

Dynamic load balancing

MANUAL

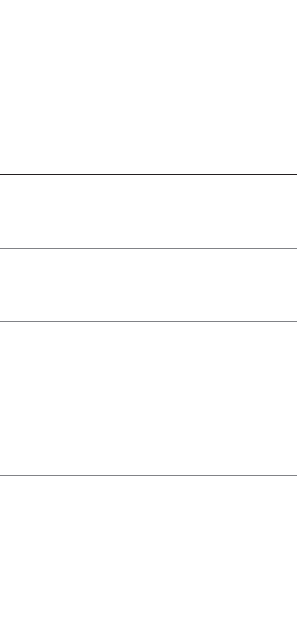
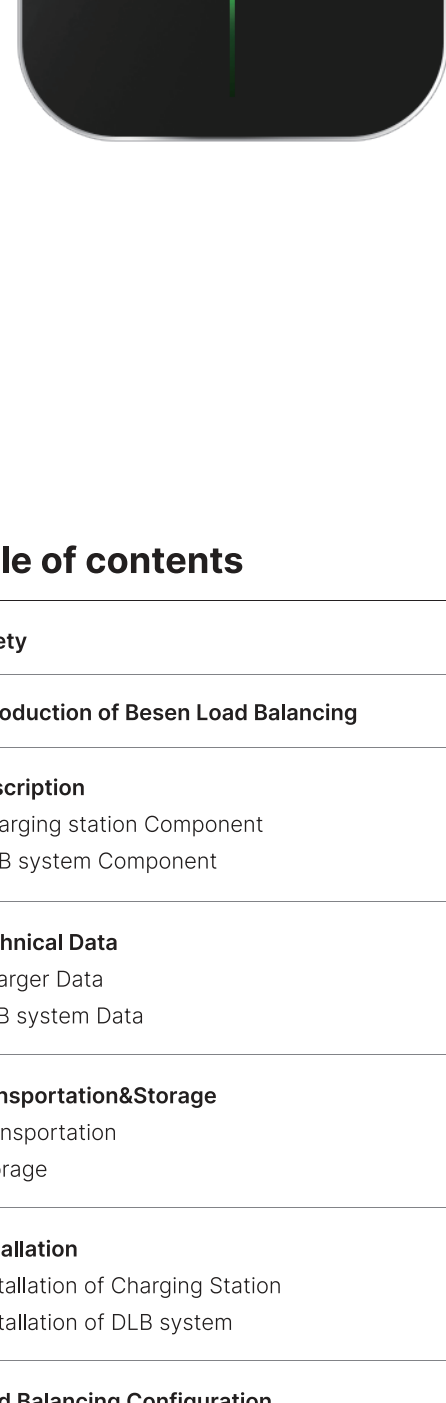


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1. Safety

Please make sure you have fully read and understood the instructions in this manual before you start installing or using the product. If you fail to follow the instructions from this manual you can put persons, surroundings, the environment and the product at risk. Store this manual in an accessible place for future reference.

Always comply with the information, such as labels and the nameplate attached directly to the product and keep the information in a legible condition. Always comply with any applicable laws and regulations that have not been accounted for in this manual.

Security Warning

ATTENTION

Non-compliance with the operating instructions can cause serious consequences.

Manufacturer does not assume any liability for damage caused by disregarding operating instructions or other warnings marked on the device.

High voltage can cause fire hazards! Never use the device if the housing is damaged or opened! This product is not suitable for people with limited mobility, sensory or psychological disabilities, and those who lack use experience or a certain degree of knowledge.

IMPORTANT SAFETY INSTRUCTIONS WARNING!

▲ This product should only be installed, repaired or maintained by authorized electricians and in accordance with national guidelines for electrical installations. All applicable local, regional and national regulations for electrical installations must be respected.

▲ Regularly check if the charger has visible damage. Do not use a damaged product.

▲ Make sure that all safety facilities and connections are available, properly installed and undamaged at all times and are tested regularly to ensure they can operate normally.

▲ Make sure that the input voltage, frequency, circuit breakers and other conditions of the device meet the specifications before the device is powered on. It's important to observe the maximum permissible charging current of the connection.

▲ Before powering on the device, please confirm that the device is properly grounded to avoid unnecessary accidents. If a grounded fault occurs, it is assumed that the cable carries voltage. Please make sure there is no high-voltage power in the system before inspecting the device.

▲ Please insulate the unnecessarily exposed metal parts of all tools to prevent them from touching the metal frame, which may cause short circuit.

▲ To ensure the service life and stable operation of the charging station, the operating environment should be kept as clean as possible with a relatively stable temperature and humidity. The charging station must not be used in flammable environment or environments with volatile gas.

