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

GB/T 25120-2023

Replacing GB/T 25120-2010

**Railway applications - Traction transformers and inductors on
board rolling stock**

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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 replaces GB/T 25120-2010 "Traction transformers and reactors for rail transit rolling stock" and is consistent with GB/T 25120-

Compared with:2010, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

- a) Added the terms impedance voltage, cyclic peak voltage, rated impulse voltage, load curve, tolerance and their definitions (see Chapter 3);
- b) Changed the classification of transformers and reactors (see Chapter 4, Chapter 3 of the:2010 edition);
- c) Added conditions for use (see Chapter 5);
- d) Added load curve and rated current regulations (see Chapter 6);
- e) The grid-side rated voltage has been changed to the nominal voltage of the traction system (see 7:1, 5:1 of the:2010 edition);
- f) Changed the requirements for air-cooled transformers or reactors (see 9:3, 7:3 of the:2010 edition);
- g) Changed the temperature rise limit of the transformer winding of the inflatable unit and increased the temperature limit of the liquid (see Chapter 10,:2010 edition 8:2);
- h) Added the content of mechanical design (see Chapter 11);
- i) Changed the requirements for nameplates (see Chapter 12, Chapter 9 of the:2010

edition);

j) Added the functional inspection, quality, polarity and connection group, insulation resistance, wet dielectric strength test, and terminal voltage withstand test of the transformer:

Test, cable dielectric strength test, partial discharge test, noise measurement under converter power supply, leakage flux density measurement, frequency response

Analyze FRA and other contents (see 13:2:1, 13:2:4, 13:2:6, 13:2:12, 13:2:13, 13:2:14, 13:2:17:3, 13:2:18,

13:2:19);

k) Change the full-wave impulse withstand voltage test to the lightning impulse withstand voltage test (see 13:2:1, 13:3:1, 2010 version of 10:2:1,

10:3:1);

l) Added tolerance provisions for winding resistance and quality, and added content about the fluctuation range of a single winding in impedance value (see 13:2:2);

m) Changed the tolerance of impedance voltage (see 13:2:2, 10:2:2 of the 2010 edition);

n) Changed the preliminary inspection to visual inspection and functional inspection (see 13:2:3, 10:2:1 and 10:3:1 of the 2010 version);

o) Changed the measurement voltage content of no-load current and loss in type inspection (see 13:2:7:2, 10:2:6:1 of the 2010 edition);

p) Added short-circuit impedance calculation requirements (see 13:2:8);

q) Changed the content of total loss measurement (see 13:2:10, 10:2:9 of the 2010 version);

r) Added the temperature rise test of dry-type transformers/reactors (see 13:2:11:3);

s) Changed the dielectric test voltage value (see 13:2:13, 10:2:11 of the 2010 edition);

t) Added power frequency withstand voltage, induction withstand voltage and lightning impulse withstand voltage test wiring diagrams (see 13:2:13:2, 13:2:13:3 and 13:2:13:4);

u) The provisions on short-circuit capacity in short-circuit resistance performance test are deleted (see 10:2:12 of the 2010 edition);

v) The requirements for functional vibration tests for impact and vibration tests have been changed, and the tests that should be repeated after impact and vibration tests have been changed:

Project (see 13:2:16, 10:2:13 of the 2010 version);

w) Added vibration test, short-circuit performance test, noise measurement, leakage flux density measurement, partial discharge test of reactor applied current

test, wet dielectric strength test, insulation resistance test and other tests (see 13:3:1, 13:3:9, 13:3:10, 13:3:12, 13:3:14, 13:3:15, 13:3:16);

x) The mass tolerance of the reactor has been increased, and the content of the deviation of the same reactor has been added (see 13:3:2);

y) The contents of winding resistance and loss tolerance have been changed (see 13:3:2, 10:3:2 of the:2010 edition);

z) Changed the measurement of pulse current reactor and DC reactor to the measurement of incremental inductance and differential inductance, and added micro

Contents of test methods for partial inductance (see 13:3:7:3, 13:3:7:4, 10:3:6:2, 10:3:6:3 of the:2010 edition);

aa) Added test method for withstand voltage test between terminals (see 13:3:10:4):

This document is modified to adopt IEC 60310:2016 "Traction transformers and reactors for rail transit rolling stock":

Compared with IEC 60310:2016, this document has made the following structural adjustments:

---9:3 corresponds to 9:2:3 in IEC 60310:2016;

---Adjusted the internal structure of Chapter 10 and Chapter 12;

---Adjusted the internal structures of 13:2:1, 13:2:8, 13:2:11, 13:2:13:4, 13:2:15 and 13:2:16;

---Table 9~Table 11 correspond to Table 10~Table 12 in IEC 60310:2016, and Table 9 in IEC 60310:2016 is deleted;

---13:2:17 corresponds to 13:2:18 in IEC 60310:2016;

---13:2:18 corresponds to 13:2:19 in IEC 60310:2016;

---13:2:19 corresponds to 13:2:20 in IEC 60310:2016;

---Appendix B corresponds to Appendix E in IEC 60310:2016, and Appendix C corresponds to Appendix D in IEC 60310:2016:

Compared with IEC 60310:2016, this document has many technical differences: The involved clauses are marked with vertical

Single lines (I) are marked: A list of these technical differences and their causes is provided