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**Energy Industry Standard  
of the People's Republic of China**

**NB/T 33002-2010**

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**Specification for electric vehicle A.C charging point**

电动汽车交流充电桩技术条件

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## Foreword

This Standard was proposed by China Electricity Council.

This Standard shall be under the jurisdiction of the National Technical Committee for Standardization of the Electric Vehicle Charging Facilities in the Energy Industry.

Drafting organizations of this Standard: China Southern Power Grid Co., Ltd, Electric Power Research Institute of Guangdong Power Grid Corporation, China Electric Power Research Institute, Shenzhen Power Supply Administration, State Grid Electric Power Research Institute, Xuji Power Supply Co., Ltd, Zhejiang Electric Power Company, and North China Grid Company Limited.

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The comments or suggestions generated during the execution of this Standard shall be fed back to the Standardization Center of China Electricity Council (No. 1, 2<sup>nd</sup> Lane, Baiguang Road, Beijing, 100761).

# Specification for electric vehicle A.C charging point

## 1 Scope

This Standard specifies the basic constitution, functional requirements, technical requirements, test items, product information, and other aspects of electric vehicle A.C charging points (hereinafter referred to as “charging points”).

This Standard applies to the model selection, configuration and inspection of conductive charging points.

## 2 Normative references

The following documents are essential to the application of this Standard. For dated references, only the versions with the dates indicated are applicable to this Standard. For undated references, only the latest versions (including all the amendments) are applicable to this Standard.

GB/T 18487.1-2001 Electric vehicle conductive charging system – Part 1: General requirements

GB/T 20234 Plugs, socket outlets, vehicle couplers and vehicle inlets for conductive charging of electric vehicles – General requirements

GB 4208-2008 Degrees of protection provided by enclosure (IP code)

GB/T 4797.6-1995 Environmental conditions appearing in nature for electric and electronic products – Dust, sand, salt mist

GB 7251.1-2005 Low-voltage switchgear and controlgear assemblies – Part 1: Type-tested and partially type-tested assemblies

## 3 Terms and definitions

The following terms and definitions are applicable to this Standard.

### 3.1 On-board charger

The on-board chargers refer to the chargers that are fixedly mounted on the electric vehicles for operation.

### 3.2 AC charging spot

The AC charging spots refer to the conductive power supply units that are specially used for providing AC power supply for the electric vehicles with on-board chargers.

## **4 General principles**

**4.1** The charging spots shall provide safe and reliable AC power supply for the on-board chargers.

**4.2** The charging spots shall be operated in a safe, simple and reliable way.

## **5 Basic constitution**

The charging spots are composed of piles, electrical modules, metering modules, etc. The electrical modules and metering modules shall be installed inside the piles. The piles include shells and man-machine interactive interfaces. The electrical modules include charging sockets, cable terminal blocks, safety protection devices, etc.

## **6 Functional requirements**

### **6.1 Man-machine interactive function**

#### **6.1.1 Display function**

The charging spots shall display the relevant information in each state. The display characters shall be clear and integrated without any defects. Furthermore, the display characters shall be possessed of high contrast, and shall not be identified by means of the ambient light.

#### **6.1.2 Input function**

The charging parameters of the charging spots shall be manually set.

### **6.2 Metering function**

The charging spots shall be capable of metering the electric energy output.

### **6.3 External communication**

The charging spots shall be possessed of relevant interfaces for external communication.

### **6.4 Software upgrading**

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### 7.4.3 Electromagnetic compatibility

The electromagnetic compatibility of charging spots shall meet the requirements specified in the Article 7.10 of the GB 7251.1-2005.

### 7.5 Safety requirements

The safety requirements of charging spots include the following contents:

- a) The shells made of non-insulating materials shall be grounded in a reliable way;
- b) The charging spots shall be equipped with load-carrying separable circuits;
- c) The charging spots shall be equipped with power leakage protectors;
- d) The charging spots shall be equipped with overcurrent protectors;
- e) The charging spots shall have the function of lightning protection;
- f) The charging spots shall be equipped with emergency stop switches.

## 8 Inspection and test items

SEE Table 2 for the exit-factory test and the type test. As shown in the table, the items with “√” shall be considered as test items, while the items with “-” shall be considered as conditional test items.

**Table 2 Inspection and Test Items**

Serial No.	Test Items	Type Test	Exit-factory Test
1	General Inspection	√	√
2	Insulation Resistance	√	√
3	Power-frequency Voltage-withstand Test	√	√
4	Impulse Voltage Withstand Test	√	-
5	Protection Level Test	√	-
6	Electromagnetic Compatibility Test	√	-

### 8.1 General inspection

The general inspection includes the following contents:

- a) The structure of charging spots shall meet the requirements specified in the Articles 7.3 and 7.5 of this Standard;

- b) The functions of charging spots shall meet the requirements specified in the Article 6 of this Standard.

## **8.2 Insulation resistance**

The insulation resistance test shall be conducted according to the requirements specified in the Article 8.3.4 of the GB 7251.1-2005. The results shall comply with the requirements specified in the Article 7.4.2.1 of this Standard.

## **8.3 Power-frequency voltage-withstand test**

The energized circuits in the charging spots shall be able to be conducted with the power-frequency voltage-withstand test for 1min specified in Table 1. There shall be no insulation breakdown or flashover during the test.

The test sites are as follows:

- a) Between the energized circuits without electrical connection;
- b) Between the independent energized circuits and the ground (metal frames);
- c) Between the DC bus bar and the small voltage bus bar in the cabinet, grounded at the time of disconnecting all other connecting sub-circuits.

## **8.4 Impulse voltage withstand test**

According to the provisions specified in Table 1, respectively APPLY the short-time impulse voltage with positive polarity and negative polarity lightning waves between the energized circuits in the charging spots and the ground (metal frames) for 3 times. The interval time for each time shall not be less than 5s. There shall be no disruptive discharge during the test.

## **8.5 Protection test**

The protection test includes the following contents:

- a) Dustproof test: The dustproof test shall be conducted according to the requirements specified in the Article 13 of the GB 4208-2008. The test results shall comply with the provisions specified in the Article 7.4.1.1 of this Standard.
- b) Waterproof test: The waterproof test shall be conducted according to the requirements specified in the Article 14 of the GB 4208-2008. The test results shall comply with the provisions specified in the Article 7.4.1.1 of this Standard.

### **8.6 Electromagnetic compatibility test**

The electromagnetic compatibility test shall be conducted according to the requirements specified in the Article 8.2.8 of the GB 7251.1-2005. The test results shall comply with the provisions specified in the Article 7.4.3 of this Standard.

## **9 Marks**

The marks of charging spots shall meet the relevant requirements specified in the Article 5 of the GB 7251.1-2005.

\_\_\_\_\_ **END** \_\_\_\_\_