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

GB/T 1402-2025

Replacing GB/T 1402-2010

Railway applications - Supply voltages of traction systems

轨道交通 牵引供电系统电压

(English Translation)

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Table of Contents

- Preface
- 1 Scope
- 2 Normative References
- 3 Terms and Definitions
- 4 Traction power supply system voltage and frequency
 - 4.1 Voltage
 - 4.2 Frequency
- 5 Tests
- 6 Test Methods
 - 6.1 Measurement of contact network voltage
 - 6.2 Online Frequency Measurement
- Appendix A (Normative) Maximum Value of Voltage U for Corresponding Duration
- Appendix B (Informative) Voltage Variations, Interruptions, and Distortions
 - B.1 Voltage Sudden Change
 - B.2 Sudden voltage drop in overhead contact line
 - B.3 Short-term voltage interruption
 - B.4 Long-term voltage interruption
 - B.5 Voltage Distortion
 - B.6 Test
- References

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 replaces GB/T 1402-2010 "Voltage of Traction Power Supply System for Rail Transit". Compared with GB/T 1402-2010, except for the structure...

Aside from structural adjustments and editorial changes, the main technical changes are as follows.

a) The "Scope" has been changed, changing the application of electrified transportation in industrial and mining enterprises from applicable to non-applicable, and further subdividing

the urban rail transit classification (see section 1).

Chapter 1 (2010 edition, Chapter 1)

- b) The term "traction substation" has been changed (see 3.18, 2010 edition of 3.18);
- c) The voltage ratings for "Nominal Voltage and Permissible Limits" have been changed (see Table 1, 2010 version of Table 1);
- d) The test method for "Ground Devices" has been changed (see 6.1.2, 2010 version of 6.1.2);
- e) The requirements and methods for "Online Frequency Measurement" have been changed (see 6.2, 2010 edition of 6.2).

This document is modified to adopt IEC 60850:2014 "Voltage of traction power supply systems for rail transit".

Compared with IEC 60850:2014, this document has undergone the following structural adjustments.

---Appendix B of IEC 60850:2014 has been deleted;

---Appendix B corresponds to Appendix C in IEC 60850:2014.

This document differs significantly from IEC 60850:2014 in several technical aspects. The relevant clauses are indicated in vertical margins.

The single line (I) is marked. The specific technical differences and their reasons are as follows.

---The scope has been revised (see Chapter 1) to better reflect my country's national conditions; referencing GB/T 999-2021 and taking into account my country's specific circumstances, the scope of urban areas has been adjusted.

Urban rail transit is being redefined.

---IEC 60038 has been replaced with GB/T 156 (a normative reference), and IEC 60050-811 has been replaced with GB/T 2900.36.[The following text has been deleted.] Normative reference IEC 62128-1:2013 is used to adapt to my country's technical conditions;

---The terms "short-time voltage" and "medium-time voltage" have been added (see 3.7, 3.8) to facilitate the description of the maximum voltage in Zone A and...

Area B;

---Content involving other frequencies has been removed, as my country's power supply frequency is only 50Hz, in accordance with my country's national conditions;

---Content related to voltages not adopted in my country, such as those corresponding to

DC3000V and AC15kV, has been removed to comply with Chinese regulations.

National conditions;

---The relevant content regarding "frequency" has been modified (see 4.2) to conform to the actual situation of power supply management in my country;

---The normative reference GB/T 15945-2008 (see 4.2) has been added to conform to my country's national conditions;

---The voltage testing requirements for ground installations have been modified (see 6.1.2) to adapt to my country's technical conditions;

---The frequency testing methods and requirements have been revised (see Tables 2 and 6.2) to adapt to my country's technical conditions;

---Added content for areas A and B of the maximum voltage (see Appendix A) to refine the specifications for voltage durations;

---Appendix B (Normative) "Optional Values for Traction Power Supply Systems" has been deleted. Voltages specific to foreign situations are not applicable to domestic conditions, in order to conform to our national standards.

National conditions.

The following editorial changes have been made to this document.

---The normative reference IEC 62497-2 has been removed; Figure A.1 already includes the content of areas A and B of IEC 62497-2.

---Added notes to 3.3, 3.10, and Figure A.1.

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 frequency, testing, and testing methods for traction power supply systems.

This document applies to.

---railway;

---Urban rail transit, such as subway systems, light rail systems, straddle-type monorail systems, suspended monorail systems, and automated guided vehicle (AGV) systems.

Tram systems, guided-rail rubber-tired tram systems, and medium- and low-speed maglev systems, etc.

This document is not applicable to.

---Electrified transportation in industrial and mining enterprises (including underground roadway transportation);

---Lifting equipment, conveyor platforms, and similar transportation equipment on tracks; temporary structures (such as exhibition structures), because...

They are not supplied with electricity directly or via transformers through overhead contact lines;

---Suspended cable car.

The content of this document concerning long-duration overvoltages complies with the provisions of Appendix A.

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 156 Standard Voltage (GB/T 156-2017, IEC 60038:2009, MOD) GB/T 2900.36 Electrical Terminology - Electric Traction (GB/T 2900.36-2021, IEC 60050-811:2017, IDT) GB/T 15945-2008 Power Quality - Frequency Deviation of Power Systems GB/T 44991-2025 Test methods for rail transit locomotives and rolling stock before they are put into service after manufacture (IEC 61133:2016, MOD) Note. There are no technical differences between the content referenced in GB/T 44991-2025 and the content referenced in IEC 61133:2016.

3 Terms and Definitions

The terms and definitions defined in GB/T 156 and GB/T 2900.36, as well as the following terms and definitions, apply to this document.

The power distribution network system that provides electrical energy to locomotives and rolling stock.

Note: This system includes.

---Overhead contact system;