AC DIDACTIC CHARGING STATION DEMONSTRATOR

DL DM104 AC

INTRODUCTION

Demonstrator developed for the study plug-in electric vehicle charging system structure, charging voltage detection, charging current detection and fault detection analysis. The circuit schematic diagram on the panel show the connection between main components of **AC charging station**.
The bench panel has been developed with integrated design, simple and elegant, durable, safe and reliable. The base of demonstrator is equipped with a 40cm wide shelf. It is convenient for placing materials, light testing instruments, etc. The equipment is equipped with self-locking casters for flexible movement.

MAIN COMPONENTS

- Single-phase circuit breaker (Air switch).
- Surge protector.
- AC contactor.
- Charging load simulator.
- National standard charging load interface.
- Charging gun.
- Charging gun socket.
- Emergency stop switch.
- Card reader.
- 24-inch touch all-in-one computer.

- AC charging main control board.
- Car charger signal board.
- USB cable.
- LED light strip.
- Fault setting main board.
- Tablet.
- Movable bench.

MAIN CHARACTERISTICS

1. This bench is based on the **AC charging system**, and displays the AC slow charging interface, slow charging wiring harness, vehicle charger, power battery and other circuits on the panel. The system permits to measure the key signals and to introduce fault in the main components.
2. The demonstrator includes a schematic panel, and a light-emitting diode light strip arranged in the protective layer of the high-voltage wiring harness. The LED light strip shows the direction of the current.
3. The system is equipped with a Windows system touch all-in-one computer with a size of 24 inches. The built-in charging system human-computer interaction software can display the charging voltage, current, power consumption amount and charging pile fault code in real time.
4. With charging information display function, it can display charging system output status, output current, charging temperature, output voltage, CP (**C**ontrol **P**ilot) frequency, CP duty cycle, CP voltage, charging time, charging power, consumption amount, fault code and other information in detail.
5. The charging interface can choose; automatic charging, charging by power, charging by time, charging by amount. It includes the function of vehicle 3D dynamic rotation.
6. Through green and red status icons is possibly know the status of charging pile.
7. The human-computer interaction interface of the charging system has the functions of fault setting and data query, which can set faults on internal CP circuit, smart meter, working status indicator, card reader, temperature sensor and other circuits of the charging system.
8. The main board of the charging system has CAN bus interface, electric meter communication interface, credit card billing communication interface, PC communication interface, AC voltage fast measurement module, emergency stop detection interface, temperature detection interface, CP signal interface, isolated network interface, 4G module communication circuit interface, Bluetooth interface, Wi-Fi interface, etc.
9. Equipped with an intelligent fault setting and assessment system. Through the tablet wireless fault setting, the teacher sets the fault. 8 faults are available.
10. AC charging is carried out by simulating the whole vehicle load through high-power aluminium resistance and the normal charging process can be realized without connecting the charging pile to the vehicle.
11. The training bench is equipped with a software package. It can be used with the computer using USB disk and dongle.

GENERAL CHARACTERISTICS

- Dimensions (HxLxW): approx. 1760x1600x700 mm.
- Operating voltage: 12Vdc.
- Input power supply: single-phase from the mains, 50/60 Hz.
- Operating functioning temperature: -40°C to +50°C.

AC ELECTRIC VEHICLES CHARGING STANDARDS AND CODE VERSION

- **Type 1 (SAE J1772)***: this one comes from the US and Asia. It's a single-phase standard and it offers up to 7.4 kW of power. However, it's not too common in Europe anymore as car manufacturers are allowed to sell only Type 2.
  Locking Mechanism: Features a physical latch on the top of the connector to secure the plug to the vehicle while charging.
- **Type 2 (Mennekes)***: this is the European favourite. It's versatile and can handle both single-phase and three-phase AC charging. Therefore, it offers up to 43 kW.
  Electronic Lock: There is no manual lock; the car electronically locks the connector for safety while charging.
- **GB/T AC (Guobiao standard)***: this is the Chinese national EV charging standard. It uses a dedicated AC interface that is visually similar to Type 2 but is **not electrically or mechanically interchangeable** with the European Type 2 standard. In AC applications it is commonly used up to 27.7 kW (440 V, 63 A).

: The reference to the electrical power at electric car charging stations is purely real and informative, but it doesn't correspond to that provided by our educational systems; the charging stations handle industrial power, while the teaching panels operate in complete safety for classroom learning.

To meet almost all international standards, the **AC Charging Station "DL DM104 AC"** is available in **three versions** depending on the final customer's standard.

These are:

- **DL DM104US AC** for **Type 1**.
- **DL DM104EU AC** for **Type 2**.
- **DL DM104CN AC** for **GB/T AC**.

Supplied with a detailed practical manual with all the necessary accessories.