SVENSK STANDARD SS-EN IEC 60947-3

Fastställd	Utgåva	Sida	Ansvarig kommitté
2021-03-17	4	1 (1+98)	SEK TK 121A

Kopplingsapparater för högst 1000 V – Del 3: Lastbrytare, frånskiljare, lastfrånskiljare (i enheter) med och utan säkringar

Low-voltage switchgear and controlgear – Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units

Som svensk standard gäller europastandarden EN IEC 60947-3:2021. Den svenska standarden innehåller den officiella engelska språkversionen av EN IEC 60947-3:2021.

Nationellt förord

Europastandarden EN IEC 60947-3:2021

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 60947-3, Fourth edition, 2020 - Low-voltage switchgear and controlgear - Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units**

utarbetad inom International Electrotechnical Commission, IEC.

Standarden ska användas tillsammans med SS-EN IEC 60947-1, utgåva 6, 2021.

Tidigare fastställd svensk standard SS-EN 60947-3, utgåva 3, 2009, SS-EN 60947-3/A1, utgåva 1, 2012 och SS-EN 60947-3/A2, utgåva 1, 2016, gäller ej fr o m 2024-02-19.

ICS 29.130.20; 29.120.40

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 60947-3

February 2021

ICS 29.120.40; 29.130.20

Supersedes EN 60947-3:2009 and all of its amendments and corrigenda (if any)

English Version

Low-voltage switchgear and controlgear - Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units (IEC 60947-3:2020)

Appareillage à basse tension - Partie 3: Interrupteurs, sectionneurs, interrupteurs-sectionneurs et combinés-fusibles
(IEC 60947-3:2020)

Niederspannungsschaltgeräte - Teil 3: Lastschalter, Trennschalter, Lasttrennschalter und Schalter-Sicherungs-Einheiten
(IEC 60947-3:2020)

This European Standard was approved by CENELEC on 2020-05-27. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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

Ref. No. EN IEC 60947-3:2021 E

European foreword

The text of document 121A/340/FDIS, future edition 4 of IEC 60947-3, 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 60947-3:2021.

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) 2021–08-19
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2024–02-19

This document supersedes EN 60947-3:2009 and all of its amendments and corrigenda (if any).

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 Directive(s).

For the relationship with EU Directive(s) see informative Annexes ZZA and ZZB, which is an integral part of this document.

Endorsement notice

The text of the International Standard IEC 60947-3:2020 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 60364-5-52	NOTE	Harmonized as HD 60364-5-52
IEC 60447:2004	NOTE	Harmonized as EN 60447:2004 (not modified)
IEC 60664-1:2007	NOTE	Harmonized as EN 60664-1:2007 (not modified)
IEC 60898-1:2015	NOTE	Harmonized as EN 60898-1:2019
IEC 60947-2:2016	NOTE	Harmonized as EN 60947-2:2017 (not modified)
IEC 60947-4-1:2018	NOTE	Harmonized as EN IEC 60947-4-1:2019 (not modified)

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.

Publication	Year	Title	EN/HD	Year
IEC 60050-441	-	Electrotechnical Vocabulary – Switchgear, controlgear and fuses	-	-
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	2014	Rotating electrical machines - Part 30–1: Efficiency classes of line operated AC motors (IE code)	EN 60034-30-1	2014
IEC 60068-2-14	2009	Environmental testing – Part 2–14: Tests – Test N: Change of temperature	EN 60068-2-14	2009
IEC 60228	2004	Conductors of insulated cables	EN 60228 +AC	2005 2005
IEC 60269	(all parts)	Low-voltage fuses	EN 60269	(series)
IEC 60417	-	Graphical symbols for use on equipment	-	-
IEC 60695-2-11	2014	Fire hazard testing - Part 2–11: Glowing/hot-wire based test methods - Glow-wire flammability test method for end products (GWEPT)	EN 60695-2-11	2014
IEC 60947-1	2020	Low-voltage switchgear and controlgear - Part 1: General rules	EN IEC 60947-1	2021
IEC 60947-5-1 + CORR 1	2016 2016	Low-voltage switchgear and controlgear - Part 5–1: Control circuit devices and switching elements - Electromechanical control circuit devices	EN 60947-5-1	2017
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 +A1 +A2	2006 2007 2010	, Electromagnetic compatibility (EMC) – Part 4–3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test	EN 61000-4-3 +A1 +A2	2006 2008 2010

Publication	Year	Title	EN/HD	Year
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	2014	Electromagnetic compatibility (EMC) – Part 4–5: Testing and measurement techniques – Surge immunity test	EN 61000-4-5	2014
+A1	2017		+A1	2017
IEC 61000-4-6	2013	Electromagnetic compatibility (EMC) – Part 4–6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields	EN 61000-4-6	2014
			+AC1	2015
IEC 61238-1-1	-	Compression and mechanical connectors for power cables - Part 1–1: Test methods and requirements for compression and mechanical connectors for power cables for rated voltages up to 1 kV (Um = 1,2 kV) tested on non-insulated conductors	EN IEC 61238-1-1	2019
IEC 61545	1996	Connecting devices - Devices for the connection of aluminium conductors in clamping units of any material and copper conductors in aluminium bodied clamping units	-	-
IEC 62208	2011	Empty enclosures for low-voltage switchgear and controlgear assemblies - General requirements	EN 62208	2011
IEC 62475	2010	High-current test techniques - Definitions and requirements for test currents and measuring systems	EN 62475	2010
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	-	-
+A1	2011			
CISPR 11	2015	Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement	EN 55011 (modified)	2016
+A1	2016		+A1	2017
CISPR 32	2015	Electromagnetic compatibility of multimedia equipment - Emission requirements	EN 55032	2015
			+AC	2016

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60947-3 has been prepared by subcommittee 121A: Low-voltage switchgear and controlgear, of IEC technical committee 121: Switchgear and controlgear and their assemblies for low voltage.

