

**Madalpingelised lülitus- ja juhtimisaparaadid. Osa 5-3:
Juhtimisahelaseadmed ja lülituselemendid. Nõuded
rikkeoludes määratletud käitumisega lähedusseadistele**

**Low-voltage switchgear and controlgear - Part 5-3:
Control circuit devices and switching elements -
Requirements for proximity devices with defined
behaviour under fault conditions (PDDb)**

EESTI STANDARDI EESSÕNA

See Eesti standard EVS-EN 60947-5-3:2013 sisaldab Euroopa standardi EN 60947-5-3:2013 ingliskeelset teksti.

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NATIONAL FOREWORD

This Estonian standard EVS-EN 60947-5-3:2013 consists of the English text of the European standard EN 60947-5-3:2013.

This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.

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**Low-voltage switchgear and controlgear -
Part 5-3: Control circuit devices and switching elements -
Requirements for proximity devices with defined behaviour
under fault conditions (PDDB)
(IEC 60947-5-3:2013)**

Appareillage à basse tension -
Partie 5-3: Appareils et éléments de
commutation pour circuits de commande -
Exigences pour dispositifs de détection de
proximité à comportement défini dans des
conditions de défaut (PDDB)
(CEI 60947-5-3:2013)

Niederspannungsschaltgeräte -
Teil 5-3: Steuergeräte und Schaltelemente
-
Anforderungen für Näherungsschalter mit
definiertem Verhalten unter
Fehlerbedingungen (PDDB)
(IEC 60947-5-3:2013)

This European Standard was approved by CENELEC on 2013-09-10. 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.

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

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

Foreword

The text of document 17B/1821/FDIS, future edition 2 of IEC 60947-5-3, prepared by SC 17B "Low-voltage switchgear and controlgear" of IEC/TC 17 "Switchgear and controlgear" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60947-5-3:2013.

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) 2014-06-10
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2016-09-10

This document supersedes EN 60947-5-3:1999.

EN 60947-5-3:2013 includes the following significant technical changes with respect to EN 60947-5-3:1999:

- a) general principles of EN 61508 series;
- b) classification according to the requirements of EN 62061;
- c) classification according to EN ISO 13849-1.

This European Standard is to be read in conjunction with EN 60947-1, *Low-voltage switchgear and controlgear – Part 1: General rules* and EN 60947-5-2, *Low-voltage switchgear and controlgear – Part 5-2: Control circuit devices and switching elements - Proximity switches*. The provisions of Part 1 and Part 5-2 are only applicable to this European Standard where specifically called for. The numbering of the subclauses of this European Standard is sometimes not continuous because it is based on the numbering of the subclauses of EN 60947-1 or EN 60947-5-2.

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

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s), see informative Annex ZZ, which is an integral part of this document.

This European Standard does not deal with any specific requirements on noise as the noise emission of control circuit devices and switching elements is not considered to be a relevant hazard.

