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STN	**Dráhové aplikácie Elektrické zariadenia koľajových vozidiel Časť 1: Všeobecné prevádzkové podmienky a všeobecné pravidlá**	**STN EN 60077-1 34 1510**

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

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 04/18

Obsahuje: EN 60077-1:2017, IEC 60077-1:2017

Oznámením tejto normy sa od 04.09.2020 ruší
STN EN 60077-1 (34 1510) z apríla 2004

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60077-1

November 2017

ICS 45.060.01

Supersedes EN 60077-1:2002

English Version

Railway applications - Electric equipment for rolling stock - Part 1: General service conditions and general rules (IEC 60077-1:2017)

Applications ferroviaires - Equipements électriques du matériel roulant - Partie 1: Conditions générales de service et règles générales
(IEC 60077-1:2017)

Bahnanwendungen - Elektrische Betriebsmittel auf Bahnfahrzeugen - Teil 1: Allgemeine Betriebsbedingungen und allgemeine Regeln
(IEC 60077-1:2017)

This European Standard was approved by CENELEC on 2017-09-04. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN 60077-1:2017 E

EN 60077-1:2017

European foreword

The text of document 9/2266/FDIS, future edition 2 of IEC 60077-1, prepared by IEC/TC 9 "Electrical equipment and systems for railways" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60077-1:2017.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2018-06-04
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2020-09-04

This document supersedes EN 60077-1:2002.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 60077-1:2017 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60071-1	NOTE	Harmonized as EN 60071-1.
IEC 60077-2	NOTE	Harmonized as EN 60077-2.
IEC 60077-3	NOTE	Harmonized as EN 60077-3.
IEC 60077-4	NOTE	Harmonized as EN 60077-4.
IEC 60077-5	NOTE	Harmonized as EN 60077-5.
IEC 60112	NOTE	Harmonized as EN 60112.
IEC 60216-5	NOTE	Harmonized as EN 60216-5.
IEC 60310:2016	NOTE	Harmonized as EN 60310:2016 (not modified).
IEC 60322	NOTE	Harmonized as EN 60322.
IEC 60364-4-41	NOTE	Harmonized as HD 60364-4-41.
IEC 60587	NOTE	Harmonized as EN 60587.
IEC 60664-1	NOTE	Harmonized as EN 60664-1.
IEC 61140	NOTE	Harmonized as EN 61140.
IEC 62271-100:2008	NOTE	Harmonized as EN 62271-100:2009 (not modified).
IEC 62271-100:2008/A1:2012	NOTE	Harmonized as EN 62271-100:2009/A1:2012 (not modified).

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60068-2-1	-	Environmental testing - Part 2-1: Tests - Test A: Cold	EN 60068-2-1	-
IEC 60068-2-2	-	Environmental testing - Part 2-2: Tests - Test B: Dry heat	EN 60068-2-2	-
IEC 60068-2-30	-	Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)	EN 60068-2-30	-
IEC 60068-2-52	-	Environmental testing - Part 2-52: Tests - Test Kb: Salt mist, cyclic (sodium chloride solution)	EN 60068-2-52	-
IEC 60068-2-78	-	Environmental testing - Part 2-78: Tests - Test Cab: Damp heat, steady state	EN 60068-2-78	-
IEC 60085	-	Electrical insulation - Thermal evaluation and designation	EN 60085	-
IEC 60216-1	-	Electrical insulating materials - Thermal endurance properties - Part 1: Ageing procedures and evaluation of test results	EN 60216-1	-
IEC 60505	-	Evaluation and qualification of electrical insulation systems	EN 60505	-
IEC 60529	-	Degrees of protection provided by enclosures (IP Code)	EN 60529	-
IEC 60721-3-5	-	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 5: Ground vehicle installations	EN 60721-3-5	-
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	-	-

EN 60077-1:2017

Publication	Year	Title	EN/HD	Year
IEC 61373	-	Railway applications - Rolling stock equipment - Shock and vibration tests	EN 61373	-
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	-	-

IEC 60077-1

Edition 2.0 2017-07

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)

IEC 60077-1

Edition 2.0 2017-07

INTERNATIONAL STANDARD

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

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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RAILWAY APPLICATIONS – ELECTRIC EQUIPMENT FOR ROLLING STOCK –

Part 1: General service conditions and general rules

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

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*