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**GB/T 20234.1-2023**  
Replaces GB/T 20234.1-2015

**Connection Set for Conductive Charging of Electric  
Vehicles—Part 1: General Requirements**  
**电动汽车传导充电用连接装置**  
**第 1 部分：通用要求**

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## FOREWORD

This document is drafted in accordance with the rules given in GB/T 1.1-2020 “*Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents*”.

This document is Part 1 of GB/T 20234, *Connection set for conductive charging of electric vehicles*. The following parts of GB/T 20234 have been issued:

- Part 1: General Requirements;
- Part 2: AC Charging Coupler;
- Part 3: DC Charging Coupler;

This document replaces GB/T 20234.1-2015, *Connection set for conductive charging of electric vehicles — Part 1: General Requirements*. In addition to structural adjustments and editorial modifications, the following significant technical deviations have been made with respect to GB/T 20234.1-2015:

- a) Modified the rated voltages and rated currents (See Clauses 1 and 5 vs. Clauses 1 and 5 of GB/T 20234.1-2015);
- b) Added some terms and definitions (See Clause 3 vs. Clause 3 of GB/T 20234.1-2015);
- c) Added the requirements for temperature cycling, cyclic damp heat, thermal management system, liquid cooling device, temperature monitor, locking device, misalignment, contact endurance, charging cable, and in-cable device, and their test methods; modified the requirements for specifications of earthing conductor, provision for earthing, mechanical strength, and normal operation, and their test methods; deleted the requirements for breaking capacity of DC charging coupler (See Clauses 6 and 7 vs. Clauses 6 and 7 of GB/T 20234.1-2015);
- d) Added the inspection requirements, e.g., type inspection program (See Clause 8);
- e) Added Annex B “Reference test devices for temperature rise test” (See Annex B).

*Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. The organizations issuing this document shall not be held responsible for identifying any or all such patent rights.*

This document was proposed by the Ministry of Industry and Information Technology of the People's Republic of China.

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The previous editions of this document are as follows:

- Firstly issued in 2006 as GB/T 20234-2006;
- Firstly revised in 2011 and adjusted as Part 1 of the series of standards, i.e., GB/T 20234.1-2011;
- Secondly revised in 2015;
- This edition is the third revision.

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# INTRODUCTION

Conductive charging is a basic way to supply electric energy to electric vehicles. GB/T 20234 aims to specify the technical requirements and test methods for charging connection set, and to unify the interface types and structural dimensions of charging couplers, so as to realize the interconnectivity and interoperability between electric vehicles and charging infrastructures. GB/T 20234 is intended to be composed of four parts:

- Part 1: General requirements, which aims to establish the general performance requirements for charging connection set to ensure the functionality and reliability of the product.
- Part 2: AC charging coupler, which aims to establish the contact definition, contact connection interfaces, structural dimensions of the AC charging coupler, so as to realize the interchangeability of the AC charging coupler.
- Part 3: DC charging coupler, which aims to establish the contact definition, contact connection interfaces, structural dimensions of the DC charging coupler (including high power charging), so as to realize the interchangeability of DC charging coupler.
- Part 4: High power DC charging coupler, which aims to establish the composition, coupler function and arrangement, cable requirements, thermal management system, technical requirements, and test methods of the DC charging connection set, as well as the definition, technical requirements, test methods, and inspection rules of the adapter.

Considering the charging connection set has a variety of product types, is used in various charging scenarios, encounters complex climatic and environmental conditions, and is subjected to frequent use and operation by users, the charging connection set has become the key to the functionality and reliability of charging. The requirements and specifications for charging connection set given in this document can fully reflect the needs of electric vehicles, charging infrastructures and charging applications for charging connection set.

# Connection Set for Conductive Charging of Electric Vehicles

## — Part 1: General Requirements

### 1 SCOPE

This document specifies the technical requirements for the connection set for conductive charging of electric vehicles, e.g., voltage and current ratings, appearance, structure, environmental adaptability, electrical properties, and mechanical properties, etc., and describes the inspection requirements for the connection set for conductive charging of electric vehicles, e.g., test conditions, test methods, and inspection items, etc.

