

Railway applications - Power converters installed on board rolling stock - Part 1: Characteristics and test methods

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English Version

Railway applications - Power converters installed on board rolling stock - Part 1: Characteristics and test methods (IEC 61287-1:2014)

Applications ferroviaires - Convertisseurs de puissance embarqués sur le matériel roulant - Partie 1: Caractéristiques et méthodes (CEI 61287-1:2014)

Bahnanwendungen - Stromrichter auf Bahnfahrzeugen - Teil 1: Eigenschaften und Prüfverfahren (IEC 61287-1:2014)

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European Committee for Electrotechnical Standardization
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Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Foreword

The text of document 9/1918/FDIS, future edition 3 of IEC 61287-1, 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 61287-1:2014.

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) 2015-05-14
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2017-08-14

This document supersedes EN 61287-1:2006.

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Endorsement notice

The text of the International Standard IEC 61287-1:2014 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 60112	NOTE	Harmonized as EN 60112.
IEC 60146-1-1	NOTE	Harmonized as EN 60146-1-1.
IEC 60216	NOTE	Harmonized in EN 60216 series (not modified).
IEC 60384-1	NOTE	Harmonized as EN 60384-1.
IEC 60587	NOTE	Harmonized as EN 60587.
IEC 60664-1:2007	NOTE	Harmonized as EN 60664-1:2007 (not modified).
IEC 60747-15	NOTE	Harmonized as EN 60747-15.
IEC 61377-1	NOTE	Harmonized as EN 61377-1.
IEC 61377-2	NOTE	Harmonized as EN 61377-2.
IEC 61377-3	NOTE	Harmonized as EN 61377-3.
IEC 62520	NOTE	Harmonized as EN 62520.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<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 60050-811	1991	International electrotechnical vocabulary (IEV) - Chapter 811: Electric traction	-	-
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 60270	-	High-voltage test techniques - Partial discharge measurements	EN 60270	-
IEC 60310	-	Railway applications - Traction transformers and inductors on board rolling stock	EN 60310	-
IEC 60322	-	Railway applications - Electric equipment for rolling stock - Rules for power resistors of open construction	EN 60322	-
IEC 60349-1	-	Electric traction - Rotating electrical machines for rail and road vehicles - Part 1: Machines other than electronic converter-fed alternating current motors	EN 60349-1	-
IEC 60349-2	-	Electric traction - Rotating electrical machines for rail and road vehicles - Part 2: Electronic converter-fed alternating current motors	EN 60349-2	-
IEC 60349-4	-	Electric traction - Rotating electrical machines for rail and road vehicles - Part 4: Permanent magnet synchronous electrical machines connected to an electronic converter	EN 60349-4	-

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60384-4	-	Fixed capacitors for use in electronic equipment - Part 4: Sectional specification - Aluminium electrolytic capacitors with solid (MnO ₂) and non-solid electrolyte	EN 60384-4	-
IEC 60529	-	Degrees of protection provided by enclosures (IP Code)	EN 60529	-
IEC 60571	-	Railway applications - Electronic equipment used on rolling stock	-	-
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 60747	series	Semiconductor devices	EN 60747	series
IEC 60850	-	Railway applications - Supply voltages of traction systems	-	-
IEC 61148	-	Terminal markings for valve device stacks and assemblies and for power conversion equipment	EN 61148	-
IEC 61373	-	Railway applications - Rolling stock equipment - Shock and vibration tests	EN 61373	-
IEC 61881	series	Railway applications - Rolling stock equipment - Capacitors for power electronics	EN 61881	series
IEC 61991	-	Railway applications - Rolling stock - Protective provisions against electrical hazards	-	-
IEC 62236-3-1	-	Railway applications - Electromagnetic compatibility - Part 3-1: Rolling stock - Train and complete vehicle	-	-
IEC 62236-3-2	-	Railway applications - Electromagnetic compatibility - Part 3-2: Rolling stock - Apparatus	-	-
IEC 62278	-	Railway applications - Specification and demonstration of reliability, availability, maintainability and safety (RAMS)	-	-
IEC 62497-1 + A1	2010 2013	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	-	-

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RAILWAY APPLICATIONS – POWER CONVERTERS INSTALLED ON BOARD ROLLING STOCK –

Part 1: Characteristics and test methods

1 Scope

This part of IEC 61287 defines terminology, service conditions, general characteristics and test methods of electronic power converters onboard of rolling stock.

This International Standard is applicable to power electronic converters 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 converter assembly together with its mounting arrangements containing

- semiconductor device assemblies;
- integrated cooling systems;
- integrated components like inductors, capacitors, transformers, resistors, contactors, switches;
- semiconductor drive units (SDU) and related sensors;
- incorporated protection circuits.

The following types of power sources are taken into consideration:

- AC contact lines,
- DC contact lines,
- on-board supplies such as generators, batteries and other electric power sources.

This standard excludes converters which provide the electronic control supply for semiconductor drive units (SDU) and other supplies relevant to the converter operation such as sensors.

NOTE 1 Electronic control equipment of converters and those sensors not related to semiconductor drive units and the printed circuit board assemblies of semiconductor drive units (SDU) are covered by IEC 60571.

NOTE 2 Combined tests with the whole traction system or auxiliary supply system are not within the scope of this standard. E.g. rules for combined tests of a motor fed by a converter are given in the IEC 61377 series.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.