

MADALPINGELISED LÜLITUSAPARAADID. OSA 4-1:
KONTAKTORID JA MOOTORIKÄIVITID.
ELEKTROMEHAANILISED KONTAKTORID JA
MOOTORIKÄIVITID

Low-voltage switchgear and controlgear - Part 4-1:
Contactors and motor-starters - Electromechanical
contactors and motor-starters

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 60947-4-1:2019 sisaldab Euroopa standardi EN IEC 60947-4-1:2019 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 60947-4-1:2019 consists of the English text of the European standard EN IEC 60947-4-1:2019.
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English Version

**Low-voltage switchgear and controlgear - Part 4-1: Contactors
and motor-starters - Electromechanical contactors and motor-
starters
(IEC 60947-4-1:2018)**

Appareillage à basse tension - Partie 4-1: Contacteurs et
démarreurs de moteurs - Contacteurs et démarreurs
électromécaniques
(IEC 60947-4-1:2018)

Niederspannungsschaltgeräte - Teil 4-1: Schütze und
Motorstarter - Elektromechanische Schütze und
Motorstarter
(IEC 60947-4-1:2018)

This European Standard was approved by CENELEC on 2018-11-29. 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: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 121A/224/FDIS, future edition 4 of IEC 60947-4-1, prepared by SC 121A "Low-voltage switchgear and controlgear" of IEC/TC 121 "Switchgear and controlgear and their assemblies for low voltage" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60947-4-1:2019.

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) 2019-09-22
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-03-22

This document supersedes EN 60947-4-1:2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC 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 Directives 2014/30/EU and 2014/35/EU.

For the relationship with the EU Directive 2014/30/EU see informative Annex ZZA and for the relationship with the EU Directive 2014/35/EU see informative Annex ZZB, which are integral parts of this document.

Endorsement notice

The text of the International Standard IEC 60947-4-1:2018 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 60068-2-2:2007	NOTE	Harmonized as EN 60068-2-2:2007 (not modified)
IEC 60079 (series)	NOTE	Harmonized as EN 60079 (series)
IEC 60079-7	NOTE	Harmonized as EN 60079-7
IEC 60079-29-3	NOTE	Harmonized as EN 60079-29-3
IEC 60269-1:2006	NOTE	Harmonized as EN 60269-1:2007 (not modified)
IEC 60269-2:2013	NOTE	Harmonized as HD 60269-2:2013 (modified)
IEC 60664-1:2007	NOTE	Harmonized as EN 60664-1:2007 (not modified)
IEC 60812:2006	NOTE	Harmonized as EN 60812:2006 (not modified)
IEC 60947-3	NOTE	Harmonized as EN 60947-3
IEC 60947-8	NOTE	Harmonized as EN 60947-8
IEC 60990:2016	NOTE	Harmonized as EN 60990:2016 (not modified)
IEC 61000-6-5	NOTE	Harmonized as EN 61000-6-5
IEC 61032	NOTE	Harmonized as EN 61032
IEC 61095:2009	NOTE	Harmonized as EN 61095:2009 (not modified)
IEC 61508-2	NOTE	Harmonized as EN 61508-2

IEC 61508-3	NOTE	Harmonized as EN 61508-3
IEC 61508-4:2010	NOTE	Harmonized as EN 61508-4:2010 (not modified)
IEC 61508-6:2010	NOTE	Harmonized as EN 61508-6:2010 (not modified)
IEC 61649	NOTE	Harmonized as EN 61649
IEC 61915-2:2011	NOTE	Harmonized as EN 61915-2:2012 (not modified)
IEC 62061	NOTE	Harmonized as EN 62061
IEC 62443 (series)	NOTE	Harmonized as EN 62443 (series)
IEC 62477-1:2012	NOTE	Harmonized as EN 62477-1:2012 (not modified)
IEC 62683-1	NOTE	Harmonized as EN 62683-1
ISO/IEC 80079-34	NOTE	Harmonized as EN ISO/IEC 80079-34

