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5014000050

IEC Standard

11/22kW 3P Single Gun

AC Main Control Board

V1.0 07/07/2026

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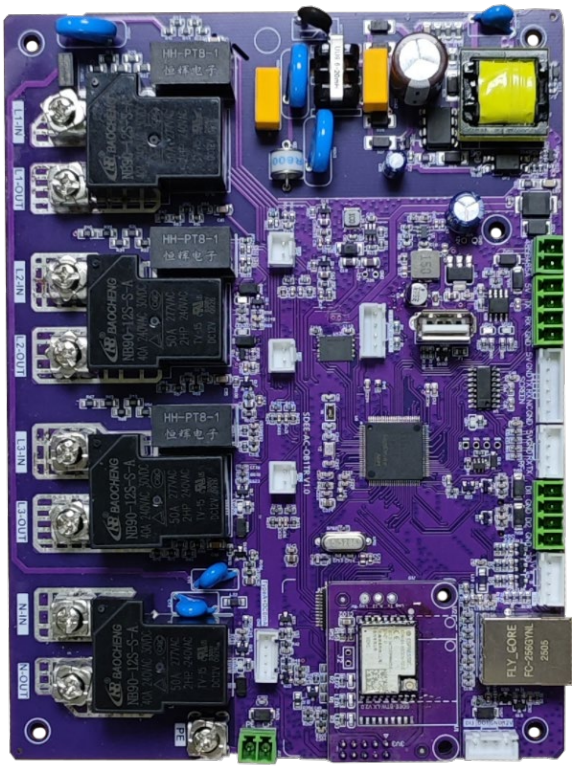
Introduction:

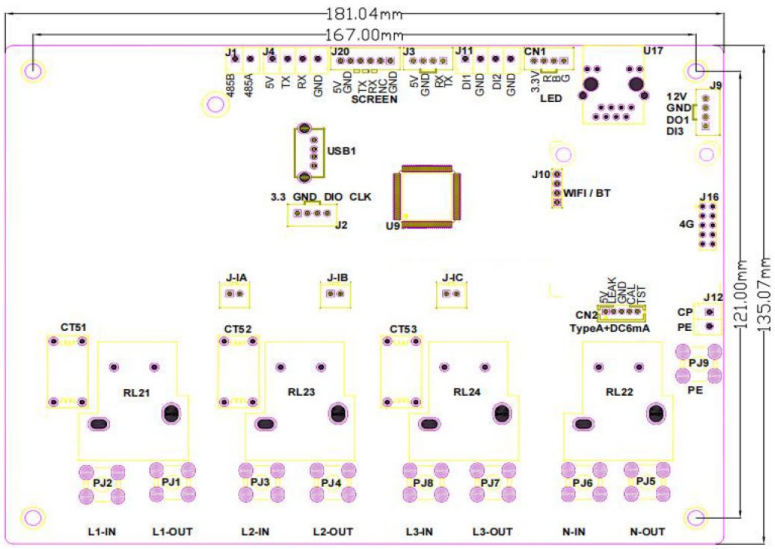
5014000050 is the main control board unit of AC single-gun charging station. The motherboard uses high-reliability integrated modules for power supply, supporting various charging methods such as plug-and-charge, card swiping, and QR code scanning. It includes a three-phase high-precision metering unit that supports multiple time periods and rates for billing. The board integrates various protection functions, including emergency stop detection, door open alarm, overvoltage, undervoltage, overcurrent, undercurrent, CP disconnection, and CP grounding. It also supports the standard TypeA+ DC 6 mA leakage detection function and voice announcement capabilities.

Features:

- Built-in three-phase high-precision metering chip, can be connected with an external electricity meter, and supports the DL/T645-2007 protocol;
- The hardware supports simultaneous integration of four networking modules: Ethernet, 4G, Bluetooth, and WiFi, allowing free switching of connection methods via the on-screen interface;
- Features onboard OCPP1.6J communication protocol, scalable to OCPP2.0; supports splash screens and connects to overseas main control board maintenance platforms;
- Compatible with various displays (typically 4.3/7-inch), supports multi-language display, and allows UI customization;
- Supports multiple charging methods including Plug & Charge, card swiping (POS machine supported), password authentication, and QR code scanning;
- Supports integration with EMS systems, power limiting, remote diagnostic logs, and OTA upgrades (via operation platform, maintenance platform, or device screen update).