▲ Do not use the charger when the inside of the charging plug is wet.

▲ Do not modify, retrofit, or change any part by yourself under any circumstances.

▲ Please do not use this product as a toy. Please take good care of children to ensure that they will not play with this device as a toy nor put fingers into the charging connector when the power plug is still connected.

▲ The circuit to which the charger is to be connected must be equipped with a residual current circuit breaker.

NOTE

Please do not use it for other purposes except electric car charging. Do not try to disassemble the device by yourself under any circumstances. Otherwise, the internal precision parts may be damaged, and you will not be able to apply for after-sales service.

2. Introduction of Besen Load Balancing

- Household load balancing adopts the one-to-one wireless communication connection between DLB System and charging stations with real-time data;

- The DLB System defaults as the master device, and the charging station defaults as the slave device;

- Users can view the Total Current through the DLB System to know the current consumption of household equipment;

- The user needs to set the current parameter MAINS of the DLB System;

- When the power consumption peaks, the charging station will reduce the charging current, and when the power consumption is low, the charging station will increase the charging current.

3. Description

This Charger is a Mode 3 charger for charging electric vehicles (EV) that complies with the IEC61851 standard.

This Charger is equipped with several features to optimise power consumption and charging performance.

Dynamic Load Balancing

- The load balancing system consists of DLB System and charging stations;

- One-to-one wireless communication between DLB System and charging stations;

- DLB System shell is suitable for standard rail installation;

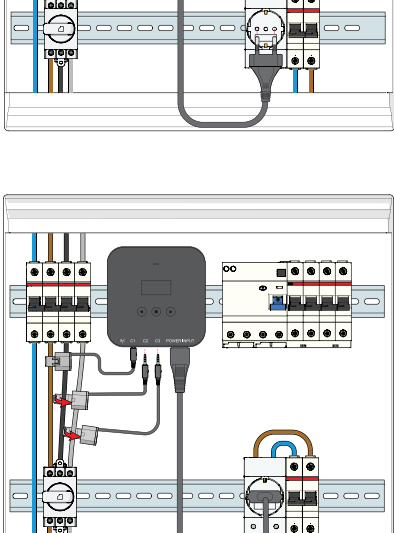
- The load balancing system collects the current consumption of household appliances and adjusts the current of the charging station to rise or fall;

- The DLB System supports current collection from a three -circuit busbar;

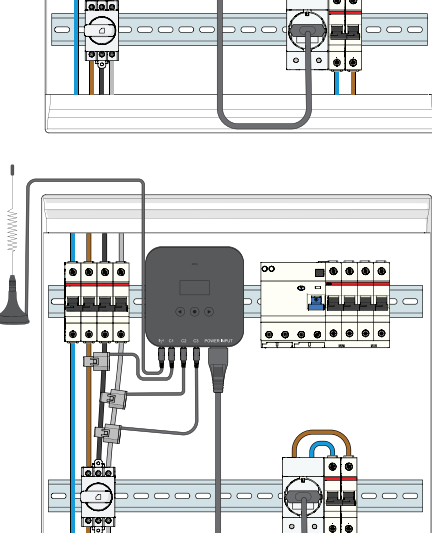
- System parameters and status can be configured through the OLED display and buttons of the DLB System.

3.1 Charging station Component

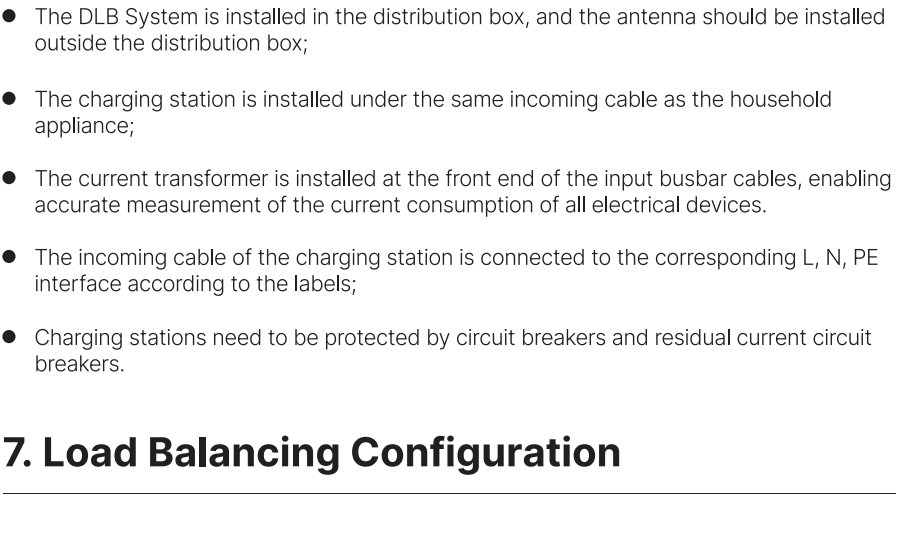
COMPONENTS IN THE BOX (MODE C - With cable)



