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

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Replacing GB/T 32879-2016

Swappable battery pack connector of electric vehicle

电动汽车更换用电池箱连接器

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1 Scope

This document specifies the ratings, service conditions, interchangeability, structure and performance, inspection rules, as well as marking, transportation and storage requirements for swappable battery pack connectors of electric vehicle (hereinafter referred to as the "connectors"), and describes the test methods for these connectors.

This document is applicable to the design, production, testing, and use of swappable battery pack connectors of electric vehicle with a rated voltage not exceeding 1 500 V (DC).

2 Normative References

GB/T 2408

GB/T 2423.17

GB/T 11918.1-2014

GB/T 16935.1-2023

GB/T 19596

GB/T 30038-2013

GB/T 30512

GB/T 41481

3 Terms and Definitions

The terms and definitions defined in GB/T 19596 and the following ones are applicable to this document.

3.1 Swappable Battery Pack Connector

A connection device used to connect a swappable battery pack to the vehicle body or charging rack, facilitating the transmission of electrical energy, electrical signals, communication data, and thermal media.

NOTE. Electrical connectors and fluid connectors are included.

3.2 Connector Plug

The part of the swappable battery pack connector that connects to the battery pack.

3.3 Connector Socket-Outlet

The fixedly installed part of the swappable battery pack connector that connects to the electric vehicle or the battery pack rack at the battery-swapping station.

4.1 The rated operating voltage and rated operating current of electrical connectors should

comply with the provisions of Table 1.

4.2 The rated operating flow rate of fluid connectors should comply with the provisions of Table 2.

Table 2 -- Preferred Values for Rated Operating Flow Rate

5 Service Conditions

The operating environment of the connectors shall meet the following conditions.

- a) Operating ambient temperature. $-40^{\circ}\text{C}\sim 65^{\circ}\text{C}$.
- b) Storage ambient temperature. $-40^{\circ}\text{C}\sim 85^{\circ}\text{C}$.
- c) Relative humidity. Maximum daily average of 95%; maximum monthly average of 90%.
- d) Altitude. Not exceeding 2 000 m; for altitudes exceeding 2 000 m, clearance and creepage distances shall comply with the requirements of GB/T 16935.1-2023.

6.1 Interchangeability Requirements for Electrical Connectors

6.1.1 Electrical connectors of the same type should be interchangeable.

6.1.2 The performance of interchangeable electrical connector combinations shall meet the

requirements of Clause 7.

6.1.3 High-voltage interfaces shall feature 360° annular shielding; this is not required for

dedicated electrical connectors used for conductive connections between charging racks.

6.1.4 Low-voltage interfaces should support two CAN (Controller Area Network) signal

channels-specifically, Charging CAN and Power CAN-with the option to extend to include Diagnostic CAN, etc., as required.

6.1.5 Low-voltage interfaces shall include a terminal for connection status feedback signals.

6.1.6 Low-voltage interfaces should include reserved expandable pins to facilitate compatibility

and expandability.

6.2 Interchangeability Requirements for Fluid Connectors

6.2.1 Fluid connectors of the same type should be interchangeable.

6.2.2 The performance of interchangeable fluid connector combinations shall meet the

requirements of Clause 7.

6.2.3 The opening travel of the internal valve mechanism within the connector shall be consistent, and the valve core sealing method should be radial sealing.

6.2.4 Based on the spring force values involved in the interaction. The force required to fully open the valve mechanism shall be ≤ 200 N (single-channel), and the activation force for the Z- axis floating spring shall be ≥ 350 N.

6.2.5 The cooling medium shall consist of 50% ethylene glycol and 50% water, with all other specifications remaining the same.

6.2.6 The materials used for the fluid connectors shall not undergo chemical reactions with the cooling medium.

7.1.1 Structural requirements for electrical connectors

7.1.1.1 Terminals and surfaces of the electrical connector shall be free from burrs, flash, and similar sharp edges.

7.1.1.2 Insulating liners, partitions, and similar components shall possess sufficient mechanical