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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Railway applications – Electric equipment for rolling stock – Part 1: General service conditions and general rules

Applications ferroviaires – Equipements électriques du matériel roulant – Partie 1: Conditions générales de service et règles générales



IEC 60077-1:2017-07(en-fr)



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Railway applications – Electric equipment for rolling stock – Part 1: General service conditions and general rules

Applications ferroviaires – Equipements électriques du matériel roulant – Partie 1: Conditions générales de service et règles générales

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CONTENTS

FOREWORD 5
INTRODUCTION 7
1 Scope 8
2 Normative references 8
3 Terms, definitions and abbreviated terms (see also Annex A) 9
3.1 General 9
3.2 Circuits 10
3.3 Battery supplied equipment 10
3.4 Test categories 11
3.5 Characteristic quantities 11
3.6 Terms related to lifetime 12
3.7 Abbreviated terms 13
4 Classification 13
5 Characteristics of the utilization category 13
5.1 General 13
5.2 Rated voltages 13
5.2.1 General 13
5.2.2 Rated operational voltage (U_r) 13
5.2.3 Rated insulation voltage (U_{Nm}) 13
5.2.4 Power-frequency test voltage (U_a) 14
5.2.5 Rated impulse voltage (U_{Ni}) 14
5.3 Rated voltages for electric equipment 14
5.3.1 Equipment supplied by a contact line 14
5.3.2 Equipment supplied by a transformer 14
5.3.3 Equipment supplied by DC low voltage sources 14
5.4 Rated currents for equipment 15
5.4.1 Rated operational current (I_r) 15
5.4.2 Rated short-time withstand current (I_{cw}) 15
5.5 Rated operational frequency (f_r) 15
5.6 Rated air pressure 16
6 Product information 16
6.1 Nature of information 16
6.2 Marking 16
6.3 Instructions for storage, installation, operation and maintenance 17
7 Normal service conditions 17
7.1 General 17
7.2 Altitude 17
7.3 Temperature 18
7.3.1 Ambient temperature 18
7.3.2 Reference temperature 18
7.4 Humidity 19
7.5 Biological conditions 19
7.6 Chemically active substances 19
7.7 Mechanically active substances 19
7.8 Vibration and shock 19

7.9 Exposure to pollution 19
7.10 Exposure to overvoltages 19
8 Constructional and performance requirements 19
8.1 Constructional requirements 19
8.1.1 Protective provisions against electrical hazards 19
8.1.2 Batteries 20
8.1.3 Fire protection 20
8.1.4 Other risks 20
8.2 Performance requirements 20
8.2.1 Operating conditions 20
8.2.2 Temperature limits 22
8.2.3 Operation following inactivity 26
8.2.4 Electromagnetic compatibility (EMC) 27
8.2.5 Acoustic noise emission 27
8.2.6 Clearances 27
8.2.7 Creepage distances 27
8.2.8 Switching overvoltages 27
8.2.9 Operational performance 27
8.2.10 Ability to withstand vibration and shock 28
9 Tests 28
9.1 Kinds of tests 28
9.1.1 General 28
9.1.2 Type tests 28
9.1.3 Routine tests 28
9.1.4 Sampling tests 29
9.1.5 Investigation tests 29
9.1.6 General test condition 29
9.1.7 Summary of tests 29
9.2 Verification of constructional requirements 30
9.2.1 General 30
9.2.2 Type tests 30
9.2.3 Routine tests 31
9.3 Verification of performance requirements 31
9.3.1 Operating limits and functional tests 31
9.3.2 Temperature rise test 32
9.3.3 Dielectric properties 35
9.3.4 Operational performance capability 36
9.3.5 Vibration and shock 39
9.3.6 Electromagnetic compatibility (EMC) 39
9.3.7 Acoustic noise emission 39
9.3.8 Climatic tests 39
Annex A (informative) Coordination between definitions 40
Annex B (informative) Type and routine test of dielectric tests for equipment 42
B.1 General 42
B.2 General conditions 42
B.3 Test voltage 42
Annex C (informative) Example of thermal endurance calculation to demonstrate the suitability of an insulation system for a specified application 45

C.1 General 45
C.2 Example 1 – Temperature limits for an electric insulation system 45
C.3 Example 2 – Thermal endurance calculation 46
C.3.1 General 46
C.3.2 Operating conditions provided by the purchaser 46
C.3.3 Thermal endurance characteristics provided by the manufacturer 47
C.3.4 Temperature rise test results 47
C.3.5 Extrapolations 47
C.3.6 Lifetime calculation based on thermal endurance 48
C.3.7 Equivalent continuous duty and rated continuous duty 49
Bibliography 50

Figure A.1 – Example of relation of limiting values 41
Figure A.2 – Example of utilization category 41
Figure A.3 – Example of coordination of operational conditions 41

Table 1 – Voltage ranges for control circuits and auxiliary circuits 15
Table 2 – Classes of air temperatures 18
Table 3 – Temperature limits of electrical insulating system 24
Table 4 – Temperature limits of terminals 25
Table 5 – Temperature limits of accessible parts 26
Table 6 – List of tests (as appropriate) 30
Table B.1 – Dielectric tests on single pieces of equipment 43
Table B.2 – Dielectric tests for equipment connected to AC contact line 44
Table C.1 – Temperature limits and expected lifetime for a dry-type insulation system (examples) 46
Table C.2 – Ambient temperature distribution 47
Table C.3 – Temperature rise test results 47
Table C.4 – Extrapolation to other ambient temperature 48
Table C.5 – Lifetime calculation based on thermal endurance 48
Table C.6 – Equivalent continuous duty and rated continuous duty 49

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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RAILWAY APPLICATIONS – ELECTRIC EQUIPMENT FOR ROLLING STOCK –

Part 1: General service conditions and general rules

FOREWORD

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International Standard IEC 60077-1 has been prepared by IEC technical committee 9: Electrical equipment and systems for railways.

