



## User's Manual



20kW Fast Charging Battery Charger

With CAN/RS485 interface  
IGBT power modules inside



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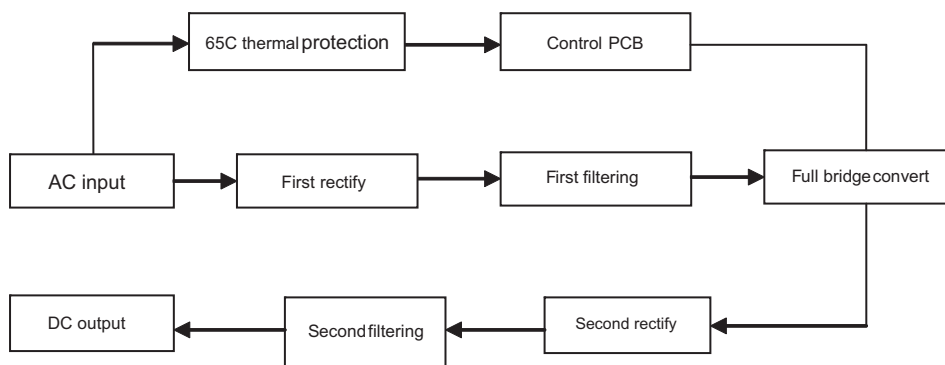
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## Overview

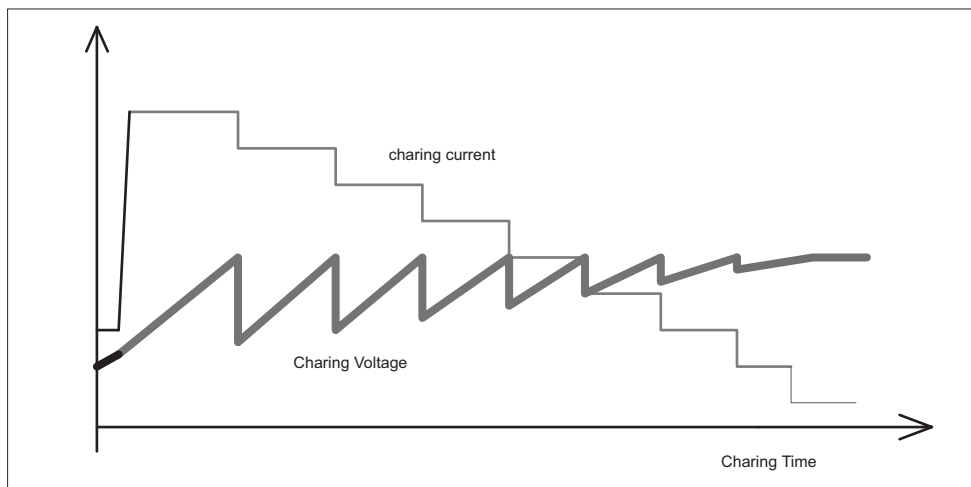
This smart charger for electric vehicle uses high-frequency switching power supply technology, which learn from and absorb the advanced control technology designed. It is a practical, functional and reliable products. This electric vehicle charger is light weight, small size, charge stability, high efficiency, anti-seismic capability, safety and reliability. And it has under voltage, over voltage, reverse polarity, short circuit, overload protection. Curve with a reasonable charge and SCM control the charging process to ensure that the battery is fully charged, and extend the battery life.

### The principle of introduction:

This charger apply full bridge rectification principle. AC input rectifier bridge for the first time into the rectifier filter, resulting in a smooth DC voltage, and the DC voltage through full bridge inverter, generate high frequency AC signal, then the high-frequency alternating current after the second rectifier filter, produces a smooth DC.



## Charging curve



### Charging process description:

1. Preconditioning Charge: when charging machine starts, first 3-5A charging current for four minutes, and then high current charging. Four minutes is a small current to activate the battery charging purposes, the chemical reaction inside the battery fully established, to avoid charging the battery in the cold state;
2. After four minutes the end of a small current, the charging unit into the preset current (eg 20A) constant current charging phase. When the voltage charge to a preset voltage (eg 400V), the charger reduces the charge without entering the voltage constant current value of the stage. Since then continue to detect the charging voltage, when the battery voltage again reaches 400V, the charger reduces the charge current once again (each time decreasing 2A), repeatedly until the charging current over the charging process to 2A, the charger that the battery is fully charged and shut down;
3. Charging authorities in the no-load machine just off the charge rather than the whole state down.



