



SLOVENSKI STANDARD SIST EN 61287-1:2007

01-september-2007

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SIST EN 50207:2001

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Railway applications - Power convertors installed on board rolling stock -- Part 1: Characteristics and test methods (IEC 61287-1:2005)

Bahnanwendungen - Stromrichter auf Bahnfahrzeugen -- Teil 1: Eigenschaften und Prüfverfahren (IEC 61287-1:2005)

Applications ferroviaires - Convertisseurs de puissance embarqués sur le matériel roulant -- Partie 1: Caractéristiques et méthodes d'essais (IEC 61287-1:2005)

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f69b42743f58/sist-en-61287-1-2007

Ta slovenski standard je istoveten z: EN 61287-1:2006

ICS:

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45.060.01	Železniška vozila na splošno	Railway rolling stock in general

SIST EN 61287-1:2007 en,fr,de

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English version

**Railway applications -
Power convertors installed on board rolling stock
Part 1: Characteristics and test methods
(IEC 61287-1:2005)**

Applications ferroviaires -
Convertisseurs de puissance
embarqués sur le matériel roulant
Partie 1: Caractéristiques
et méthodes d'essais
(CEI 61287-1:2005)

Bahnanwendungen -
Stromrichter auf Bahnfahrzeugen
Teil 1: Eigenschaften und Prüfverfahren
(IEC 61287-1:2005)

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This European Standard was approved by CENELEC on 2005-10-01. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 9/864/FDIS, future edition 2 of IEC 61287-1, prepared by IEC TC 9, Electrical equipment and systems for railways, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61287-1 on 2005-10-01.

This European Standard supersedes EN 50207:2000.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2007-07-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2008-10-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61287-1:2005 was approved by CENELEC as a European Standard without any modification.

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Annex ZA
(normative)

**Normative references to international publications
with their corresponding European publications**

The following referenced documents are indispensable for the application 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 When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Where a standard cited below belongs to the EN 50000 series, this European Standard applies instead of the relevant International Standard.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-551	1998	International Electrotechnical Vocabulary (IEV) Part 551: Power electronics	-	-
IEC 60076-10	2001	Power transformers Part 10: Determination of sound levels	EN 60076-10	2001
IEC 60077-1 (mod)	1999	Railway applications - Electric equipment for rolling stock Part 1: General service conditions and general rules	EN 60077-1	2002
IEC 60112	¹⁾	Method for the determination of the proof and the comparative tracking indices of solid insulating materials	EN 60112	2003 ²⁾
IEC 60146-1-1	- ¹⁾	Semiconductor convertors - General requirements and line commutated convertors Part 1-1: Specifications of basic requirements	EN 60146-1-1	1993 ²⁾
IEC 60270	- ¹⁾	High-voltage test techniques - Partial discharge measurements	EN 60270	2001 ²⁾
IEC 60310	- ¹⁾	Railway applications - Traction transformers and inductors on board rolling stock	EN 60310	2004 ²⁾
IEC 60322	- ¹⁾	Railway applications - Electric equipment for rolling stock - Rules for power resistors of open construction	EN 60322	2001 ²⁾
IEC 60349-1 A1	1999 2002	Electric traction - Rotating electrical machines for rail and road vehicles Part 1: Machines other than electronic convertor-fed alternating current motors	EN 60349-1 A1	2000 2002