This document is applicable to the AC charging connection set with a frequency of 50 Hz, a rated voltage not exceeding AC 690V, and a rated current not exceeding 250A for conductive charging of electric vehicles, and to the DC charging connection set with a rated voltage not exceeding DC 1,500V and a rated current (duration maximum current) not exceeding 1,000A.

This document doesn't apply where the plug and socket-outlet of the charging connection set uses the standard plug and socket-outlet specified in GB/T 1002 and GB/T 2099.1.

Additional requirements may be provided in such aspects as mounting position, operating conditions, service mode, and environmental adaptability when the charging connection set specified in this document is intended for the electric vehicles to be used in special occasions, e.g., water infrastructure, mining, construction site, and agricultural operations, or used for other sections than road vehicles.

### 2 NORMATIVE REFERENCES

The following normative documents contain provisions which, through normative reference in this text, constitute essential provision of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendment) applies.

|              |  |
|--------------|--|
| GB/T 261     | Determination of flash point—Pensky-Martens closed cup method  |
| GB/T 1002    | Single phase 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 2423.4  | Environmental testing for electric and electronic products - Part 2: Test method - Test Db: Damp heat, cyclic (12h+12h cycle)  |
| GB/T 2423.7  | Environmental testing - Part 2: Test methods - Test Ec: Rough handling shocks, primarily for equipment—type samples  |
| GB/T 2423.22 | Environmental testing - Part 2: Tests methods - Test N: Change of temperature  |
| GB/T 2951.11 | Common test methods for insulating and sheathing materials of electric and optical cables - Part 11: Methods for general application - Measurement of thickness and overall dimensions - Tests for determining the mechanical properties |
| GB/T 2951.12 | Common test methods for insulating and sheathing materials of electric and optical cables - Part 12: Methods for general application - Thermal ageing methods  |
| GB/T 3956    | Conductors of insulated cables   |
| GB/T 4208    | Degrees of protection provide by enclosure (IP code)   |
| GB 4943.1    | Audio/video, information and communication technology equipment—Part 1: Safety requirements  |

|                       |  |
|-----------------------|--|
| GB/T 5013.4           | Rubber insulated cables of rated voltages up to and including 450/750V - Part 4: Cords and flexible cables                                     |
| GB/T 5023 (all parts) | Polyvinyl chloride insulated cables of rated voltages up to and including 450/750V   |
| GB/T 5461             | Edible salt  |
| GB/T 5462             | Industrial salt  |
| GB/T 5563             | Rubber and plastics hoses and hose assemblies—Hydrostatic testing  |
| GB/T 11918.1-2014     | Plugs, socket-outlets and couplers for industrial purposes—Part 1: General requirements  |
| GB/T 11918.4-2014     | Plugs, socket-outlets and couplers for industrial purposes—Part 4: Switched socket-outlets and connectors with or without interlock            |
| GB/T 14048.5          | Low-voltage switchgear and control gear—Part 5-1: Control circuit devices and switching element—Electromechanical control circuit devices      |
| GB/T 15092.1          | Switches for appliances—Part 1: General requirements   |
| GB/T 16895.3-2017     | Low-voltage electrical installations—Part 5-54: Selection and erection of electrical equipment—Earthing arrangements and protective conductors |
| GB/T 16935.1          | Insulation coordination for equipment within low-voltage supply systems—Part 1: Principles, requirements and tests                             |
| GB/T 18487.1          | Electric vehicle conductive charging system- Part 1: General requirements  |
| GB/T 19596            | Terminology of electric vehicles   |
| GB/T 20234.2          | Connection set for conductive charging of electric vehicles—Part 2: AC charging coupler  |
| GB/T 20234.3          | Connection set for conductive charging of electric vehicles—Part 3: DC charging coupler  |
| GB/T 28046.3-2011     | Road vehicles - Environmental conditions and testing for electrical and electronic equipment - Part 3: Mechanical loads                        |
| GB/T 28046.4-2011     | Road vehicles - Environmental conditions and testing for electrical and electronic equipment - Part 4: Climatic loads                          |
| GB/T 28957.1          | Road vehicles - Test dust for filter evaluation - Part 1: Silicon dioxide test dust  |
| GB/T 29317            | Terminology of electric vehicle charging/battery swap infrastructure   |
| GB/T 33594            | Charging cables for electric vehicles  |

### 3 TERMS AND DEFINITIONS

For the purpose of this document, the terms and definitions established in GB/T 11918.1-2014, GB/T 18487.1, GB/T 19596 and GB/T 29317, as well as the following apply.