Product Appearance & Size:





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Interface Definition Description:

This product has multiple functional interfaces for controlling the operation of each component of the charging pile. All pins are defined as follows:

Port Group Name	Corresponds Ports	Port Definition	Function Description
METER	485A, 485B	External meter interface, 485 level, DL/T645-2007 communication protocol	Reserved external meter
SCREEN	5V, GND, TX, RX, NC, GND	External display interface, TTL electrical level, serial port communication, providing 5V power to the display screen. Mainboard TX is connected to the display RX, mainboard RX is connected to the display TX	Reserve external display screen
RF	5V, GND, NC, NC, RX, TX	External card reader interface, 232 electrical level, serial port communicates with the card reader to provide 5V power. Mainboard TX is connected to the card reader RX, mainboard RX is connected to the card reader TX	Reserve external card swiping board communication
LED	3.3, R, B, G	The external lamp bar interface provides 3.3V to the lamp bar Power supply. R is connected to the alarm light, B is connected to the charging light, G is connected to the standby light	Reserve external indicator bar
DI1	DI1, GND	Digital Input, normally closed	Emergency stop detection, alarm when disconnected, normal when connected
DI2	DI2, GND	Digital Input, Normally Open	Door Open Detection, alarm when connected, normal when disconnected
J9	12V, GND, DO1, DI3	Reserved Interface	Reserved Interface
CP	CP, PE	CP interface, CP line and PE line for charging gun	CP interface
J- IA	J- IA	The external current transformer is connected to the charging gun, and the A phase L line passes through this transformer	A phase current transformer CT interface
J- IB	J- IB	The external current transformer is connected to the charging gun, and the B phase L line passes through this transformer	B phase current transformer CT interface
J- IC	J- IC	The external current transformer is connected to the charging gun, and the C phase L line passes through this transformer	C phase current transformer CT interface
A+6	TypeA+ DC 6 mA	The external TypeA+ DC 6mA is connected to the mainboard, and all L lines and N lines of the input pass through this detection module	TypeA+ DC 6 mA leakage detection module interface
L1- IN	A Line (L) in	Phase A Line (L) in	Three-phase electrical input
L2- IN	B Line (L) in	Phase B Line (L) in	

L3- IN	C Line (L) in	Phase C Line (L) in	
N-IN	Neutral (N) in	Neutral (N) in	
L1- OUT	A Line (L) out	Connect the charging gun to phase A and L line	Three-phase electrical output
L2- OUT	B Line (L) out	Connect the charging gun to phase B and L line	
L3- OUT	C Line (L) out	Connect the charging gun to phase C and L	
N- OUT	Neutral (N) out	The neutral line is connected to the charging gun	
PE	Ground (G)	The power ground wire and the charging gun ground wire are combined	Ground (G)

Technical Parameter:

Model	5014000050
Power	11 kW or 22 kW
Input voltage	380V±10% (3P)
Input currenton	0~16A (11 kW) or 0~32A (22 kW)
Card reader interface	RS 232 Support /customized agreement
Display interface	The TTL supports 5V power supply output
Indicator light interface	1 set of RGB lights, supporting constant lighting and running lights, customizable
Emergency stop DI interface	Normally open
Threshold DI interface	Normally open
Board-mounted metering	Support, accuracy level 2.0
External meter interface	Support, RS 485, DL/T645-2007 communication protocol
New national standard leakage detection	Optional, TypeA+ DC 6 mA
Voice broadcast	Optional, high quality speaker indicates charging status
Network communication interface	Optional Ethernet /4G/ Bluetooth/WiFi
Working temperature	-20°C~ +65°C
Storage temperature	-40°C~ +85°C
Motherboard size	177 mm*131 mm
The compliance of the lead-free requirements	Lead free/conforms to Directive (RoHS 3) on the restriction of hazardous substances

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Parameter Configuration:

- Use USB to 232 serial cable to connect the computer and motherboard, through the configuration tool software " ParamConfigTool. exe" to configure local parameters;
- In the case of networking, remote parameter configuration is carried out through the first power "master control board full life cycle management platform".

Typical Applications:

As the main control board in the automotive AC charging pile, it is widely used in wall-mounted, portable and pillar AC single gun charging piles.

Installation Instructions:

Installed in a waterproof plastic or sheet metal housing.

Disclaimer:

The product will be continuously upgraded and iterated, as well as make technical modifications. Subsequent product assembly and technical parameters will have corresponding changes. This document is an introduction to the main control board; the images, data, and descriptions contained herein are not used as the basis for order acceptance. OSWELL reserves the final right of interpretation for this document.