### **Working conditions:**

1. Suitable the battery type: Lead-acid battery, Li-FePO<sub>4</sub> battery, NI-MH battery.
2. Altitude: not exceeding 1,200 m.
3. Ambient temperature: -20 °C ~ +50°C .
4. Relative humidity: 30%~90%.
5. To ensure placement in the No explosive material charge location, there is no corrosion of metal and insulation damage to the gas or steam, dry and ventilated environment.
- 6.No severe vibration and shock, the vertical gradient of not more than 5%.
- 7.the grid voltage fluctuation range of continuing convergence value does not exceed the rated  $\pm 5\%$ , short-term fluctuations (less than 1 second) does not exceed 10% of the fundamental peak instantaneous volatility of not more than 20%.

### **Features:**

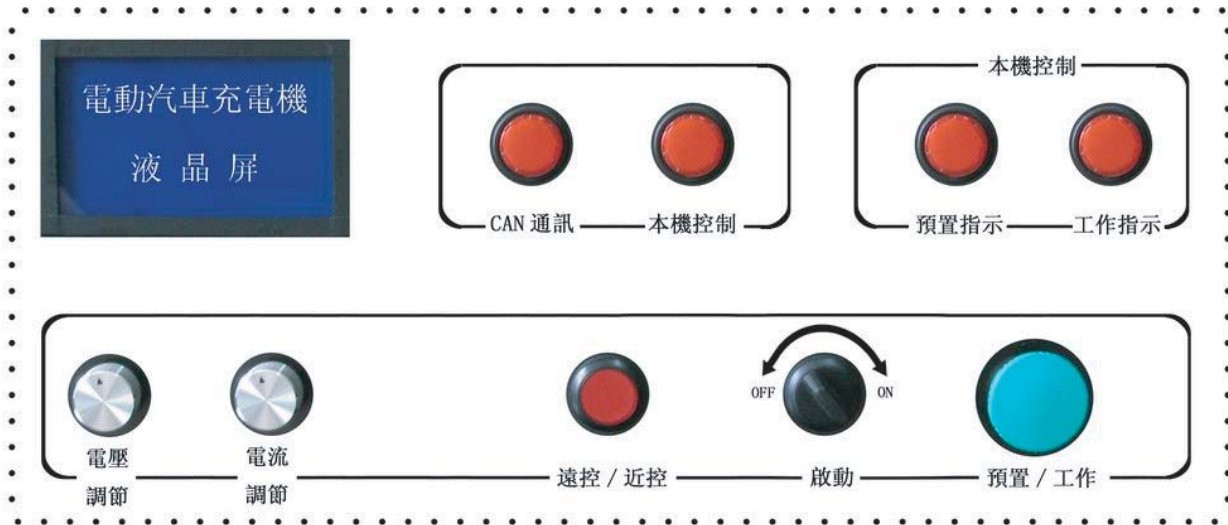
- 1.According to the design characteristics of the battery charge a reasonable curve, both full of batteries and can extend battery life.
- 2.Easy to use, simple maintenance, intelligent charging, without human duty.
- 3.the protection function. Over voltage, under voltage, over current, over heating, short circuit, output reverse polarity protection, etc.
- 4.Intuitive and strong. Charging process and the failure by the LCD screen display, can at a glance.
- 5.Using high-frequency soft switch technology, making the charger and high efficiency, small size, light weight.
- 6.Charger fan switch control by the temperature 45 °C, when the radiator temperature is below 45 °C, the fan does not rotate. When the radiator temperature is higher than 45 °C, the fans began to turn, can reduce noise and extend fan life.

### **The major technical specification:**

- 1) The input is AC380V (three-phase three-wire);
- 2) Input voltage and frequency to adapt to wide range of power in the AC 380V  $\pm 10\%$ , and frequency of 50Hz  $\pm 10\%$  enter the work can be stable and reliable;
- 3) DC output value from 40-400V continuously adjustable.
- 4) Output DC Current value from 5-50A potentiometer continuously adjustable;
- 5) Load regulation:  $\leq 1\%$ ;
- 6) voltage regulation rate:  $\leq 1\%$  load regulation:  $\leq 1\%$ ;
- 7) Ripple Voltage:  $\leq 1\%$ ;
- 8) Leakage current:  $\leq 10\text{mA}$ ;
- 9) Duty cycle: 100%;
- 10) the overall efficiency:  $\geq 92\%$  (full load);
- 11) Power factor:  $\geq 0.85$  (full load);
- 12) Insulation resistance: DC1000V test  $\geq 50\text{M}\Omega$ ;
- 13) Charging Mode: Auto + Manual;
- 14) With charging voltage, current, charge status, display and parameter setting functions;
- 15) With failure alarm and display;
- 16) With pre-constant current charging, constant voltage float late, full auto-stop function;
- 17) Protection class: IP32;
- 18) Cooling: Air Cooled;
- 19) With the protection function of fatal error (such as load reverse polarity, input and output short circuit
- 20) Outline dimension: 900X570X420mm, weight: 100kg.

