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

GB/T 47161-2026

**Railway applications - Rolling stock - Electrical safety for trolley
bus**

轨道交通 机车车辆 无轨电车的电气安全

(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document modifies and adopts IEC 63076:2023 "Safety and reliability of electrical equipment and systems for rail transit vehicles, rolling stock and trolleybuses".

Flow system.

Compared with IEC 63076:2023, this document has undergone the following structural adjustments.

---Added sections 5.2.3, 5.2.4~5.2.8 to correspond to sections 5.2.3~5.2.7 of IEC 63076:2023;

---Figure 9 corresponds to Figure 10 in IEC 63076:2023;

---Figure 10 corresponds to Figure 9 in IEC 63076:2023;

---Appendix A and Appendix B have been added;

---Appendix C corresponds to Appendix A of IEC 63076:2023;

---A.14 of IEC 63076:2023 has been deleted;

---C.14 corresponds to A.15 of IEC 63076:2023;

---Appendix B of IEC 63076:2023 has been deleted.

This document differs significantly from IEC 63076:2023. The relevant clauses are indicated in vertical margins.

Single lines (|) are indicated. A summary of these technical differences and their causes can be found in Appendix A.

The following editorial changes have been made to this document.

---The standard title has been changed to "Electrical Safety of Rail Transit Locomotives, Rolling Stock and Trolleybuses";

---The following has been removed from Chapter 1 of IEC 63076:2023."This international standard specifies relevant requirements and structural recommendations, especially for the public and..." Requirements related to employee protection against electrical hazards. When trolleybuses have special requirements, mechanical and functional safety are specified.

Description of "advice regarding fire prevention, etc.";

---Note 2 in section 3.3 of IEC 63076:2023 has been deleted;

---The relevant provisions for other countries in the notes to IEC 63076:2023 have been deleted (see 4.1.2, 5.1.1, 5.1.10, 5.2.6, 5.2.7, 6.1,...).

6.2.5, 6.5.4.1, A.13);

---Note 5.2.5 in IEC 63076:2023 has been deleted;

---Footnotes 5.1.4, 5.2.4.1, and A.14 in IEC 63076:2023 have been deleted;

---Explanatory descriptions in sections 5.1.7, 5.2.4.2, 6.1, and 6.5.3.4 of IEC 63076:2023 have been removed;

---The title of 5.2.4.4 has been changed to "Resistors";

---Repetitive descriptions in sections 6.2.8 and 6.5.4.4 of IEC 63076:2023 have been removed;

---The description of "perception threshold, pain threshold and danger threshold" in section 6.5.3.1 of IEC 63076:2023 has been deleted;

---The description of "total" current transformers for monitoring has been removed from IEC 63076:2023, section 6.5.3.2;

---Informative Annex B, "Door opening interlocking," of IEC 63076:2023 has been deleted.

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the National Railway Administration.

This document is under the jurisdiction of the National Technical Committee on Standardization of Rail Transit Electrical Equipment and Systems (SAC/TC278).

1 Scope

This document specifies the voltage and voltage level classification, electrical safety requirements, and inspection rules for trolleybuses, and describes the corresponding test methods.

This document applies to the onboard electrical system of trolleybuses, whose nominal

power supply voltage (U_n) is between DC600V and DC750V.

This document applies to trolleybuses and guided vehicles equipped with roof-mounted bipolar current collectors.

This document does not apply to the following vehicles.

a) Electric vehicles with only an internal power supply system.

1) Hybrid vehicles;

2) Internal combustion engine electric transmission vehicles;

3) Fuel cell vehicles;

4) Pure electric vehicles.

b) Vehicles with protective grounding.

1) Rubber-wheeled commuter trains;

2) Independently powered guided buses;

3) Track-guided buses equipped with unipolar current collectors.

c) Vehicles operating outside public areas. electric drive trucks on highways.

This document does not apply to vehicles that use guide rails or flow-receiving rails for flow reception.

The system referred to in this document mainly refers to the electrical insulation and grounding network system.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

GB/T 755 Ratings and Performance of Rotating Electrical Machines (GB/T 755-2025, IEC 60034-1:2022, IDT) GB/T 1402 Voltage of Traction Power Supply System for Rail Transit (GB/T 1402-2025, IEC 60850:2014, MOD) GB/T 3859 (all parts) Semiconductor converters [IEC 60146 (all parts)] Note. GB/T 3859.1-2013 General requirements for semiconductor converters and grid-commutated converters - Part 1-1.Basic requirements (IEC 60146-1-1:2009, MOD) GB/T 3859.2-2013 General requirements for semiconductor converters and grid-commutated converters - Part 1-2.Application guidelines (IEC TR60146-1-2:2011, MOD) GB/T 3859.3-2013 General requirements for semiconductor