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

GB/T 21413.4-2023

Replacing GB/T 21413.4-2008

**Railway applications - Electric equipment for rolling stock - Part
4: Electrotechnical components - Rules for AC circuit-breakers**

轨道交通 机车车辆电气设备 第4部分：电工器件 交流断路器规则

(English Translation)

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Table of Contents

Introduction	
1 Scope	
2 Normative references	
3 Terms and Definitions	
3.1 Device	
3.2 Electrical components	
3.3 Operating characteristics	
3.4 Making and breaking characteristics	
4 Abbreviations	
5 Categories	
6 Features	
6.1 Feature List	
6.2 Circuit breaker types	
6.3 Main circuit ratings and limit values	
6.4 Working frequency	
6.5 Electrical control circuit and pneumatic control loop	
6.6 Electrical auxiliary circuit and pneumatic auxiliary circuit	
6.7 Overcurrent release	
6.8 Recovery voltage	
7 Product Information	
8 General conditions of use	
9 Structural and performance requirements	10
9.1 Structural requirements	
9.2 Functional requirements	
9.3 Performance requirements	10
10 Inspection	11
10.1 Inspection classification	
10.2 Verification of structural requirements	
10.3 Type inspection to verify performance requirements	12
10.4 Factory inspection to verify performance requirements	17
Appendix A (informative) Determination of short circuit making and breaking current and DC component percentage	

Appendix B (informative) Test circuit for checking making and breaking capabilities
Reference

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 is Part 4 of GB/T 21413 "Electrical Equipment for Rail Transit Rolling Stocks": GB/T 21413 has been released with Lower part:

- Part 1: General conditions of use and general rules;
- Part 2: General rules for electrical devices;
- Part 3: Rules for DC circuit breakers for electrical devices;
- Part 4: Rules for AC circuit breakers for electrical devices;
- Part 5: Rules for high-voltage fuses for electrical equipment:

This document replaces GB/T 21413.4-2008 "Electrical equipment for railway rolling stock - Part 4: Electrical components for AC disconnection" "Router Rules", compared with GB/T 21413.4-2008, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

- a) Changes in terms and definitions (see Chapter 3, Chapter 3 of the:2008 edition);
- b) Changed the classification of circuit breakers (see Chapter 5, Chapter 4 of the:2008 edition);
- c) The general rules for main circuit ratings and limit values have been changed (see 6.3:1, 5:3:1 of the:2008 edition);
- d) The symbol of the rated voltage has been changed (see 6.3:2, 5:3:2 of the:2008 edition);
- e) The regulations on rated current and rated operating frequency have been changed (see 6.3:3, 6:3:4, 5:3:3, 5:3:4 of the:2008 edition);
- f) Changed the short circuit characteristics (see 6.3:6, 5:3:6 of the:2008 edition);
- g) Changed the characteristics of the overcurrent release (see 6.7, 5:7 of the:2008 edition);
- h) Product information has been changed (see Chapter 7, Chapter 6 of the:2008 edition);
- i) Added functional requirements (see 9.2);
- j) Change the "temperature rise" in the performance requirements to "temperature limit", "dielectric characteristics" to "electrical clearance" and "creepage distance", and "switch

overvoltage" it is "operating overvoltage" (see 9.3:2, 9:3:5, 9:3:6, 9:3:7, 8:2:2, 8:2:6, 8:2:7 of the:2008 edition);

k) Noise requirements are deleted (see 8.2:5, Table 3 of the:2008 version);

l) Changed the work performance requirements (see 9.3:8, 8:2:8 of the:2008 version);

m) Changed the requirements for the trip unit current setting value (see 9.3:11, 9:3:3:7, 9:3:4:7, 9:3:5:4, 9:4:3 of the:2008 edition);

n) Changed the type inspection sequence and items for performance requirement verification (see 10.3:1, 9:3:1 of the:2008 version);

o) The methods of operating limit value test, temperature rise test, dielectric performance test and temperature rise verification in test sequence I have been changed (see 10.3:3:2, 10:3:3:4, 10:3:3:5, 10:3:3:8,:2008 version 9:3:3:1~9:3:3:3, 9:3:3:6);

p) Added main circuit resistance measurement method (see 10.3:3:3, 10:4:6);

q) The main circuit resistance measurement method and the making and breaking capacity test under short circuit conditions in test sequence II have been changed (see 10.3:4:2, 10:3:4:5,:2008 version 9:3:4:1, 9:3:4:4);

r) Change the main circuit resistance verification in test sequence II to temperature rise verification (see 10.3:4:7, 9:3:4:6 of the:2008 edition);

s) Delete the transient recovery voltage test (see 9.3:6 of the:2008 edition);

t) Changed the climatic conditions test method (see 10.3:6, 9:3:7 of the:2008 edition);

u) The content of other tests has been changed (see 10.3:7, 9:3:8 of the:2008 version);

v) The factory inspection items for performance requirement verification have been changed (see 10.4:1, 9:4:1 of the:2008 version):

This document is modified to adopt IEC 60077-4:2019 "Electrical Equipment for Rail Transit Locomotives and Rolling Stocks - Part 4: AC Interruption of Electrical Components" Router Rules:

Compared with IEC 60077-4:2019, this document has made the following structural adjustments:

---Chapter 4 corresponds to 3:5 in IEC 60077-4:2019, and subsequent chapters will be adjusted accordingly;

---Chapter 5 corresponds to Chapter 4 in IEC 60077-4:2019, and subsequent chapters will be adjusted accordingly;

---Added functional requirements (see 9.2), and subsequent chapters will be adjusted accordingly;

---Integrate the requirements for trip unit calibration in 9:3:3:9, 9:3:4:8, 9:3:5:5, and 9:4:3 in IEC 60077-4:2019 into 9:3:11;

---Replaced the positions of Appendix A and Appendix B in the order they appear in the text:

The technical differences between this document and IEC 60077-4:2019 and their reasons are as follows:

---Replaced IEC 62271-102 (see Chapter 4) with the normative reference GB/T 1985, the degree of consistency between the two documents to be modified to adapt to the technical conditions of our country;

---Replaced IEC 60529 (see Chapter 5) with the normatively cited GB/T 4208, and the degree of consistency between the two documents is equal the same, in order to adapt to my country's technical conditions;

---Added the requirement that the circuit resistance value should be provided in the product information (see 7.1): The circuit resistance value is used to determine the contact status of the main contacts of the circuit breaker:

The key parameters of the state are used as the criterion for circuit resistance measurement;

---Deleted the noise-related requirements (see 8.2:5, 9:3:7, Table 3 of IEC 60077-4:2019), because the noise test in IEC 60077-4 is optional, and in actual applications in my country, the background noise when the circuit breaker is working is much higher than the circuit breaker itself:

noise;

--- Added functional requirements (see 9.2) as a criterion for functional verification;

---Replaced IEC 61373 with normative reference GB/T 21563 (see 9.3:5:2, 9:3:5:3), consistency between the two documents the degree is modified to adapt to my country's technical conditions:

The following editorial changes have been made to this document:

---Deleted the annotated content in Chapter 1;

---Correct the error in Table 1: $uc=uc/3$ is $u'=uc/3$;

---Added clauses corresponding to the technical requirements in Table 3;

---References changed:

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