

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Railway Applications – Electric equipment for rolling stock –  
Part 3: Electrotechnical components – Rules for DC circuit-breakers**

**Applications ferroviaires – Équipements électriques du matériel roulant –  
Partie 3: Composants électrotechniques – Règles pour disjoncteurs  
à courant continu**



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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## CONTENTS

FOREWORD .....	4
1 Scope .....	6
2 Normative references .....	7
3 Terms, definitions and abbreviated terms .....	7
3.1 Components .....	7
3.2 Component parts .....	8
3.3 Operational features .....	9
3.4 Breaking characteristics .....	10
3.5 Abbreviated terms .....	12
4 Classification .....	12
5 Characteristics .....	12
5.1 List of characteristics .....	12
5.2 Type of circuit-breaker .....	12
5.3 Rated values and limiting values for the main circuit .....	13
5.3.1 General .....	13
5.3.2 Rated voltages .....	13
5.3.3 Rated currents .....	13
5.3.4 Rated time constants .....	13
5.3.5 Rated short-circuit making and breaking capacity .....	14
5.4 Operational frequencies .....	14
5.5 Electric and pneumatic control circuits .....	14
5.6 Electric and pneumatic auxiliary circuits .....	14
5.7 Overcurrent release .....	14
5.8 Peak arc voltages .....	14
6 Product information .....	14
6.1 Component documentation .....	14
6.2 Marking .....	15
7 Normal service conditions .....	15
8 Constructional and performance requirements .....	15
8.1 Constructional requirements .....	15
8.2 Performance requirements .....	15
8.2.1 Operating conditions .....	15
8.2.2 Temperature limits .....	15
8.2.3 Operation following inactivity .....	15
8.2.4 Electromagnetic compatibility (EMC) .....	15
8.2.5 Acoustic noise emission .....	15
8.2.6 Clearances .....	15
8.2.7 Creepage distances .....	15
8.2.8 Switching overvoltages .....	15
8.2.9 Operational performance capability .....	16
8.2.10 Ability to withstand vibration and shock .....	16
8.2.11 Ability to make and break under short-circuit conditions .....	17
9 Tests .....	17
9.1 Kinds of tests .....	17
9.1.1 General .....	17

9.1.2	Type tests.....	17
9.1.3	Routine tests .....	17
9.1.4	Investigation tests.....	17
9.2	Verification of constructional requirements.....	18
9.2.1	General .....	18
9.2.2	Type tests.....	18
9.2.3	Routine tests .....	18
9.3	Type tests for verification of performance requirements .....	18
9.3.1	Test sequences .....	18
9.3.2	General test conditions .....	19
9.3.3	Test sequence I: General performance characteristics.....	20
9.3.4	Test sequence II: Rated short-circuit making and breaking capacities.....	21
9.3.5	Test sequence III: Ability to withstand vibration and shock.....	23
9.3.6	Test sequence IV: Searching for critical currents .....	24
9.3.7	Test sequence V: Climatic conditions .....	24
9.3.8	Test sequence VI: Other tests.....	24
9.4	Routine tests for verification of performance requirements.....	25
9.4.1	General .....	25
9.4.2	Functional test.....	25
9.4.3	Measurement of resistance.....	25
9.4.4	Calibration of releases.....	25
9.4.5	Air-tightness (for pneumatic circuit-breaker).....	25
9.4.6	Dielectric withstand .....	25
Annex A	(normative) Test circuit to verify the making and breaking capacities .....	26
Annex B	(informative) Verification of short-circuit making and breaking capacities .....	27
Bibliography	.....	29
Figure A.1	– Diagram of the test circuit.....	26
Figure B.1	– Calibration of the circuit to obtain the prospective peak making current .....	27
Figure B.2	– Oscillogram corresponding to a break after the current has passed its maximum value.....	28
Figure B.3	– Oscillogram corresponding to a break before the current has reached its maximum value (current-limiting circuit-breaker).....	28
Table 1	– Rated time constants.....	13
Table 2	– Operational performance capability .....	16
Table 3	– List of type test sequences for performance requirements .....	18
Table 4	– Tolerances on test values.....	19

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**RAILWAY APPLICATIONS –  
ELECTRIC EQUIPMENT FOR ROLLING STOCK –****Part 3: Electrotechnical components –  
Rules for DC circuit-breakers**

## FOREWORD

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International Standard IEC 60077-3 has been prepared by IEC technical committee 9: Electrical equipment and systems for railways.

This second edition cancels and replaces the first edition, issued in 2001. It constitutes a technical revision.

This edition includes the following main technical changes with regard to the previous edition:

- a) procedure of verification of temperature rise is changed;
- b) air-tightness test as type test, insulation resistance measurement are added.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
9/2537/FDIS	9/2553/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

This document should be read in conjunction with IEC 60077-1 and IEC 60077-2.

A list of all parts in the IEC 60077 series, published under the general title *railway applications – Electric equipment for rolling stock*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

## RAILWAY APPLICATIONS – ELECTRIC EQUIPMENT FOR ROLLING STOCK –

### Part 3: Electrotechnical components – Rules for DC circuit-breakers

#### 1 Scope

In addition to the general requirements of IEC 60077-2, this part of IEC 60077 gives the rules for circuit-breakers, the main contacts of which are connected to DC power and/or auxiliary circuits. The nominal voltage of these circuits does not exceed 3 000 V DC according to IEC 60850.

This part of IEC 60077, together with IEC 60077-2, states specifically:

- a) the characteristics of the circuit-breakers;
- b) the service conditions with which circuit-breakers complies with reference to:
  - operation and behaviour in normal service;
  - operation and behaviour in the case of short circuit;
  - dielectric properties;
- c) the tests for confirming the compliance of the components with the characteristics under the service conditions and the methods to be adopted for these tests;
- d) the information to be marked on, or given with, the circuit breaker.

NOTE 1 Circuit-breakers which are dealt with in this document can be provided with devices for automatic opening under predetermined conditions other than those of overcurrent, for example, under-voltage and reversal of power flow direction. This document does not deal with the verification of operation under such predetermined conditions.

NOTE 2 The incorporation of electronic components or electronic sub-assemblies into electrotechnical components is now common practice.

Although this document is not applicable to electronic equipment, the presence of electronic components does not provide a reason to exclude such electrotechnical components from the scope.

Electronic sub-assemblies included in circuit-breakers comply with the relevant document for electronics (IEC 60571).

NOTE 3 Certain of these rules, after agreement between the user and the manufacturer, are used for electro-technical components installed on vehicles other than rail rolling stock such as mine locomotives, trolleybuses, etc. In this case, particular additional requirements can be necessary.

This document does not cover:

- e) multi-connection of electro-technical components to achieve a particular duty;
- f) industrial circuit-breakers which complies with IEC 60947-2;
- g) DC circuit-breakers for fixed installations which complies with IEC 61992-2.

For f) and g), in order to ensure satisfactory operation, this document is used to specify only the particular requirements for rolling stock. In such cases, a specific document states the additional requirements with which the industrial or fixed installations circuits breakers comply, for example:

- either to be adapted (for example, for control voltage, environmental conditions, etc.);
- or to be installed and used in such a way that they do not have to endure specific rolling stock conditions;