Endorsement notice

The text of the International Standard IEC 60947-5-3:2013 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 60068-2-6:2007	NOTE	Harmonized as EN 60068-2-6:2008 (not modified).
IEC 60068-2-14:2009	NOTE	Harmonized as EN 60068-2-14:2009 (not modified).
IEC 60068-2-27:2008	NOTE	Harmonized as EN 60068-2-27:2009 (not modified).
IEC 60204-1:2005 A1:2008	NOTE	Harmonized as EN 60204-1:2006 (modified) and EN 60204-1:2006/A1:2009 (not modified).
IEC 60364	NOTE	Harmonized in HD 384 / HD 60364 series (partially modified).
IEC 60445:2010	NOTE	Harmonized as EN 60445:2010 (not modified).
IEC 60947-5-6:1999	NOTE	Harmonized as EN 60947-5-6:2000 (not modified).
IEC 61000-3-2:2005 A1:2008 A2:2009	NOTE	Harmonized as EN 61000-3-2:2006 (not modified), EN 61000-3-2:2006/A1:2009 (not modified) and EN 61000-3-2:2006/A2:2009 (not modified).
IEC 61000-3-3:2008	NOTE	Harmonized as EN 61000-3-3:2008 (not modified).
IEC 61000-4-13:2002 A1:2009	NOTE	Harmonized as EN 61000-4-13:2002 (not modified) and EN 61000-4-13:2002/A1:2009 (not modified).
IEC 61140:2001 A1:2004	NOTE	Harmonized as EN 61140:2002 (not modified) and EN 61140:2002/A1:2006 (modified).
IEC 61165:2006	NOTE	Harmonized as EN 61165:2006 (not modified).
IEC 61326-3-1:2008	NOTE	Harmonized as EN 61326-3-1:2008 (not modified).
IEC 61496-1:2012	NOTE	Harmonized as EN 61496-1:201X ¹⁾ .
IEC 61496-2:2013	NOTE	Harmonized as EN 61496-2:201X ²⁾ (not modified).
IEC 61496-3:2008	NOTE	Harmonized as CLC/TS 61496-3:2008 (not modified).
IEC 61508-4:2010	NOTE	Harmonized as EN 61508-4:2010 (not modified).
IEC 61508-5:2010	NOTE	Harmonized as EN 61508-5:2010 (not modified).
IEC 61508-6:2010	NOTE	Harmonized as EN 61508-6:2010 (not modified).
IEC 61508-7:2010	NOTE	Harmonized as EN 61508-7:2010 (not modified).

1) At draft stage.

2) To be published.

IEC 61511	NOTE	Harmonized in EN 61511 series (not modified).
IEC 61511-1:2003	NOTE	Harmonized as EN 61511-1:2004 (not modified).
IEC 61511-2:2003	NOTE	Harmonized as EN 61511-2:2004 (not modified).
IEC 61511-3:2003	NOTE	Harmonized as EN 61511-3:2004 (not modified).
CISPR 11:2009 A1:2010	NOTE	Harmonized as EN 55011:2009 (modified) and EN 55011:2009/A1:2010 (not modified).

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 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>
IEC 60068-2-1	2007	Environmental testing - Part 2-1: Tests - Test A: Cold	EN 60068-2-1	2007
IEC 60068-2-30	2005	Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)	EN 60068-2-30	2005
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529	1991
-	-		+ corr. May	1993
+ A1	1999		+ A1	2000
IEC 60947-1	2007	Low-voltage switchgear and controlgear -	EN 60947-1	2007
+ A1	2010	Part 1: General rules	+ A1	2011
IEC 60947-5-1	2003	Low-voltage switchgear and controlgear -	EN 60947-5-1	2004
-	-	Part 5-1: Control circuit devices and	+ corr. July	2005
+ A1	2009	switching elements - Electromechanical control circuit devices	+ A1	2009
IEC 60947-5-2	2007	Low-voltage switchgear and controlgear -	EN 60947-5-2	2007
+ A1	2012	Part 5-2: Control circuit devices and switching elements - Proximity switches	+ A1	2012
IEC 61000-4-2	2008	Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test	EN 61000-4-2	2009
IEC 61000-4-3	2006	Electromagnetic compatibility (EMC) -	EN 61000-4-3	2006
+ A1	2007	Part 4-3: Testing and measurement	+ A1	2008
+ A2	2010	techniques - Radiated, radio-frequency, electromagnetic field immunity test	+ A2	2010
IEC 61000-4-4	2012	Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test	EN 61000-4-4	2012
IEC 61000-4-5	2005	Electromagnetic compatibility (EMC) -	EN 61000-4-5	2006
+ corr. October	2009	Part 4-5: Testing and measurement techniques - Surge immunity test		
IEC 61000-4-6	2008	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields	EN 61000-4-6	2009

