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

GB/T 18487.1-2023

Replacing GB/T 18487.1-2015

**Electric vehicle conductive charging system - Part 1: General
requirements**

电动汽车传导充电系统 第1部分：通用要求

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1 Scope

GB/T 18487.1-2023 is the Chinese national standard on electric vehicle conductive charging system - part 1: general requirements, in the field of road vehicles engineering. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 7 September 2023 by

the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 April 2024. Classification: ICS 43.040.99, CCS T35. 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 classification, general requirements, communication, electric shock protection, connection between electric vehicle and EV energy transfer equipment, special requirements of vehicle adaptor, vehicle coupler and EV plug and socket-outlet, EV energy transfer equipment structure requirement, performance requirement, overload protection and short circuit protection, emergency stop, service conditions, repair, marking and description for electric vehicle conductive charging system.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the version corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

GB/T 1002, Single stage plugs and socket-outlets for household and similar purposes - Types, basic parameters and dimensions

GB/T 1003, Single stage plugs and socket-outlets for household and similar purposes - Types, basic parameters and dimensions

GB/T 2099.1, Plugs and socket-outlets for household and similar purposes - Part 1. General requirements

GB/T 2423.3, Environmental testing - Part

3 Terms and definitions

For the purposes of this document, the terms and definitions given in GB/T 19596-2017, GB/T 20234.4-2023, GB/T 29317-2021 and GB/T 32694-2021 as well as those given below apply.

3.1 Charging/bi-directional charging system

3.1.1 charging Powering the rechargeable electrical energy storage system of electric vehicle at a calibrated voltage/current regulated from AC/DC supply network (power supply).

3.1.2 bi-directional charging Adjust the AC or DC power supply network (power supply) to the appropriate voltage/current to provide electric energy for the rechargeable electrical

energy storage system of electric vehicle, or using the electric vehicle as a power supply, adjust the appropriate voltage/current and output it to the AC or DC power supply network (power supply), or provide electric energy to loads, etc.

3.1.3 conductive charge A method of charging the battery using electrical conduction.

[Source: GB/T 19596-2017, 3.4.2.1]

4 Classification

4.1 By input characteristic of supply network By the power supply system it connected to, EV supply equipment is classified into. -- EV supply equipment connected to AC supply network; -- EV supply equipment connected to DC supply network.

4.2 By type of connection of supply network By the type of connection of the supply network it connected to, EV supply equipment is classified into. -- connected using standard plug cable assembly; -- connected fixedly.

4.3 By type of current of energy transfer (side B) By the type of current of energy transfer on side B, EV supply equipment is classified into. -- AC supply equipment; -- DC supply equipment; -- AC/DC supply equipment.

5.1.1 Mode

1 Mode 1 charging system uses standard plug to connect standard socket-outlet and shall adopt single-stage AC power supply not greater than 8 A and 250 V during energy transmission. The plug and socket-outlet conforming to GB 2099.1 and GB 1002 shall be used at the supply side. stage line, neutral line and protective earthing conductor as well as residual current protective device are used at the supply side. Protective earthing conductor shall be provided from standard socket-outlet to electric vehicle. Mode 1 shall not be used to charge electric vehicle.

5.1.2 Mode

2 Mode 2 charging system uses standard plug to connect standard socket-outlet and shall adopt single-stage AC power supply during energy transmission. When 10 A standard plugs and socket-outlets conforming to GB 2099.1 and GB 1002 or NB/T 10202 are used at the supply side, the output shall not exceed 8 A. When plugs and socket-outlets conforming to GB/T 11918.1 and GB/T 11918.2 are used at the supply side, the output shall not exceed 32 A. Single-stage two-pole plugs and socket-outlets specified in GB/T 1002 shall not be used on the power side. Properly installed standard socket-outlets including stage lines, neutral wires and protective earthing conductors shall be used at the power supply side, and in-cable control and protection devices (IC-CPDs) shall be used to connect the power supply network (power supply) and the electric vehicle. It includes plugs that integrate additional functions such as temperature detection, residual current protection, switching,

etc., the rest of which complies with the requirements of the above standards, and meets the test requirements of relevant standards. Protective earthing conductor having residual current protection and overcurrent protection functions shall be provided from standard socket-outlet to electric vehicle. The control pilot function of mode 2 shall comply with Appendix A.

5.1.3 Mode

3 Mode 3 is applicable to that the power supply equipment connected to AC supply network connects electric vehicle and AC supply network and special protection device is installed on EV supply equipment. When EV supply equipment has one or more mode 3 connecting point(s) (EV socket- outlet) that can be used simultaneously, each connecting point shall be provided with special protection device and shall ensure the independent operation of control pilot function. Mode 3 shall be provided with residual current protection function. Case A connection, case B connection and case C connection are applicable to mode 3. When single-stage power supply is adopted, the current shall not be greater than 32 A. When three-stage power supply is adopted and the current is greater than 32A, case C connection shall be adopted.

Note. Applicable to case D connection and case E connection of mode 3, which are under consideration. The control pilot function of mode 3 shall comply with Appendix A.

6 Communication

In mode 4, digital communication shall be adopted to achieve data exchange between electric vehicle and EV supply equipment, and the communication protocol shall comply with GB/T 27930-2023. For modes 2 and 3, digital communication is optional. Digital communication under Modes 2 and 3 can be used for equipment for locations with restricted access, and digital communication requirements for equipment for locations with non-restricted access are under consideration.

7.1 General requirements

7.1.1 General Electric shock is defined as the physiological effect produced by the flow of electric current through a person or domestic animal. The physiological effect may be either harmful (e.g., ventricular fibrillation, heat damages, and suffocation), or harmless (e.g., muscle responses and sensations). Electric shock protective measures under single fault conditions shall be implemented. Under the conditions of intended use and reasonably foreseeable misuse, at least one of the following measures shall be taken to prevent the output circuit of the power supply equipment from electric shock hazards and potential injuries. -- basic protection (see 7.2); -- fault protection (see 7.3); -- complementary measures (see 7.5). Basic protection shall be adopted as the protection under normal operating conditions, and fault protection shall be adopted as the protection under single