

**Konnektorid. Ohutusnõuded ja katsed**

Connectors - Safety requirements and tests

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## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 61984:2009 sisaldab Euroopa standardi EN 61984:2009 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 31.07.2009 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 26.06.2009.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN 61984:2009 consists of the English text of the European standard EN 61984:2009.

This standard is ratified with the order of Estonian Centre for Standardisation dated 31.07.2009 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

Date of Availability of the European standard text 26.06.2009.

The standard is available from Estonian standardisation organisation.

ICS 31.220.10

**Võtmesõnad:** insp, low voltage, parameters, plug-and-socket connection, polypole, power installations, protection against electric shocks, ratings, safety, safety requirements, single-pole, solderless connections, specification (approval), specifications, test programs, testing

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English version

**Connectors -  
Safety requirements and tests  
(IEC 61984:2008)**

Connecteurs -  
Exigences de sécurité et essais  
(CEI 61984:2008)

Steckverbinder -  
Sicherheitsanforderungen und Prüfungen  
(IEC 61984:2008)

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**CENELEC**

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

**Central Secretariat: Avenue Marnix 17, B - 1000 Brussels**

## Foreword

The text of document 48B/1927/FDIS, future edition 2 of IEC 61984, prepared by SC 48B, Connectors, of IEC TC 48, Electromechanical components and mechanical structures for electronic equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61984 on 2009-06-01.

This European Standard supersedes EN 61984:2001.

EN 61984:2009 includes the following significant technical changes with respect to EN 61984:2001:

- addition in the scope of the statement that this standard may be used as a guide for connectors with rated current higher than 125 A per pole;
- new definitions added and improvement of existing definitions;
- in Clause 5, the classification referred to protection against electric shock and that of connector for class II equipment were added;
- in 6.4 (Protection against electric shock), it is clarified that all parts which are necessary to ensure protection against electric shock shall only be removable by the aid of a tool;
- Table 2 and Table 3 are added for better readability and connecting methods updated to current status of standardization;
- values for cable clamp testing in Table 6 are adopted according to EN 50262 and no tests are required if metric cable glands according to this standard are used;
- tables in 6.19 are deleted and the text refers to EN 60664;
- Table 7 (Values for torque for screw-type clamping units) in 7.1.4 of EN 61984:2001 is deleted and the text refers to the relevant standards;
- Subclause 7.3.7 of EN 61984:2001 is modified. In 7.3.8 of EN 61984:2009, the length of the connecting cable and conductor loops are added. Test arrangements for temperature rise test for two-part printed board connectors are fixed;
- Figure 2 (Device for bending test) transferred from 7.3.8 (Mechanical operation) of EN 61984:2001 to 7.3.10 (Bending (flexing) test) of EN 61984:2009;
- in Table 10 (Mechanical test group A) test phase A3, the severity or conditions for unenclosed and enclosed connectors are specified;
- the informative Annex B (Additional information on connector classification) with its Tables B.1 (Scheme of connectors) and B.2 (Help for the classification of connectors) are added for better readability of the standard.

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) 2010-03-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2012-06-01

Annex ZA has been added by CENELEC.

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### Endorsement notice

The text of the International Standard IEC 61984:2008 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 60068-2-20 + A2	NOTE Harmonized as HD 323.2.20 S3:1988 (not modified).
IEC 60112	NOTE Harmonized as EN 60112:2003 (not modified).
IEC 60364-5-54	NOTE Harmonized as HD 60364-5-54:2007 (modified).
IEC 60423	NOTE Harmonized as EN 60423:2007 (not modified).
IEC 60695-2-12	NOTE Harmonized as EN 60695-2-12:2001 (not modified).
IEC 60695-10-2	NOTE Harmonized as EN 60695-10-2:2003 (not modified).
IEC 60695-11-5	NOTE Harmonized as EN 60695-11-5:2005 (not modified).
IEC 60998-2-1	NOTE Harmonized as EN 60998-2-1:2002 (modified).
IEC 60998-2-2	NOTE Harmonized as EN 60998-2-2:2002 (modified).

