# MADALPINGELISED LÜLITUSAPARAADID. OSA 3: KOORMUSLÜLITID, LAHKLÜLITID, KOORMUS-LAHKLÜLITID, SULAVKAITSMEKOMBINATSIOONID

# Low-voltage switchgear and controlgear - Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units (IEC 60947-3:2020 + IEC 60947-3:2020/AMD1:2025)

EESTI STANDARDIMIS- JA AKREDITEERIMISKESKUS
ESTONIAN CENTRE FOR STANDARDISATION AND ACCREDITATION

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

| | |
|---|---|
| See Eesti standard EVS-EN IEC 60947-3:2021 +A1:2025 sisaldab Euroopa standardi EN IEC 60947-3:2021 ja selle muudatuste A1:2025 ning paranduse AC:2021 ingliskeelset teksti. | This Estonian standard EVS-EN IEC 60947-3:2021+A1:2025 consists of the English text of the European standard EN IEC 60947-3:2021 and its amendment A1:2025 and its corrigendum AC:2021. |
| Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.<br><br>Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 19.02.2021 muudatus A1 27.06.2025. | This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.<br><br>Date of Availability of the European standard is 19.02.2021, for A1 27.06.2025. |
| Parandusega AC lisatud või muudetud teksti algus ja lõpp on tekstis tähistatud sümbolitega ⟦AC⟩ ⟨AC⟧.<br><br>Muudatusega A1 lisatud või muudetud teksti algus ja lõpp on tekstis tähistatud sümbolitega ⟦A1⟩ ⟨A1⟧.<br><br>Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest. | The start and finish of text introduced or altered by corrigendum AC is indicated in the text by tags ⟦AC⟩ ⟨AC⟧.<br><br>The start and finish of text introduced or altered by amendment A1 is indicated in the text by tags ⟦A1⟩ ⟨A1⟧.<br><br>The standard is available from the Estonian Centre for Standardisation and Accreditation. |

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 29.120.40; 29.130.20

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN IEC 60947-3 + A1

February 2021, June 2025

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 + IEC 60947-3:2020/AMD1:2025)

Appareillage à basse tension - Partie 3: Interrupteurs, sectionneurs, interrupteurs-sectionneurs et combinés-fusibles
(IEC 60947-3:2020 + IEC 60947-3:2020/AMD1:2025)

Niederspannungsschaltgeräte - Teil 3: Lastschalter, Trennschalter, Lasttrennschalter und Schalter-Sicherungs-Einheiten
(IEC 60947-3:2020 + IEC 60947-3:2020/AMD1:2025)

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**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

# 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

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## 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) |

## A1 Amendment A1 European foreword

The text of document 121A/645/FDIS, future edition 4 of IEC 60947-3/AMD1, 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/A1:2025.

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### Endorsement notice

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# IEC 60947-3

Edition 4.1 2025-04
CONSOLIDATED VERSION

# INTERNATIONAL STANDARD



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

IEC 60947-3:2020-04+AMD1:2025-04 CSV(en)

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# IEC 60947-3

Edition 4.1 2025-04
CONSOLIDATED VERSION

# INTERNATIONAL STANDARD



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

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# LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

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

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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.

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Amendment 1 to IEC 60947-3 ED4 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 amendment includes the following significant technical changes with respect to the current edition:

– addition of remotely operated devices;
– addition of a new Annex G defining the requirements for DC disconnectors, switch-disconnectors and fuse combination units for use in Battery Power Supplies (BPS) that are used in battery energy storage systems (BESS);
– addition of test requirements for short circuit making of single-phase operated switches and switch-disconnectors;
– switches for photovoltaic applications with utilisation categories DC-PV1 and DC-PV2 can, subject to marking, be suitable for current flow in one or both directions;
– more clarity in Annex F on the measurement of power loss in devices incorporating electronics and different pole configurations in DC devices.

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

| Draft | Report on voting |
|---|---|
| 121A/645/FDIS | 121A/675/RVD |

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

The language used for the development of this Amendment is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications/.

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〈A1〉

# 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)*

〖A1〗 IEC 60068-2-14:2023, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature* 〈A1〉

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*

〈A1〉 IEC 62208:2023, *Empty enclosures for low-voltage switchgear and controlgear assemblies – General requirements* 〈A1〉

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*

## 3 Terms, definitions and index of terms

### 3.1 General

For the purposes of this document, the terms and definitions given in IEC 60050-441 and IEC 60947-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

### 3.2 Alphabetical index of terms