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61000-4-8	2009	Electromagnetic compatibility (EMC) - Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test	EN 61000-4-8	2010
IEC 61000-4-11	2004	Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests	EN 61000-4-11	2004
IEC 61131-2	2007	Programmable controllers - Part 2: Equipment requirements and tests	EN 61131-2 ³⁾	2007
IEC 61508-1	2010	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 1: General requirements	EN 61508-1	2010
IEC 61508-2	2010	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 2: Requirements for electrical/electronic/programmable electronic safety-related systems	EN 61508-2	2010
IEC 61508-3	2010	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 3: Software requirements	EN 61508-3	2010
IEC 62061 + corr. July + corr. April + A1	2005 2005 2008 2012	Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems	EN 62061 + corr. February - + A1	2005 2010 - 2013
ISO 13849-1	2006	Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design	-	-

3) EN 61131-2 is superseded by EN 61010-2-201:2013, which is based on IEC 61010-2-201:2013.

Annex ZZ (informative)

Coverage of Essential Requirements of EC Directives

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association to provide one means of conforming to Essential Requirements of the New Approach Directive for machinery 2006/42/EC.

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with essential requirements as given in Annex I, 1.2.1 of that Directive and associated EFTA regulations.

WARNING: Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

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LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 5-3: Control circuit devices and switching elements – Requirements for proximity devices with defined behaviour under fault conditions (PDDB)

1 General

1.1 Scope

This part of IEC 60947 series provides additional requirements to those given in IEC 60947-5-2. It addresses the fault performance aspects of proximity devices with a defined behaviour under fault conditions (PDDB). It does not address any other characteristics that can be required for specific applications.

This standard does not cover proximity devices with analogue output.

This Standard does not deal with any specific requirements on acoustic noise as the noise emission of control circuit devices and switching elements is not considered to be a relevant hazard.

For a PDDB used in applications where additional characteristics, dealt with in other standards, are required, the requirements of all relevant standards apply.

The use of this standard alone does not demonstrate suitability for the implementation of any specific safety related functionality. In particular, this standard does not provide requirements for the actuation characteristics of a PDDB, or for means to reduce the effects of mutual interference between devices, e.g. coded targets. Therefore these and any other application-specific requirements will need to be considered in addition to the requirements of this standard.

NOTE 1 Due to their behaviour under fault conditions, PDDBs can, for example, be used as interlocking devices (see ISO 14119).

NOTE 2 The requirements for electro-sensitive protective equipment for the detection of persons are given in the IEC 61496 series.

1.2 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 60068-2-1:2007, *Environmental testing – Part 2-1: Tests – Test A: Cold*

IEC 60068-2-30:2005, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 + 12 h cycle)*

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

IEC 60947-1:2007, *Low-voltage switchgear and controlgear – Part 1: General rules*
Amendment 1:2010

IEC 60947-5-1:2003, *Low-voltage switchgear and controlgear – Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices*
Amendment 1:2009

IEC 60947-5-2:2007, *Low-voltage switchgear and controlgear – Part 5-2: Control circuit devices and switching elements – Proximity switches*
Amendment 1:2012

IEC 61000-4-2:2008, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*

IEC 61000-4-3:2006, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*
Amendment 1:2007
Amendment 2:2010

IEC 61000-4-4:2012, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test*

IEC 61000-4-5:2005, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*

IEC 61000-4-6:2008, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*

IEC 61000-4-8:2009, *Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test*

IEC 61000-4-11:2004, *Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests*

IEC 61131-2:2007, *Programmable controllers – Part 2: Equipment requirements and tests*

IEC 61508-1:2010, *Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 1: General requirements*

IEC 61508-2:2010, *Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 2: Requirements for electrical/electronic/programmable electronic safety-related systems*

IEC 61508-3:2010, *Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 3: Software requirements*

IEC 62061:2005, *Safety of machinery – Functional safety of safety-related electrical, electronic and programmable electronic control systems*
Amendment 1:2012

ISO 13849-1:2006, *Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design*