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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 When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
-	-	Cable glands for electrical installations	EN 50262 + corr. October A1 A2	1998 1998 2001 2004
IEC 60050-581	- <sup>1)</sup>	International Electrotechnical Vocabulary (IEV) - Part 581: Electromechanical components for electronic equipment	-	-
IEC 60050-826	- <sup>1)</sup>	International Electrotechnical Vocabulary (IEV) - Part 826: Electrical installations	-	-
IEC 60060-1	- <sup>1)</sup>	High-voltage test techniques - Part 1: General definitions and test requirements	HD 588.1 S1	1991 <sup>2)</sup>
IEC 60068-1	- <sup>1)</sup>	Environmental testing - Part 1: General and guidance	EN 60068-1	1994 <sup>2)</sup>
IEC 60068-2-70	- <sup>1)</sup>	Environmental testing - Part 2: Tests - Test Xb: Abrasion of markings and letterings caused by rubbing of fingers and hands	EN 60068-2-70	1996 <sup>2)</sup>
IEC 60228	2004	Conductors of insulated cables	EN 60228 + corr. May	2005 2005
IEC 60309-1 A1 (mod)	1999 2005	Plugs, socket-outlets and couplers for industrial purposes - Part 1: General requirements	EN 60309-1 A1	1999 2007
IEC 60352-1	- <sup>1)</sup>	Solderless connections - Part 1: Wrapped connections - General requirements, test methods and practical guidance	EN 60352-1	1997 <sup>2)</sup>
IEC 60352-2	- <sup>1)</sup>	Solderless connections - Part 2: Crimped connections - General requirements, test methods and practical guidance	EN 60352-2	2006 <sup>2)</sup>
IEC 60352-3	1993	Solderless connections - Part 3: Solderless accessible insulation displacement connections - General requirements, test methods and practical guidance	EN 60352-3	1994

<sup>1)</sup> Undated reference.

<sup>2)</sup> Valid edition at date of issue.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60352-4	1994	Solderless connections - Part 4: Solderless non-accessible insulation displacement connections - General requirements, test methods and practical guidance	EN 60352-4	1994
IEC 60352-5	- <sup>1)</sup>	Solderless connections - Part 5: Press-in connections - General requirements, test methods and practical guidance	EN 60352-5	2008 <sup>2)</sup>
IEC 60352-6	- <sup>1)</sup>	Solderless connections - Part 6: Insulation piercing connections - General requirements, test methods and practical guidance	EN 60352-6	1997 <sup>2)</sup>
IEC 60352-7	- <sup>1)</sup>	Solderless connections - Part 7: Spring clamp connections - General requirements, test methods and practical guidance	EN 60352-7	2002 <sup>2)</sup>
IEC 60364-4-41 (mod)	- <sup>1)</sup>	Low-voltage electrical installations - Part 4-41: Protection for safety - Protection against electric shock	HD 60364-4-41 + corr. July	2007 <sup>2)</sup> 2007
IEC 60417	Data-base	Graphical symbols for use on equipment	-	-
IEC 60512	Series	Connectors for electronic equipment - Tests and measurements	EN 60512	Series
IEC 60512-1-100	- <sup>1)</sup>	Connectors for electronic equipment - Tests and measurements - Part 1-100: General - Applicable publications	EN 60512-1-100	2006 <sup>2)</sup>
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May	1991 1993
A1	1999		A1	2000
IEC 60664-1	2007	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	EN 60664-1	2007
IEC 60664-5	2007	Insulation coordination for equipment within low-voltage systems - Part 5: Comprehensive method for determining clearances and creepage distances equal to or less than 2 mm	EN 60664-5	2007
IEC 60760	- <sup>1)</sup>	Flat, quick-connect terminations	-	-
IEC 60998-2-3 (mod)	2002	Connecting devices for low-voltage circuits for household and similar purposes - Part 2-3: Particular requirements for connecting devices as separate entities with insulation-piercing clamping units	EN 60998-2-3	2004
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 <sup>2</sup> up to 35 mm <sup>2</sup> (included)	EN 60999-1	2000