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60349-2	2002	Electric traction - Rotating electrical machines for rail and road vehicles Part 2: Electronic convertor-fed alternating current motors	EN 60349-2 ³⁾	2001
IEC 60384	Series	Fixed capacitors for use in electronic equipment	EN 60384	Series
IEC 60384-4	- ¹⁾	Fixed capacitors for use in electronic equipment Part 4: Sectional specification: Aluminium electrolytic capacitors with solid and non-solid electrolyte	-	-
IEC 60529	- ¹⁾	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May	1991 ²⁾ 1993
IEC 60571	- ¹⁾	Electronic equipment used on rail vehicles	EN 50155 + A1	2001 ²⁾ 2002
IEC 60587	- ¹⁾	Test method for evaluating resistance to tracking and erosion of electrical insulating materials used under severe ambient conditions	HD 380 S2	1987 ²⁾
IEC 60664-1 (mod)	- ¹⁾	Insulation coordination for equipment within low-voltage systems Part 1: Principles, requirements and tests	EN 60664-1	2003 ²⁾
IEC 60747	Series	Semiconductor devices		-
IEC 60850	- ¹⁾	Railway applications - Supply voltages of traction systems	EN 50163	2004 ²⁾
IEC 61148	- ¹⁾	Terminal markings for valve device stacks and assemblies and for power convertor equipment	-	-
IEC 61373	- ¹⁾	Railway applications - Rolling stock equipment - Shock and vibration tests	EN 61373	1999 ²⁾
IEC 61881	- ¹⁾	Railway applications - Rolling stock equipment - Capacitors for power electronics	EN 61881	1999 ²⁾
IEC 61991	2000	Railway applications - Rolling stock - Protective provisions against electrical hazards	EN 50153	2002
IEC 62236-3-1	- ¹⁾	Railway applications - Electromagnetic compatibility Part 3-1: Rolling stock - Train and complete vehicle	EN 50121-3-1	2006 ²⁾

³⁾ EN 60349-2:2001 (IEC 60349-2:1993, mod.) corresponds to IEC 60349-2:2002.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 62236-3-2	- ¹⁾	Railway applications - Electromagnetic compatibility Part 3-2: Rolling stock - Apparatus	EN 50121-3-2	2006 ²⁾
IEC 62278	- ¹⁾	Railway applications - Specification and demonstration of reliability, availability, maintainability and safety (RAMS)	EN 50126-1 + corr. May	1999 2006
ISO 9001	2000	Quality management systems - Requirements	EN ISO 9001	2000

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**NORME
INTERNATIONALE
INTERNATIONAL
STANDARD**

**CEI
IEC**

61287-1

Deuxième édition
Second edition
2005-09

**Applications ferroviaires –
Convertisseurs de puissance embarqués
sur le matériel roulant –**

**Partie 1:
Caractéristiques et méthodes d'essais**

(standards.iteh.ai)

**Railway applications –
Power converters installed
on board rolling stock –**

**Part 1:
Characteristics and test methods**

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

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Pour prix, voir catalogue en vigueur
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CONTENTS

FOREWORD.....	7
1 Scope.....	11
2 Normative references.....	13
3 Terms and definitions	15
3.1 Definitions related to equipment.....	15
3.2 Definitions related to electrical parameters.....	21
4 Common clauses	23
4.1 General	23
4.2 Service conditions	27
4.3 Characteristics	39
4.4 Technical requirements.....	43
4.5 Tests.....	47
5 Direct traction convertors	71
5.1 Line-commutated convertors for d.c. motors	71
5.2 Choppers for d.c. motors	77
5.3 Multiphase convertors for a.c. motors (inverters).....	83
6 Indirect traction convertors.....	85
6.1 Line convertor.....	85
6.2 Motor convertor	89
7 Auxiliary convertors.....	89
7.1 Characteristics	89
7.2 Short-circuit protection.....	93
7.3 Choice of rated insulation voltage	93
7.4 Tests.....	93
8 Semiconductor drive units (SDU)	99
8.1 Equivalent expressions	99
8.2 Printed circuit board assemblies	99
8.3 Function of the SDU	99
8.4 Particular requirements for the SDU.....	99
8.5 Service conditions	101
8.6 Insulation requirements for the SDU.....	101
8.7 Electromagnetic compatibility requirements.....	101
8.8 Tests of the SDU	101
Annex A (normative) Arrangement of basic circuit diagrams	103
Annex B (informative) Recapitulation of agreements between the manufacturer and the user	105
Annex C (normative) Minimum clearances in air based on the rated impulse voltage U_{ni}	109
Annex D (normative) Minimum creepage distances for low values of rated insulation voltage U_{nm} for materials other than printed wiring material	111
Annex E (normative) Definition of pollution degrees	115

Annex F (normative) Dielectric tests for equipment – Short-duration power-frequency (a.c.) test levels U_a (kV r.m.s.) based on the rated impulse voltage U_{Ni} (kVcr)	117
Annex G (normative) Rated impulse voltages U_{Ni} for circuits powered by the contact line.....	119
Annex H (informative) Guidelines for magnetic field and induced voltage requirements	121

