



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

GB/T 21414-2021

**Railway applications - Rolling stock - Protective provisions
against electrical hazards**

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foreword

This document is in accordance with the provisions of GB/T 1:1-2020 "Guidelines for Standardization Work Part 1: Structure and Drafting Rules of Standardization Documents"

drafted:

This document replaces GB/T 21414-2008 "Regulations on the Protection of Electrical Hidden Hazards in Railway Application Rolling Stocks", and GB/T 21414-

Compared with:2008, except for structural adjustment and editorial changes, the main technical changes are as follows:

- a) Changed the scope of application of the document (see Chapter 1, Chapter 1 of the:2008 edition);
- b) Some terms and definitions have been changed, and some terms and definitions have been added (see 3:1, Chapter 3 of the:2008 edition);
- c) Added abbreviations (see 3:2);
- d) Deleted the voltage class classification table 2 and table 3 of other countries (see 4:1 of the:2008 edition);
- e) Changed the note in 4:3 to the main text (see 4:3, 4:3 of the:2008 edition);
- f) The reference standard GB/T 21413:1-2008 in insulation protection was changed to GB/T 32350:1, and the nominal working voltage was changed to Rated working voltage (see 5:2, 5:1 of the:2008 edition);
- g) Changed the referenced Chapter 8 to 8:5:2 (see 5:3:1:2, 5:2:1:2 of the:2008 edition);
- h) Changed the protection of the reserved spacing for voltage levels I ~ III (see 5:3:1:3, 5:2:1:3 of the:2008 edition);
- i) Changed the protection of the closed electrical operation area of the voltage level IV (see 5:3:2:1, 5:2:2:1 of the:2008 edition);

- j) Changed the protection of the reserved spacing of voltage class IV (see 5:3:2:2, 5:2:2:2 of the:2008 edition);
- k) Changed the protection using Class I voltage (ELV) (see 5:4, 5:3 of the:2008 edition);
- l) Changed the description of the general requirements for protective measures against indirect contact (see 6:1, 6:1 of the:2008 edition);
- m) Changed the requirements for equipotential bonding (see 6:2:2, 6:2:2 of the:2008 edition);
- n) Changed the content of power cut-off application (see 6:3:1, 6:3:1 of the:2008 edition);
- o) Changed the general requirements for the main protection connection (see 6:4:1, Chapter 6 of the:2008 edition);
- p) changed the connection channel (see 6:4:2, 6:4:2 of the:2008 edition);
- q) Added resistance value calculation requirements (see 6:4:3);
- r) The requirements for parts requiring protective measures have been changed (see 6:5:1, 6:5:1 of the:2008 edition);
- s) Changed the requirements for voltage class II in components that do not require protection (see 6:5:2:2, 6:5:2:1 of the:2008 edition);
- t) Changed the requirements for rubber wheels or suspension systems without protective conductors (see 6:5:5, 6:5:5 of the:2008 edition);
- u) Added additional requirements---bearings (see 6:6);
- v) Changed the general requirements for power circuits (see 7:1, 7:1 of the:2008 edition);
- w) Changed the requirements for current collectors (see 8:2, 8:1 of the:2008 edition);
- x) Changed special power requirements (see 8:5, 8:4 of the:2008 edition);

This document uses the redrafting method to modify and adopt IEC 61991:2019 "Regulations on the Protection of Electrical Hazards of Rail Transit Locomotive Vehicles":

Compared with IEC 61991:2019, this document has made the following structural adjustments:

- 3:1:1:1 corresponds to 3:1:1:3 of IEC 61991:2019;
- 3:1:1:2 corresponds to 3:1:1:1 of IEC 61991:2019;
- 3:1:1:3 corresponds to 3:1:1:2 of IEC 61991:2019;
- 3:1:2:1 corresponds to 3:1:2:15 of IEC 61991:2019;
- 3:1:2:2 corresponds to 3:1:2:14 of IEC 61991:2019;

