can the electronic lock at the pile end be opened. After the power on self-inspection of the EV charger, the electronic lock is detected, and the electronic lock is opened and closed three times (adjusted according to the actual situation). After the detection is normal, the electronic lock will enter the normal working state. If the electronic lock cannot be locked normally, it also can work normally. Still, the current needs to control the current maximum current for charging, and a reminder (indicator light) will be given at the same time.

9.3 Metering function (optional)

The electricity consumption measurement can be achieved by displaying the cumulative and individual electricity consumption through the APP interface.

9.4 Load balancing function(optional)

The optional power management function can self-adjust the output current to ensure that the total household electricity load does not exceed the current value of the total household incoming line. In cooperation with CT, the CT is sheathed on the live wire of the main incoming line (or Three-phase electric power; each live wire needs to be sheathed with a CT), and the current output is detected in real-time to adjust the output current of the wallbox in real-time.

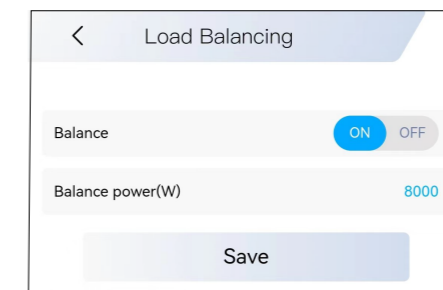


Figure 9-1 Load balancing function



NOTE!

- 1) Suppose the current values of the three live wires monitored by Three-phase electric power are unequal. In that case, the product will self-calculate the minimum output current, and the three output lines will follow this minimum output current.
- 2) When an unbalanced load is connected, the duty cycle output remains fixed at the maximum allowable current and requires external adjustment.

10. Decommissioning

10.1 Packaging

If possible, please pack the wallbox in the original packaging.

If it is no longer available, you can also use an equivalent carton that meets the following requirements.

- Suitable for loads more than 5kg.
- With handle.
- Can be fully closed.

10.2 Storage

- 1) Please keep the wallbox in a dry place (5%-95%RH) where ambient temperatures are always between -20 °C - +60 °C.

10.3 Maintenance

Check the electrical connection and sealing every 6-12 months:

- 1) Check whether the cables are securely connected. Check whether the wires are broken or whether there is any exposed copper core;
- 2) Check whether all the terminals and ports are properly sealed. Reseal the cable hole if it is not plugged or is too big.

10.4 Disposal

When the wallbox or other related components need to be disposed, have it carried out according to local waste handling regulations.

For safe disposal, take inverter to appropriate waste recycling centre in your local area.



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