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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 39752-2024

Replacing GB/T 39752-2021

**Safety requirements of electric vehicle conductive supply
equipment**

电动汽车供电设备安全要求

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1 Scope

GB 39752-2024 is the Chinese national standard on safety requirements of electric vehicle conductive supply equipment, in the field of road vehicles engineering. It carries no /T suffix, which in the Chinese system means compliance is mandatory: a product or a practice within its scope has to meet it to be lawfully made, sold or carried out in China. It was issued on 24 July 2024 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 August 2025. Classification: ICS 43.040.99, CCS T 35. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document specifies the safety element requirements of EV energy transfer equipment (hereinafter referred to as "power supply equipment"), establishes test general rules,

describes the corresponding test methods.

Note. For independent electrical accessories and auxiliary materials (such as connecting devices, cables, insulating materials, etc.) of power supply equipment, they must be used in combination with this document according to specific product standards. This document is applicable to various types of power supply equipment, which has a rated output voltage of 1000 V AC or 1500 V DC and below, including power supply equipment in mode 2, mode 3, mode 4. This document does not cover the following. - Functional and performance requirements of power supply equipment not related to safety; - Information security requirements; - Safety requirements related to transport packaging and improper use; - Safety requirements caused by deliberate destruction and other purposeful behaviors; - Safety requirements for power supply equipment with discharge function; - Safety requirements for power supply equipment with automatic charging and top contact charging.

2 Normative references

The contents of the following documents constitute essential clauses of this document through normative references in the text. Among them, for dated references, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies to this document.

GB/T 2423.1 Environmental testing for electric and electronic and electronic products - Part

3 Terms and definitions

The terms and definitions as defined in GB/T 18487.1-2023 and GB/T 29317-2021, as well as the following terms and definitions, apply to this document.

3.1 EV energy transfer equipment Equipment that connects the electric vehicle to the power grid (power source) and enables energy flow.

3.2 Enclosure An enclosure that provides the appropriate type and degree of protection for its intended use.

3.3 Tool An appliance that can be used to turn screws, latches or similar fixings.

4 Symbols and abbreviations

4.1 Symbols The following symbols apply to this document. IDeltan. Rated residual operating current IK. Protection level code of the enclosure against harmful mechanical collisions from the outside world IPXX. Enclosure protection level code

4.2 Abbreviations The following abbreviations apply to this document. AC. Alternating Current CPT port. Conductive Power Transfer port

5.1 Conditions of use

5.1.1 Environmental classification The classification of the use environment of power supply equipment is shown in Table 1.

5.1.2 Pollution degree The pollution degree of the power supply equipment is the pollution degree of the external environment. The minimum pollution degree of the power supply equipment used indoors is PD

2. When the indoor environment is exposed to a polluted industrial environment, the minimum pollution degree is PD

3. The minimum pollution degree of the power supply equipment used outdoors is PD3.

5.2 Structure

5.2.1 General requirements The structure of the power supply equipment, including the enclosure, partitions, door locking devices and hinges, connections and splicing, shall have sufficient mechanical strength, to withstand the stress encountered during use under normal conditions and fault conditions.

5.2.2 Handles and manual control devices Handles, knobs, clamps, joysticks and other similar moving parts shall be firmly installed and shall not be loose under normal use.

5.2.5 Enclosure openings The configuration and construction of the openings shall ensure that foreign objects entering the openings will not contact the exposed live parts and cause danger. Openings in door panels, panels, covers, etc. shall meet the protection requirements of IPXXC when closed or in place. Power supply equipment intended for use in more than one direction is applicable to each direction.

5.2.6 Protection level The protection level of the power supply equipment's enclosure for outdoor use shall not be less than IP54; the protection level of the power supply equipment's enclosure for indoor use shall not be less than IP32.

5.3.1 Decisive voltage level limit (DVC) The electric shock protection measures depend on the decisive voltage level of the circuit. The decisive voltage level of the circuit depends on the operating voltage limit of the circuit and the insulation measures adopted. Circuits that meet DVC level A are touchable.

5.3.2 Insulation measures

5.3.2.1 Basic protection Under single fault conditions, including failure of functional insulation, basic insulation or supplementary insulation, the electric shock protection provided by the power supply equipment shall not cause a voltage higher than DVC level A on the accessible circuit or accessible conductive parts.

5.3.3 Residual current protection

5.3.3.1 Residual current protection of AC power supply equipment AC power supply equipment shall be equipped with an independent residual current protector (device) at each charging port, which shall comply with the relevant residual current action characteristics requirements of GB/T 14048.2, or GB/T 16916.1 and GB/T 22794, or GB/T 16917.1 and GB/T 22794. AC power supply equipment shall have one of the following protection measures.

5.5 Overheating and fire

5.5.1 Hazard identification When the power supply equipment is working normally, it shall prevent overheating caused by the following situations, to avoid degradation of electrical, mechanical, insulation or other performance, resulting in danger.

5.5.2 Allowable surface temperature The surface temperature of the EV energy transfer equipment shall not exceed the allowable temperature during operation.

6 General test rules

6.1 General requirements The power supply equipment shall be tested to prove that it meets the relevant requirements of this document. The test items shall be in accordance with the provisions of Table

6. If the components of the power supply equipment have met the relevant standards and are correctly installed and used, there is no need to repeat the inspection of the components during the whole machine test.

6.2.3 Load conditions The AC output port or DC output port of the power supply equipment shall be able to adjust to the maximum rated output power or current; the worst of the two conditions shall be selected for testing. For ports that are intended to be connected to batteries, batteries can be used instead of loads, or batteries and loads can be connected in parallel for testing if the test results may be affected; however, the traceability and reproducibility of the test results need to be evaluated.

6.3 Qualification criteria after applying fault conditions

6.3.1 Protection criteria for electric shock hazards After applying a single fault condition, the power supply equipment shall simultaneously meet the following protection requirements for electric shock hazards.

6.3.2 Criteria for protection against flame spread After applying a single fault condition, the power supply equipment shall not splash molten metal, burning insulating materials, particles burning with or without flames.