COMPONENTS IN THE BOX (MODE A - With socket)



3.2 DLB System Component



4. Technical Data

4.1 CHARGING STATION DATA

| Mode C | Mode A |
|---|---|
| Phase Mode: Single / Three Phase | Phase Mode: Single / Three Phase |
| Installation Method: Wall/Stand | Installation Method: Wall/Stand |
| Mode C (with cable) | Mode A (with socket) |
| Certificate: CE | Certificate: CE |
| IP Rating: IP66 | IP Rating: IP66 |
| Rated Voltage: 230V~400VAC+10% 50Hz±10% | Rated Voltage: 230V~400VAC+10% 50Hz±10% |
| Rated Current: 16/32A | Rated Current: 16/32A |
| Maximum Power: 3.84/7.68/11/22kW | Maximum Power: 3.84/7.68/11/22kW |
| Operating Temperature: -25°C~55°C | Operating Temperature: -25°C~55°C |
| Enclosure Material: PC alloy | Enclosure Material: PC alloy |
| Start Mode: Button (default) | Start Mode: Button (default) |

4.2 DLB system Data

| | |
|--------------------------|---|
| DLB System power supply: | input 85~264V AC 50/60Hz; |
| Current transformer: | detection range 0~100A, accuracy 2.0 %; |
| Wireless frequency: | 863MHz/928MHz; |
| Housing dimensions: | 96 * 96 * 39mm |
| Working temperature: | -25°C ~ +50°C . |

5. Transportation&Storage

5.1 Transport

Transport the product in the original packaging, or suitable replacement packaging that provides adequate protection from vibrations, bumps, moisture, dust, and debris.

Be careful not to drop the product and prevent it from moving or bumping into objects while transporting. Excessive vibrations could loosen wire connections and cause the product to malfunction.

5.2 Storage

Always disconnect the product from the power supply when storing the product.

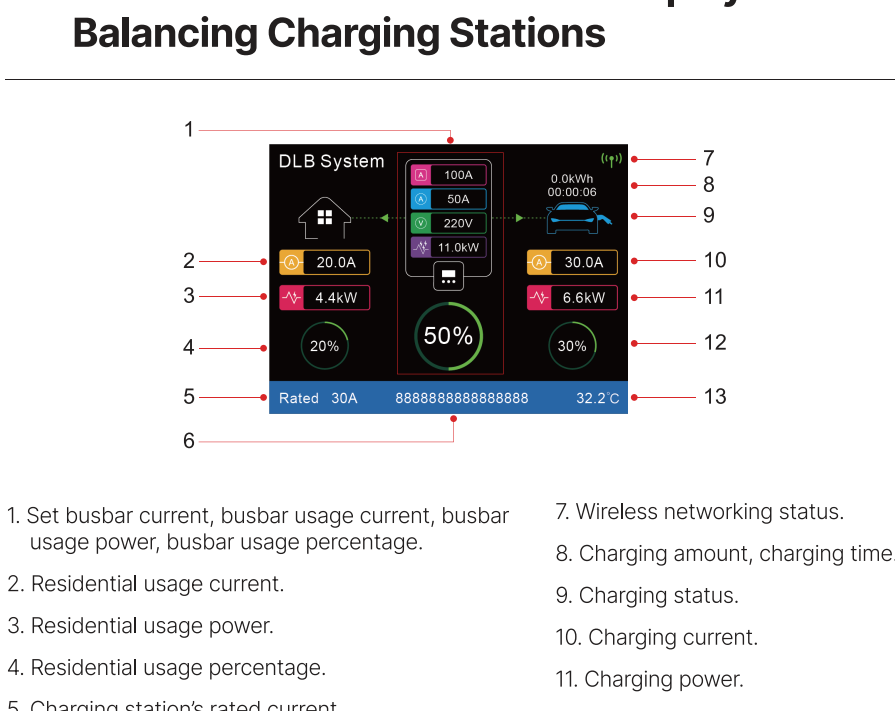
Store the product in environmental conditions within the limits stated in chapter 3 this manual.

Store the product in the original packaging or a suitable replacement packaging to protect the product from moisture, dust, and debris.

Do not store anything on top of the product.