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Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 Where 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 60034-1	2017	Rotating electrical machines - Part 1: Rating and performance	-	-
IEC 60034-12	2016	Rotating electrical machines - Part 12: Starting performance of single-speed three-phase cage induction motors	EN 60034-12	2017
IEC 60034-30-1	-	Rotating electrical machines - Part 30-1: Efficiency classes of line operated AC motors (IE code)	EN 60034-30-1	2014
IEC 60038 (mod)	-	IEC standard voltages	EN 60038	2011
IEC 60068-2-14	2009	Environmental testing - Part 2-14: Tests - Test N: Change of temperature	EN 60068-2-14	2009
IEC 60079-14	-	Explosive atmospheres - Part 14: Electrical installations design, selection and erection	EN 60079-14	2014
IEC 60085	2007	Electrical insulation - Thermal evaluation and designation	EN 60085	2008
IEC 60364-1 (mod)	2005	Low-voltage electrical installations - Part 1: Fundamental principles, assessment of general characteristics, definitions	HD 60364-1	2008
-	-		+ A11	2017
IEC 60364-7-712	-	Electrical installations of buildings -- Part 7-712: Requirements for special installations or locations - Solar photovoltaic (PV) power supply systems	HD 60364-7-712	2005
-	-		+ corrigendum	2006
IEC 60715	2017	Dimensions of low-voltage switchgear and controlgear - Standardized mounting on rails for mechanical support of switchgear, controlgear and accessories	EN 60715	2017
IEC 60730-1 (mod)	-	Automatic electrical controls - Part 1: General requirements	EN 60730-1	2016

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60947-1	2007	Low-voltage switchgear and controlgear - Part 1: General rules	EN 60947-1	2007
+ A1	2010		+ A1	2011
+ A2	2014		+ A2	2014
IEC 60947-2	2016	Low-voltage switchgear and controlgear - Part 2: Circuit-breakers	EN 60947-2	2017
+COR 1	2016			
IEC 60947-5-1	2016	Low-voltage switchgear and controlgear - Part 5-1: Control circuit devices and switching elements - Electromechanical control circuit devices	EN 60947-5-1	2017
+COR 1	2016		-	-
IEC 61000-6-2	-	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments	EN 61000-6-2	2019
IEC 61051-2	1991 ¹	Varistors for use in electronic equipment - Part 2: Sectional specification for surge suppression varistors	-	-
IEC 61140	2016	Protection against electric shock - Common aspects for installation and equipment	EN 61140	2016
IEC 61439	series	Low-voltage switchgear and controlgear assemblies	EN 61439	series
IEC 61810-1	-	Electromechanical elementary relays - Part 1: General and safety requirements	EN 61810-1	2015
CISPR 11 (mod)	2015	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement	EN 55011	2016
+ A1	2016		+ A1	2017
ISO 2859-1	1999	Sampling procedures for inspection by attributes -- Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection	-	-
ISO 3864-2	2016 ¹	Graphical symbols - Safety colours and safety signs – Part 2: Design principles for product safety labels	-	-

¹ Dated as no equivalent European Standard exists.

Annex ZZA (informative)

Relationship between this European standard and the essential requirements of Directive 2014/30/EU [2014 OJ L96] aimed to be covered and the standardisation request M/552

This European standard has been prepared under the European Commission standardisation request C(2016) 7641 final of 30.11.2016², ('M/552'), as regards harmonised standards in support of Directive 2014/30/EU relating to electromagnetic compatibility, to provide one voluntary means of conforming to essential requirements of Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility [2014 OJ L96].

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

**Table ZZA.1 – Correspondence between this European standard and the
Essential Requirements set out in Directive 2014/30/EU [2014 OJ L96]**

Essential requirements of Directive 2014/30/EU	Clause(s) / sub-clause(s) of this EN	Remarks / Notes
Annex I. 1(a) (electromagnetic disturbances)	2, 8.3.3, 9.4.1, 9.4.3	
Annex I. 1(b) (electromagnetic immunity)	2, 8.3.1, 8.3.2, 9.4.1, 9.4.2	

WARNING 1: Presumption of conformity stays valid only as long as a reference to this European standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2: Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

² COMMISSION IMPLEMENTING DECISION C(2016) 7641 final of 30.11.2016 on a standardisation request to the European Committee for Standardisation, to the European Committee for Electrotechnical Standardisation and to the European Telecommunications Standards Institute as regards harmonised standards in support of Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.