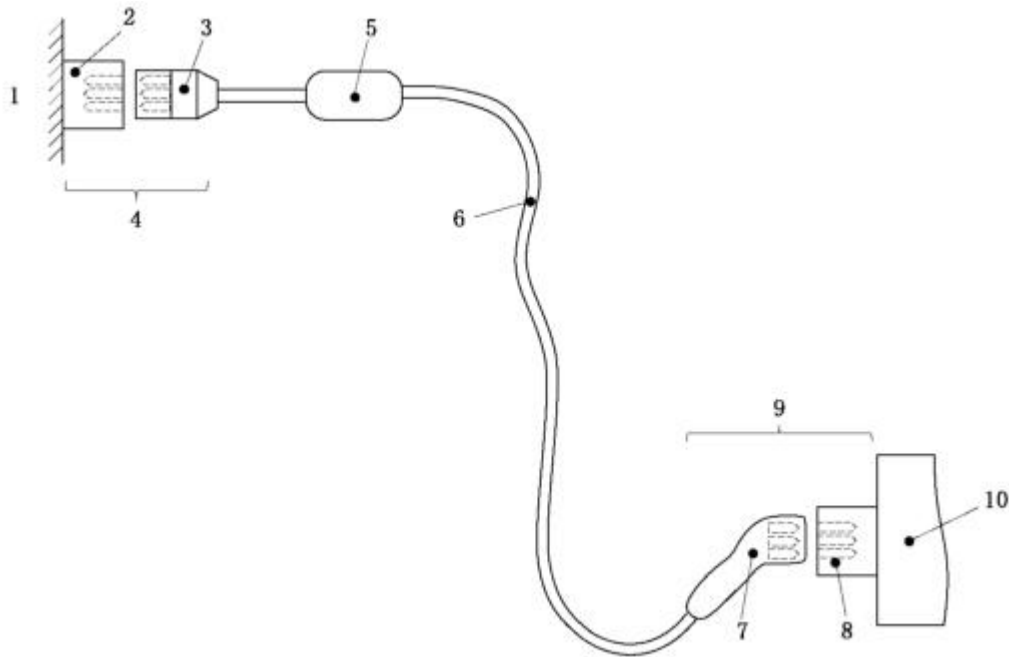
#### 3.1 charging connection set

an assembly or device used for conductive connection between the electric vehicle (EV) and the electric vehicle supply equipment (EVSE) (or external power supply)

Note 1: Charging connection set is capable of making/breaking circuit and realizing transmission of electric energy, low-voltage auxiliary power, control signals or communication data, etc.

Note 2: Charging connection set includes charging coupler, charging cable, in-cable device,

and accessories, e.g., protective cap, etc. The diagram of charging connection set is as shown in Figure 1.



Key

- |   |                                |    |                        |
|---|--------------------------------|----|------------------------|
| 1 | EVSE or external power supply; | 6  | Charging cable;        |
| 2 | Socket-outlet;                 | 7  | Vehicle connector;     |
| 3 | Plug;                          | 8  | Vehicle inlet;         |
| 4 | Plug and socket-outlet;        | 9  | Vehicle coupler;       |
| 5 | In-cable device;               | 10 | Electric vehicle (EV). |

The product design shown in the figure is for illustrative only and doesn't represent the physical product structure.

Figure 1 Diagram of charging connection set

3.2 charging coupler

a subassembly used for enabling and disabling the electrical connection between EV and EVSE (or external power supply)

Note: it is a part of the charging connection set, including the plug and socket-outlet and the vehicle coupler.

3.3 plug and socket-outlet

a subassembly enabling the connection between cable and EVSE or external power supply

Note: it corresponds to the plug and socket-outlet defined in GB/T 11918.1-2014.

3.4 socket-outlet

the fixed part of plug and socket-outlet, which is connected to the external power supply cable or the EVSE

Note: it corresponds to the socket-outlet defined in GB/T 11918.1-2014.

3.5 plug

the movable part of plug and socket-outlet, which is integrated with the charging cable

Note: it corresponds to the plug defined in GB/T 11918.1-2014.



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