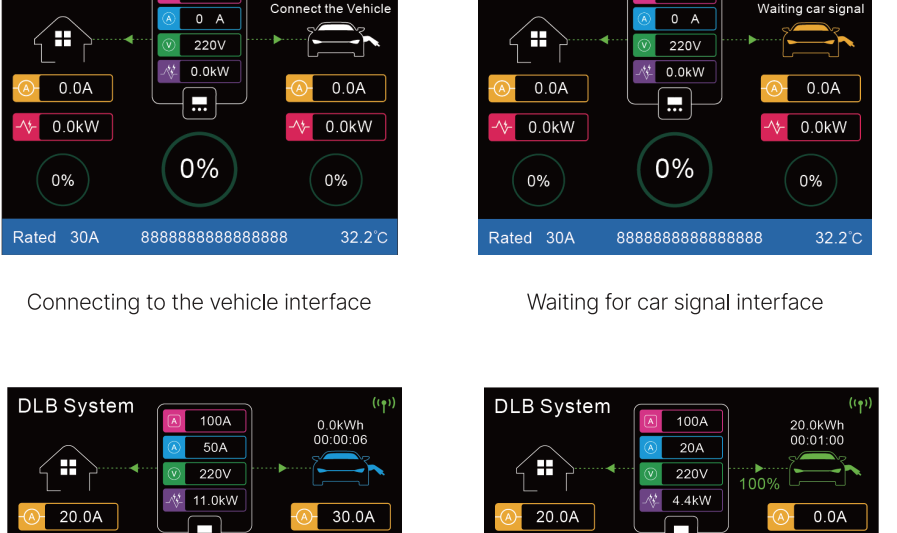
6. Installation

6.1 Charging Station Installation



6.2 Load Balancing System Installation

Wiring Instructions (The diagram below illustrates a three-phase device.)



- The DLB System is installed in the distribution box, and the antenna should be installed outside the distribution box;

- The charging station is installed under the same incoming cable as the household appliance;

- The current transformer is installed at the front end of the input busbar cables, enabling accurate measurement of the current consumption of all electrical devices.

- The incoming cable of the charging station is connected to the corresponding L, N, PE interface according to the labels;

- Charging stations need to be protected by circuit breakers and residual current circuit breakers.

7. Load Balancing Configuration

- The wireless DLB System supports OLED display, and the screen displays current data and balance status;

- There are three setting buttons below the OLED display, which are used for all parameter settings of load balancing and interface navigation;

- Left button: ◀ used to switch interface or busbar current reduction setting;

- Right button: ▶ used to switch interface or busbar current increase setting;

- Middle button: ⏻ used in the setting menu bar to select or confirm the setting.

8. Menu Navigation

- Status displays Total Current: The transformer detects the current and displays the total current consumed by all household appliances in real time;

- Status displays Available Current: According to the MAINS parameter setting, the remaining current that the busbar cable can carry is displayed;

- Status displays (Wi-Fi): Wi-Fi has been connected;

- Status displays (Wi-Fi): Wi-Fi is not connected;

- Parameter setting MAINS: set the maximum carrying current of the mains busbar, the default current is 100A;

- Parameter setting SLAVE: the charging station of the slave machine, scan the device number of the currently connected slave machine, and the default network does not need to be set;

- Parameter setting Bluetooth: DLB System Bluetooth name, APP connection to cancel the network and restore factory settings, no need to set.

9. Introduction to Load Balancing Interface Display

startup screen

total current interface

available current interface

Set Mains Bus Current Interface

Slave Address Interface

Bluetooth Name Interface

10. DLB System Indicator Status

| Status | (blue) | (green) | (red) |
|--------------------------|----------|----------|----------|
| DLB System sends data | Flashing | off | off |
| DLB System receives data | off | Flashing | off |
| Offline | off | off | Flashing |
| Not networked | off | off | Stays on |

11. Introduction to the Interface Display of Load Balancing Charging Stations

- Set busbar power, busbar usage current, busbar usage power, busbar usage percentage.

- Residential usage current.

- Residential usage power.

- Residential usage percentage.

- Charging station's rated current.

- Charger ID.

- Wireless networking status.

- Charging amount, charging time.

- Charging status.

- Charging current.

- Charging power.

- Charging percentage.

- Working temperature.

Connecting to the vehicle interface

Waiting for car signal interface

Charging interface

Charging completed interface

Fault reporting interface

For serious faults, the system cannot recover automatically. In order to remind the user that this fault has occurred, the system will automatically count down for 10 seconds to restart after the user disconnects the charging gun.

Special Scenarios

Uncontrolled vehicles: some vehicles cannot cooperate with charging stations for dynamic balance adjustment. These vehicles typically only have a few gears for current regulation, such as 6A, 8A, 16A, and don't support adjustments for dynamic balance during charging.

Therefore, it's essential to verify whether your vehicle supports linear current regulation when using dynamic balance charging stations.