This fourth edition cancels and replaces the third edition published in 2008, Amendment 1:2012 and Amendment 2:2015. This edition constitutes a technical revision.

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

- addition of critical load current tests for DC switches (see 9.3.9);
- addition of requirements for a conditional short-circuit rating for disconnectors, switches, and switch-disconnectors protected by circuit-breakers (see 9.3.7.2);
- addition of new categories for high-efficiency motors switching (see Annex A);

- addition of new Annex E for connection to aluminium conductors;
- addition of new Annex F for power losses measurement.

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

FDIS	Report on voting
121A/340/FDIS	121A/354/RVD

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 in the IEC 60947 series, published under the general title *Low-voltage switchgear and controlgear*, can be found on the IEC website.

This part is to be used in conjunction with the sixth edition of IEC 60947-1:2020 The numbering of the subclauses is sometimes not continuous because it is based on IEC 60947-1:2020.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

The provisions of the general rules dealt with in IEC 60947-1 are applicable to this document, where specifically called for. Clauses and subclauses, tables, figures and annexes of the general rules thus applicable are identified by reference to the sixth edition of IEC 60947-1:2020, for example, 5.3.4.1 of IEC 60947-1:2020, Table 4 of IEC 60947-1:2020, or Annex A of IEC 60947-1:2020.

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units

1 Scope

This part of IEC 60947 applies to switches, disconnectors, switch-disconnectors and fuse-combination units and their dedicated accessories to be used in distribution circuits and motor circuits of which the rated voltage does not exceed 1 000 V AC or 1 500 V DC.

NOTE 1 Accessories are interconnecting units, extended terminals, internal coils, auxiliary contacts, motor operator, etc. offered as options with the basic unit.

This document does not apply to equipment coming within the scope of IEC 60947-2, IEC 60947-4-1 and IEC 60947-5-1.

Particular requirements for switches, disconnectors, switch-disconnectors and fuse-combination units for use in photovoltaic (PV) DC applications are given in Annex D.

Specific requirements for LV switchgear intended for the connections of aluminium conductors are given in Annex E.

Guidance on measurement of power loss is provided in Annex F.

This document does not include the additional requirements necessary for electrical apparatus for explosive gas atmospheres.

NOTE 2 Depending on its design, a switch (or disconnector) can be referred to as "a rotary switch (disconnector)", "cam-operated switch (disconnector)", "knife-switch (disconnector)", etc.

NOTE 3 In this document, the word "switch" also applies to the apparatus referred to in French as "commutateurs", intended to modify the connections between several circuits and *inter alia* to substitute a part of a circuit for another.

NOTE 4 In general, throughout this document, switches, disconnectors, switch-disconnectors and fuse-combination units will be referred to as "equipment".

The object of this document is to state:

a) the characteristics of the equipment;
b) the conditions that apply to the equipment with reference to:
    1) operation and behaviour in normal service;
    2) operation and behaviour in case of specified abnormal conditions, e.g. short-circuit;
    3) dielectric properties;
c) the tests for confirming that these conditions have been met and the methods that are adopted for these tests;
d) the information relevant to the marking of the equipment or made available by the manufacturer, e.g. in the catalogue.

Specific items requiring agreement between the user and the manufacturer are identified in Annex B.

2 Normative references

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.

IEC 60050-441, *International Electrotechnical Vocabulary – Part 441: Switchgear, controlgear and fuses* (available at http://www.electropedia.org)

IEC 60034-12:2016, *Rotating electrical machines – Part 12: Starting performance of single-speed three-phase cage induction motors*

IEC 60034-30-1:2014, *Rotating electrical machines – Part 30-1: Efficiency classes of line operated AC motors (IE code)*

IEC 60228:2004, *Conductors of insulated cable*

IEC 60269 (all parts), *Low-voltage fuses*

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

IEC 60695-2-11:2014, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end-products (GWEPT)*

IEC 60947-1:2020, *Low-voltage switchgear and controlgear – Part 1: General rules*

IEC 60947-5-1:2016, *Low-voltage switchgear and controlgear – Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices*

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*
IEC 61000-4-3:2006/AMD1:2007
IEC 61000-4-3:2006/AMD2:2010

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

IEC 61000-4-5:2014, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*
IEC 61000-4-5:2014/AMD1:2017

IEC 61000-4-6:2013, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*

IEC 61545:1996, *Connecting devices – Devices for the connection of aluminium conductors in clamping units of any material and copper conductors in aluminium bodied clamping units*

IEC 62208:2011, *Empty enclosures for low-voltage switchgear and controlgear assemblies – General requirements*

IEC 62475:2010, *High-current test techniques – Definitions and requirements for test currents and measuring systems*

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 2859-1:1999/AMD1:2011

CISPR 11:2015, *Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement*
CISPR 11:2015/AMD1:2016

CISPR 32:2015, *Electromagnetic compatibility of multimedia equipment – Emission requirements*