21) With over voltage, under voltage, over current, over heating, lack phase, corresponding to short-circuit protection;

### Front manual panel



**ON / OFF switch:** When to start charging machine, please switch to the **ON** position, when the charger need to turn off, please the switch to the **OFF** position.

**REMOTE / LOCAL:** When the switch to the **REMOTE** position, the charger from the CAN control, manual operation is not Work; when the switch on the **LOCAL** position: CAN communication cut off, charging into the machine by manual operation way.

**SET / WORK:** When the manual operation, first press the **SET** switch position, the voltage and current values can be set manually. When the voltage and current value finish setting, put the switch to the **WORK** position to start charging machine according to previous setting .

**VOLAGE (V):** Display the actual output of charging voltage value.

**CURRENT (A):** Display the actual output current work.

**VOLTAGE:** Voltage adjustment potentiometer to change the voltage value.

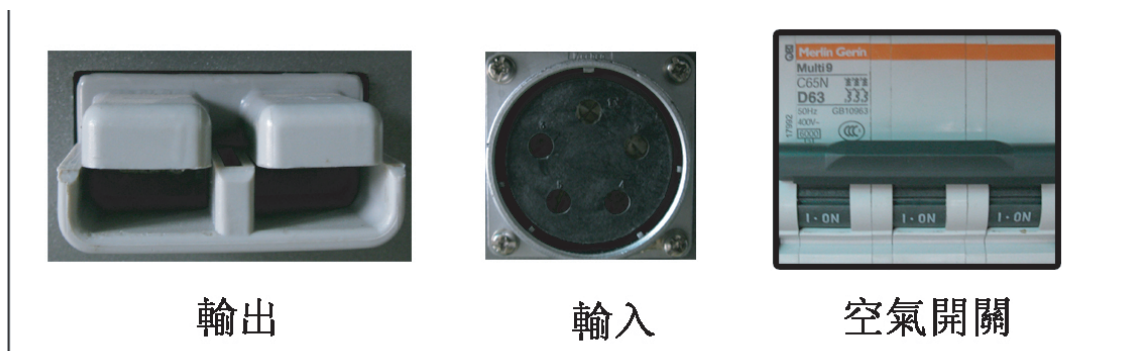
**CURRENT:** Current adjustment potentiometer to change the current value.

**BATTREY:** This LED will be light after the battery connections correctly.

**CHARGE:** When charging is normal this LED will be light.

**ERROR:** When the reverse or short circuit

### Rear manual panel



## Accessories



AC INPUT: AC 3-phase 380V;

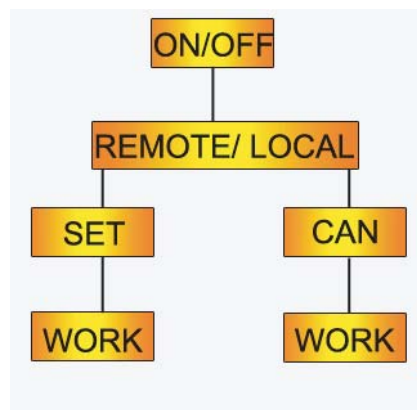
OUTPUT: DC output, the red terminal is positive, the black terminal is negative;

CAN: CAN communication, 1 foot (red line) is high, 2 feet (black line) is low.

### Wiring connection:

1. Firstly, take the charger and the battery connected, the red terminal is positive output, access to battery positive, black-side output is negative, access to the battery negative.
2. the AC input connected, the input for the three-phase 380V, three-phase for the firing line, there is no zero line.
3. Please take a good ground to avoid danger.
4. Turn on the AC switch, charger start.

### Operation option



1. Firstly, open the voltage switch, then select the charging mode.

2. When the manual operation, please select **LOCAL mode**, if controled through the CAN, select **REMOTE mode**;

3. When you select **LOCAL mode**, turn the **SET / WORK** switch to the **SET** position, according to your need to set the voltage, current, and the turn to **WORK** position then the charger start to work.

4. When you select **REMOTE mode**, please connect the CAN communication lines with the BMS or outer company.