Annex ZZB (informative)

Relationship between this European standard and the safety objectives of Directive 2014/35/EU [2014 OJ L96] aimed to be covered

This European standard has been prepared under a Commission's standardization request relating to harmonized standards in the field of the Low Voltage Directive, M/511, to provide one voluntary means of conforming to safety objectives of Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits [2014 OJ L96].

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZZB.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding safety objectives of that Directive, and associated EFTA regulations.

**Table ZZB.1 – Correspondence between this European standard and Annex I of
Directive 2014/35/EU [2014 OJ L96]**

Safety objectives of Directive 2014/35/EU	Clause(s) / sub-clause(s) of this EN	Remarks/note
1 a)	2, 3, 5, 6, 8, Annex A, Annex B, Annex F, Annex K, Annex M, Annex P, Annex Q	
1 b)	2, 3, 5, 6, 7, 8, 9, Annex A, Annex F, Annex G, Annex L, Annex M, Annex N, Annex Q	
1 c)	1, 2, 3, 5, 6, 7, 8,9, Annex A, Annex B, Annex D, Annex F, Annex G, Annex H, Annex I, Annex K, Annex L, Annex M, Annex O, Annex P, Annex Q	
2 a)	2, 3, 5, 6, 8, 9, Annex N	
2 b)	2, 3, 5, 6, 8.1, 9, Annex L	
2 c)	1, 2, 3, 5, 6, 7, 8, Annex F, Annex K, Annex L	
2 d)	2, 3, 5, 6, 8, 9, Annex B, Annex F, Annex K, Annex L, Annex M, Annex N, Annex P	
3 a)	2, 3, 5, 6, 7, 8, 9, Annex L, Annex M	
3 b)	2, 3, 5, 6, 7, 8, 9, Annex B, Annex D, Annex G, Annex I, Annex K, Annex L, Annex M, Annex P, Annex Q	
3 c)	2, 3, 5, 6, 8, 9, Annex B, Annex D, Annex H, Annex L, Annex P, Annex Q	

WARNING 1: Presumption of conformity stays valid only as long as a reference to this European standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –**Part 4-1: Contactors and motor-starters –
Electromechanical contactors and motor-starters**

FOREWORD

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This fourth edition cancels and replaces the third edition published in 2009 and its Amendment 1:2012. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- Scope structure and exclusions
- Editorial correction of notes and hanging paragraphs
- Reference to IEC 62683-1
- Motor protective switching device (MPSD) with its requirements

- Safety aspects related to:
 - General aspects;
 - Limited energy circuits;
 - Electronic circuits;
 - Assessment procedure for electromechanical overload protection used in safety - applications (new Annex L)
- Introduction of provisions covering the impact of higher locked rotor current to achieve high efficiency class
- Mention of dedicated wiring accessories
- Pickup power measurement
- Alignment to IEC 60947-1:2007, IEC 60947-1:2007/AMD1:2010, and IEC 60947-1:2007/AMD2:2014
- Direct current requirements for covering photovoltaic application (new Annex M)
- Load monitoring indicators (new Annex O)
- Short-circuit breaking tests of MPSD (new Annex P)
- Co-ordination under short-circuit conditions between a MPSD and another short-circuit protective device associated in the same circuit (new Annex Q)

The text of this International Standard is based on the following documents:

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

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 60947 series can be found, under the general title *Low-voltage switchgear and controlgear*, on the IEC website.

This document shall be read in conjunction with IEC 60947-1:2007, IEC 60947-1:2007/AMD1:2010, IEC 60947-1:2007/AMD2:2014, *Low voltage switchgear and controlgear – Part 1: General rules*. The provisions of the general rules are applicable to this document, where specifically called for.

The provisions of the general rules dealt with IEC 60947-1 are applicable to this part of IEC 60947 series where specifically called for. Clauses and subclauses, tables, figures and annexes of the general rules thus applicable are identified by reference to IEC 60947-1:2007, IEC 60947-1:2007/AMD1:2010, and IEC 60947-1:2007/AMD2:2014. For example, 4.3.4.1 of IEC 60947-1:2007, Table 4 of IEC 60947-1:2007, or Annex A of IEC 60947-1:2007.

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- withdrawn,
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