This second edition cancels and replaces the first edition of IEC 60077-1, issued in 1999. It constitutes a technical revision.

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

a) Descriptions regarding insulation coordination, environmental conditions and those of current return and protective bonding are deleted and replaced by references to IEC 62497-1, IEC 62498-1 and IEC 61991, except classes of air temperature, which are copied from Table 2 in IEC 62498-1:2010.
b) Classification of equipment type is introduced.
c) Temperature limits and temperature rise tests are reviewed.

d) Example of lifetime calculation: Annex C (informative) is introduced.

The text of this standard is based on the following documents:

FDIS	Report on voting
9/2266/FDIS	9/2278/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 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 publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

INTRODUCTION

Although this document specifies the general service conditions and general rules for electric equipment for railway rolling stock, further details for certain types of electric equipment may be given in other IEC standards.

IEC 60077 series consists of the following parts:

- Part 1 – General service conditions and general rules
- Part 2 – Electrotechnical components – General rules
- Part 3 – Electrotechnical components – Rules for DC circuit-breakers
- Part 4 – Electrotechnical components – Rules for AC circuit-breakers
- Part 5 – Electrotechnical components – Rules for HV fuses

Although all circuits of power or control electronic equipment connected to battery or contact line are covered by this document, internal circuits of these may be subject to special requirements covered by relevant product standards.

For electric equipment for rolling stock which conforms to an appropriate international standard, including items of industrial equipment, this document, plus the relevant equipment product standard for electric equipment where appropriate, specifies only those additional requirements to ensure satisfactory operation on rolling stock.

RAILWAY APPLICATIONS – ELECTRIC EQUIPMENT FOR ROLLING STOCK –

Part 1: General service conditions and general rules

1 Scope

This part of IEC 60077 specifies the general service conditions and requirements for all electric equipment installed in power circuits, auxiliary circuits, control and indicating circuits etc., on railway rolling stock.

NOTE Some of these rules can, after agreement between the user and the manufacturer, be used for electrical equipment installed on vehicles other than railway rolling stock, such as mine locomotives, trolley buses, etc.

The purpose of this document is to harmonize as far as practicable all rules and requirements of a general nature applicable to electric equipment for rolling stock. This is in order to obtain uniformity of requirements and tests throughout the corresponding range of equipment to avoid the need for testing to different standards.

All requirements relating to:

- the environmental stresses expected during the normal service conditions;
- the construction;
- the performance and the associated tests which can be considered as general;

have therefore been gathered in this document together with specific subjects of wide interest and application, for example temperature rise, dielectric properties, etc.

In the event of there being a difference in requirements between this document and a railway rolling stock relevant product standard, then the product standard requirements take precedence.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-2-1, *Environmental testing – Part 2-1: Tests – Tests A: Cold*

IEC 60068-2-2, *Environmental testing – Part 2-2: Tests – Tests B: Dry heat*

IEC 60068-2-30, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

IEC 60068-2-52, *Environmental testing – Part 2-52: Tests – Test Kb: Salt mist, cyclic (sodium chloride solution)*

IEC 60068-2-78, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

IEC 60085, *Electrical insulation – Thermal evaluation and designation*

IEC 60216-1, *Electrical insulating materials – Thermal endurance properties – Part 1: Ageing procedures and evaluation of test results*

IEC 60505, *Evaluation and qualification of electrical insulation systems*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60721-3-5, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Section 5: Ground vehicle installations*

IEC 60850, *Railway applications – Supply voltages of traction systems*

IEC 61133:2016, *Railway applications – Rolling stock – Testing of rolling stock on completion of construction and before entry into service*

IEC 61373, *Railway applications – Rolling stock equipment – Shock and vibration tests*

IEC 61991, *Railway applications – Rolling stock – Protective provisions against electrical hazards*

IEC 61992-1, *Railway applications – Fixed installations – DC switchgear – Part 1: General*

IEC 62236-3-2, *Railway applications – Electromagnetic compatibility – Part 3-2: Rolling stock – Apparatus*

IEC 62497-1, *Railway applications – Insulation coordination – Part 1: Basic requirements – Clearances and creepage distances for all electrical and electronic equipment*

IEC 62498-1:2010, *Railway applications – Environmental conditions for equipment – Part 1: Equipment on board rolling stock*

3 Terms, definitions and abbreviated terms (see also Annex A)

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1 General

3.1.1
rolling stock
all the vehicles with or without motors

Note 1 to entry: Examples of vehicles include a locomotive, a coach and a wagon.

[SOURCE: IEC 60050-811:2017, 811-02-01]

3.1.2
vehicle
single item of rolling stock