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SIST EN 61287-1:2007

<https://standards.iteh.ai/catalog/standards/sist/8bfl-dd02-4005-44b3-9844-f69b42743f58/sist-en-61287-1-2007>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**RAILWAY APPLICATIONS –
POWER CONVERTORS INSTALLED ON
BOARD ROLLING STOCK –****Part 1: Characteristics and test methods**

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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- 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 61287-1 has been prepared by IEC technical committee 9: Electrical equipment and systems for railways.

This second edition cancels and replaces the first edition published in 1995. This edition constitutes a technical revision.

This edition includes the following technical changes from the previous edition: it includes updates as necessary in order to meet the current technical state of the art and to improve clarity. It also takes into account generic railway standards as relevant parts of IEC 62236 and IEC 62278 series and general railway technical standards as IEC 60850 and relevant parts of IEC 60077, IEC 60349 and IEC 61377 series. This revision has been drafted with considerations of harmonization with EN 50207 (1998).

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

FDIS	Report on voting
9/864/FDIS	9/872/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.

The IEC 61287 series contains the following parts under the general title *Railway applications – Power converters installed on board rolling stock*:

Part 1: Characteristics and test methods

Part 2: Additional technical information

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site 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.

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RAILWAY APPLICATIONS – POWER CONVERTORS INSTALLED ON BOARD ROLLING STOCK –

Part 1: Characteristics and test methods

1 Scope

This International Standard is applicable to power electronic convertors mounted on board railway rolling-stock and intended for supplying

- traction circuits;
- auxiliary circuits of power vehicles, coaches and trailers.

The application of this standard extends as far as possible to all other traction vehicles, including trolley-buses, for example.

This standard covers the complete convertor assembly together with its mounting arrangements containing

- semiconductor device assemblies,
- integrated cooling systems;
- components of the intermediate d.c. link, including any necessary filters associated with the d.c. link;
- semiconductor drive units (SDU) and related sensors;
- incorporated protection circuits.

The following types of power sources are taken into consideration:

- a.c. contact lines,
- d.c. contact lines,
- on-board supplies such as generators, batteries and other electric power sources.

This standard excludes convertors which provide the electronic control supply for SDU and other supplies relevant to the convertor operation such as sensors.

NOTE Electronic control equipment of convertors and those sensors not related to semiconductor drive units and the printed circuit board assemblies of drive units for power semiconductors (SDU) are covered by IEC 60571.

This standard defines terminology, service conditions, general characteristics and test methods of electronic power convertors onboard of rolling stock.

2 Normative references

The following referenced documents are indispensable for the application 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 60050-551:1998, *International Electrotechnical Vocabulary (IEV) – Part 551: Power electronics*

IEC 60076-10:2001, *Power transformers – Part 10: Determination of sound levels*

IEC 60077-1:1999, *Railway applications – Electric equipment for rolling stock – Part 1: General service conditions and general rules*

IEC 60112, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

IEC 60146-1-1, *Semiconductor convertors – General requirements and line commutated convertors – Part 1-1: Specifications of basic requirements*

IEC 60270, *High-voltage test techniques – Partial discharge measurements*

IEC 60310, *Railway applications – Traction transformers and inductors on board rolling stock*

IEC 60322, *Railway applications – Electric equipment for rolling stock – Rules for power resistors of open construction*

IEC 60349-1:1999, *Electric traction – Rotating electrical machines for rail and road vehicles – Part 1: Machines other than electronic convertor-fed alternating current motors*
Amendment 1 (2002)

IEC 60349-2:2002, *Electric traction – Rotating electrical machines for rail and road vehicles – Part 2: Electronic convertor-fed alternating current motors*

IEC 60384 (all parts), *Fixed capacitors for use in electronic equipment*

IEC 60384-4, *Fixed capacitors for use in electronic equipment – Part 4: Sectional specification – Aluminium electrolytic capacitors with solid and non-solid electrolyte*

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

IEC 60571, *Electronic equipment used on rail vehicles*