Railway applications - Rolling stock - Electrical connectors - Requirements and test methods

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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IEC 60068-2-31:2008	NOTE	Approved as EN 60068-2-31:2008 (not modified)
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IEC 60512-11-10:2002	NOTE	Approved as EN 60512-11-10:2002 (not modified)
IEC 60512-13-1:2006	NOTE	Approved as EN 60512-13-1:2006 (not modified)
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IEC 60512-15-2	NOTE	Approved as EN IEC 60512-15-2
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NORME INTERNATIONALE

colour inside

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Applications ferroviaires – Matériel roulant – Connecteurs électriques – Exigences et méthodes d'essai

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INTERNATIONAL STANDARD

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Railway applications – Rolling stock – Electrical connectors – Requirements and test methods

Applications ferroviaires – Matériel roulant – Connecteurs électriques – Exigences et méthodes d'essai

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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RAILWAY APPLICATIONS – ROLLING STOCK – ELECTRICAL CONNECTORS – REQUIREMENTS AND TEST METHODS

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International Standard IEC 62847 has been prepared by IEC technical committee 9: Electrical equipment and systems for railways.

EN 50467:2011 has served as a basis for the elaboration of this standard.

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

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

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INTRODUCTION

This International Standard provides performance requirements and tests for low-voltage electrical connectors intended to be installed on board rolling stock, either inside or outside. Safety requirements and tests for electrical connectors are already covered in general by IEC 61984:2008. The additional requirements and testing of specific characteristics demanded by rolling stock applications are set out in this International Standard. One goal of this International Standard is to avoid retesting of electrical connectors already in compliance with IEC 61984:2008 for those characteristics that have been assessed suitable also for use on board rolling stock.

Among the additional requirements for use on board rolling stock, those that can be verified by documentation of tests on the raw materials are distinguished from those to be assessed by tests on the component.

Due to the wide spectrum of existing and future specific rolling stock applications of electrical connectors, this International Standard does not select any particular geometric configuration of connectors, nor establish any particular values for electrical ratings such as voltage and current, or for any other characteristic. All such details should be selected and agreed between the parties involved (e.g. manufacturer and user) depending on the electrical, mechanical and environmental conditions expected in the intended use. Annexes A and C of this International Standard provide guidance.

Upon agreement between the parties involved, this International Standard may be used in conjunction with existing connector detail specifications for interchangeability purposes.

Specific standards based on this generic International Standard may be developed in the future to address particular connector requirements and designs, for instance, to fix dimensions for interchangeability and to set additional requirements for specific applications that, due to complexity and variety, are left here to agreement between parties involved.

RAILWAY APPLICATIONS – ROLLING STOCK – ELECTRICAL CONNECTORS – REQUIREMENTS AND TEST METHODS

1 Scope

This International Standard retains IEC 61984:2008 as the minimum performance requirements for railway rolling stock electrical connectors.

It identifies additional terms, test methods and performance requirements for single-pole and multipole connectors with rated voltages up to 1 000 V, rated currents up to 125 A per contact and frequencies below 3 MHz used for indoor and outdoor applications in railway rolling stock.

This International Standard does not cover:

- connectors with breaking capacity (CBCs) as defined in IEC 61984:2008, 3.2, because on board rolling stock connectors are not intended to be operated (i.e. mated and unmated) under load or when live, either by means of procedures or by the presence of interlocks, as required by IEC 61991;
- non-rewirable connectors as defined in IEC 61984:2008, 3.5;
- automatic couplers, due to their additional mechanical complexity and the need for more specific requirements and testing;
- inter-vehicle jumpers, as they are connector and cable assemblies whose characteristics depend on those of both elements. Inter-vehicle connectors within the limits set in the scope of this International Standard are therefore covered by the agreed choice of suitable mechanical and environmental characteristics as defined by Annex B, and suggested by Annex C.

This International Standard identifies the application levels for electrical connectors based on

a) the severity of the service conditions in different rolling stock technologies,

b) the intended use of the rolling stock,

c) the location of the connector in the rolling stock system.

This International Standard is not applicable to internal connections of electronic devices such as connectors for printed boards and rack-and-panel connectors.

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.

IEC 60050-581, *International Electrotechnical Vocabulary – Part 581: Electromechanical components for electronic equipment* (available at: http://www.electropedia.org)

IEC 60060-1:2010, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60068-1, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-70:1995, *Environmental testing – Part 2-70: Tests – Test Xb: Abrasion of markings and letterings caused by rubbing of fingers and hands*

IEC 60309-1:1999, *Plugs, socket-outlets and couplers for industrial purposes – Part 1: General requirements*

IEC 60352-2:2006, *Solderless connections – Part 2: Crimped connections – General requirements, test methods and practical guidance*
IEC 60352-2:2006/AMD1:2013

IEC 60352-3, *Solderless connections – Part 3: Solderless accessible insulation displacement connections – General requirements, test methods and practical guidance*

IEC 60352-4, *Solderless connections – Part 4: Solderless non-accessible insulation displacement connections – General requirements, test methods and practical guidance*

IEC 60352-5, *Solderless connections – Part 5: Press-in connections – General requirements, test methods and practical guidance*

IEC 60352-6, *Solderless connections – Part 6: Insulation piercing connections – General requirements, test methods and practical guidance*

IEC 60352-7, *Solderless connections – Part 7: Spring clamp connections – General requirements, test methods and practical guidance*

IEC 60417, *Graphical symbols for use on equipment* (available at: http://www.graphical-symbols.info/equipment)

IEC 60512-1:2001, *Connectors for electronic equipment – Tests and measurements – Part 1: General*

IEC 60512-1-1:2002, *Connectors for electronic equipment – Tests and measurements – Part 1-1: General examination – Test 1a: Visual examination*

IEC 60512-4-1:2003, *Connectors for electronic equipment – Tests and measurements – Part 4-1: Voltage stress tests – Test 4a: Voltage proof*

IEC 60512-5-1:2002, *Connectors for electronic equipment – Tests and measurements – Part 5-1: Current-carrying capacity tests –Test 5a: Temperature rise*

IEC 60512-11-6:2002, *Connectors for electronic equipment – Tests and measurements – Part 11-6: Climatic tests – Test 11f: Corrosion, salt mist*

IEC 60512-11-7:2003, *Connectors for electronic equipment – Tests and measurements – Part 11- 7: Climatic tests – Test 11g: Flowing mixed gas corrosion test*

IEC 60512-13-5, *Connectors for electronic equipment – Tests and measurements – Part 13-5: Mechanical operation tests – Test 13e: Polarizing and keying method*

IEC 60512-19-3:1997, *Electromechanical components for electronic equipment – Basic testing procedures and measuring methods – Part 19: Chemical resistance tests – Section 3: Test 19c – Fluid resistance*

IEC 60512-23-3:2000, *Electromechanical components for electronic equipment – Basic testing procedures and measuring methods – Part 23-3: Test 23c: Shielding effectiveness of connectors and accessories*

IEC 60512-23-4:2001, *Connectors for electronic equipment – Tests and measurements – Part 23-4: Screening and filtering tests – Test 23d: Transmission line reflections in the time domain*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*
IEC 60529:1989/AMD1:1999
IEC 60529:1989/AMD2:2013

IEC 60664-1:2007, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60999-1:1999, *Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units – Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm^2 up to 35 mm^2 (included)*

IEC 60999-2:2003, *Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units – Part 2: Particular requirements for clamping units for conductors above 35 mm^2 up to 300 mm^2 (included)*

IEC 61210, *Connecting devices – Flat quick-connect terminations for electrical copper conductors – Safety requirements*

IEC 61373:2010, *Railway applications – Rolling stock equipment – Shock and vibration tests*

IEC 61984:2008, *Connectors – Safety requirements and tests*

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

IEC 62497-1:2010, *Railway applications – Insulation coordination – Part 1: Basic requirements – Clearances and creepage distances for all electrical and electronic equipment*

ISO 1431-1:2012, *Rubber, vulcanized or thermoplastic – Resistance to ozone cracking – Part 1: Static and dynamic strain testing*

ISO 4892-2:2013, *Plastics – Methods of exposure to laboratory light sources – Part 2: Xenon-arc lamps*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-581:2008 and the following apply.

3.1
connection
two mated connectors or contacts

EXAMPLE See Figure 1.