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
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 <sup>2</sup> up to 300 mm <sup>2</sup> (included)	EN 60999-2	2003
IEC 61032	- <sup>1)</sup>	Protection of persons and equipment by enclosures - Probes for verification	EN 61032	1998 <sup>2)</sup>
IEC 61140	- <sup>1)</sup>	Protection against electric shock - Common aspects for installation and equipment	EN 61140	2002 <sup>2)</sup>
IEC 61210 (mod)	- <sup>1)</sup>	Connecting devices - Flat quick-connect terminations for electrical copper conductors - Safety requirements	EN 61210	1995 <sup>2)</sup>
ISO 6988	1985	Metallic and other non-organic coatings - Sulfur dioxide test with general condensation of moisture	EN ISO 6988	1994



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## CONNECTORS – SAFETY REQUIREMENTS AND TESTS

### 1 Scope

This International Standard applies to connectors with rated voltages above 50 V and up to 1000 V a.c. and d.c. and rated currents up to 125 A per contact, for which either no detail specification (DS) exists or the DS calls up this standard for safety aspects.

For connectors with rated voltage up to 50 V, this standard may be used as a guide. In this case, reference is made to IEC 60664-1 for clearance and creepage distances.

This standard may also be used as a guide for connectors with rated current higher than 125 A per pole.

This standard does not apply to connectors in or on equipment where application specific safety requirements for connectors exist.

### 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 60050-581, *International Electrotechnical Vocabulary (IEV) – Chapter 581: Electromechanical components for electronic equipment*

IEC 60050-826, *International Electrotechnical Vocabulary (IEV) – Chapter 826: Electrical installations*

IEC 60060-1, *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, *Environmental testing – Part 2: Tests – Test Xb: Abrasion of marking and letterings caused by rubbing of fingers and hands*

IEC 60228: 2004, *Conductors of insulated cables*

IEC 60309-1:1999, *Plugs, socket-outlets and couplers for industrial purposes – Part 1: General requirements*  
Amendment 1 (2005)

IEC 60352-1, *Solderless connections – Part 1: Wrapped connections – General requirements, test methods and practical guidance*

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

IEC 60352-3:1993, *Solderless connections – Part 3: Solderless accessible insulation displacement connections – General requirements, test methods and practical guidance*

IEC 60352-4:1994, *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 60364-4-41, *Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock*

IEC 60417, *Graphical symbols for use on equipment*

IEC 60512 (all parts), *Connectors for electronic equipment – Tests and measurements* <sup>1</sup>

IEC 60512-1-100, *Connectors for electronic equipment – Tests and measurements – Part 1-100: General – Applicable publications*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*  
Amendment 1 (1999)

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

IEC 60664-5:2007, *Insulation coordination for equipment within low-voltage systems – Part 5: Comprehensive method for determining clearances and creepage distances equal to or less than 2 mm*

IEC 60760, *Flat, quick-connect terminations*

IEC 60998-2-3:2002, *Connecting devices for low-voltage circuits for household and similar purposes – Part 2-3: Particular requirements for connecting devices as separate entities with insulation-piercing clamping units*

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<sup>2</sup> up to 35 mm<sup>2</sup> (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 conductors above 35 up to 300 mm<sup>2</sup> (included)*

IEC 61032, *Protection of persons and equipment by enclosures – Probes for verification*

IEC 61140, *Protection against electric shock – Common aspects for installation and equipment*

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<sup>1</sup> IEC 60512-1-100 gives the list of tests of the IEC 60512 series and the part of IEC 60512 corresponding to each test.

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

ISO 6988:1985, *Metallic and other non organic coatings – Sulfur dioxide test with general condensation of moisture*

EN 50262:1998, *Cable glands for electrical installations*  
Amendment 1 (2001)  
Amendment 2 (2004)

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