---3:1:2:3 corresponds to 3:1:2:5 of IEC 61991:2019;
---3:1:2:4 corresponds to 3:1:2:19 of IEC 61991:2019;
---3:1:2:5 corresponds to 3:1:2:27 of IEC 61991:2019;
---3:1:3:1 corresponds to 3:1:2:1 of IEC 61991:2019;
---3:1:3:2 corresponds to 3:1:2:2 of IEC 61991:2019;
---3:1:3:3 corresponds to 3:1:2:3 of IEC 61991:2019;
---3:1:3:4 corresponds to 3:1:2:4 of IEC 61991:2019;
---3:1:3:5 corresponds to 3:1:2:6 of IEC 61991:2019;
---3:1:3:6 corresponds to 3:1:2:7 of IEC 61991:2019;
---3:1:3:7 corresponds to 3:1:2:8 of IEC 61991:2019;
---3:1:3:8 corresponds to 3:1:2:9 of IEC 61991:2019;
---3:1:3:9 corresponds to 3:1:2:10 of IEC 61991:2019;
---3:1:3:10 corresponds to 3:1:2:11 of IEC 61991:2019;
---3:1:3:11 corresponds to 3:1:2:12 of IEC 61991:2019;
---3:1:3:12 corresponds to 3:1:2:13 of IEC 61991:2019;
---3:1:3:13 corresponds to 3:1:2:16 of IEC 61991:2019;
---3:1:3:14 corresponds to 3:1:2:17 of IEC 61991:2019;
---3:1:3:15 corresponds to 3:1:2:18 of IEC 61991:2019;
---3:1:3:16 corresponds to 3:1:2:20 of IEC 61991:2019;
---3:1:3:17 corresponds to 3:1:2:21 of IEC 61991:2019;
---3:1:3:18 corresponds to 3:1:2:22 of IEC 61991:2019;
---3:1:3:19 corresponds to 3:1:2:23 of IEC 61991:2019;
---3:1:3:20 corresponds to 3:1:2:24 of IEC 61991:2019;
---3:1:3:21 corresponds to 3:1:2:25 of IEC 61991:2019;
---3:1:3:22 corresponds to 3:1:2:26 of IEC 61991:2019;
---3:1:3:23 corresponds to 3:1:2:28 of IEC 61991:2019;
--- Appendix A corresponds to Appendix C of IEC 61991:2019;
---Appendix B corresponds to Appendix A of IEC 61991:2019;

--- Deleted Appendix B (informative) of IEC 61991:2019:

There are many technical differences between this document and IEC 61991:2019:

A single line (I) is marked: These technical differences and their reasons are as follows:

--- Regarding normative reference documents, this document has made adjustments with technical differences to adapt to the technical conditions of our country and the circumstances of the adjustment:

The situation is reflected in Chapter 2 "Normative References", and the specific adjustments are as follows:

- * Replace IEC 60529 with GB/T 4208-2017 which is equivalent to adopting international standards (see 5:3:1:1, 5:3:2:1);
- * Replace IEC /T S60479-1 (see 8:5:2) with GB/T 13870:1 which is equivalent to adopting international standards;
- * Replace IEC 61310-1 (see 5:5) with GB/T 18209:1 which is equivalent to adopting international standards;
- * Replacing IEC 62128-1:2013 with GB/T 28026:1-2018 modified to adopt international standards (see 5:3:1:3, 5:3:2:2, 6:4:3, 6:5:5);
- * Replacing IEC 62313 with GB/T 28027 modified to adopt international standards (see 6:2:3, 6:4:2);
- * Replacing IEC 62497-1 with GB/T 32350:1 modified to adopt international standards (see 5:2, 6:5:2:3);
- * Removed IEC 62995:2018 (see 6:2:2):

--- Delete the special country requirements in 4:3, which have nothing to do with my country's national conditions (see 4:3):

--- Increase the terms and conditions that can be negotiated between the supply and demand sides to meet my country's national conditions (see 8:1):

The following editorial changes have been made to this document:

--- Delete the note in 4:1, 6:4:4, 8:4:1;

--- Deleted Note 2 in 6:4:2;

--- Delete the informative Appendix B "Special National Conditions" of IEC 61991:2019:

Please note that some content of this document may be patented: The issuing agency of this document assumes no responsibility for identifying patents: