



SLOVENSKI STANDARD
oSIST prEN IEC 60947-10:2025
01-marec-2025

Niskonapetostne stikalne in krmilne naprave - 10. del: Polprevodniški odklopniki

Low-voltage switchgear and controlgear - Part 10: Semiconductor Circuit-Breakers

Appareillage à basse tension - Partie 10: Disjoncteurs à semi-conducteurs

Ta slovenski standard je istoveten z: prEN IEC 60947-10:2025

ICS:

<https://standards.sist.si/standards/iec/60947-10-2025> 29.130.20 Niskonapetostne stikalne in krmilne naprave Low voltage switchgear and controlgear <https://standards.sist.si/standards/iec/60947-10-2025>

oSIST prEN IEC 60947-10:2025

en



121A/635/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER:

IEC 60947-10 ED1

DATE OF CIRCULATION:

2025-01-03

CLOSING DATE FOR VOTING:

2025-03-28

SUPERSEDES DOCUMENTS:

121A/565/CD, 121A/575A/CC

IEC SC 121A : LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR	
SECRETARIAT: France	SECRETARY: Mr Michaël LAHEURTE
OF INTEREST TO THE FOLLOWING COMMITTEES: TC 9, TC 22, SC 22G, TC 23, SC 23E, TC 44, TC 64, TC 69	HORIZONTAL FUNCTION(S):
ASPECTS CONCERNED: Electromagnetic Compatibility, Safety	
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TITLE:

Low-voltage switchgear and controlgear – Part 10: Semiconductor Circuit-Breakers

PROPOSED STABILITY DATE: 2027

NOTE FROM TC/SC OFFICERS:

SC121A Officers support circulation of CDV for project IEC 60947-10 ED1.

Secretary Note: NC experts are kindly requested to refer their comments to line number.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR – Part 10: Semiconductor circuit-breakers

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IEC 60947-10 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.

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

FDIS	Report on voting
121A/XX/FDIS	121A/XX/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.

The language used for the development of this International Standard 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.

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,
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The National Committees are requested to note that for this document the stability date is 20XX....

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LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 10: Semiconductor circuit-breakers

1 Scope

This part of IEC 60947 series applies to semiconductor circuit-breakers, intended to be installed and operated by instructed or skilled persons, the main terminals of which are intended to be connected to circuits, the rated voltage of which does not exceed 1 000 V AC. or 1 500 V DC.

This document covers the following different types:

- Semiconductor Circuit-Breakers (SCCBs) have semiconductor switching elements and, for isolation function, mechanical switching elements connected in series.
- Semiconductor Hybrid Circuit-Breakers (SCHCBs) have semiconductor switching elements and mechanical switching elements in parallel and in addition, for isolation function, mechanical switching elements connected in series.

In this document where the term “Circuit-Breaker” only is used, it applies to both types.

It applies whatever the rated currents, the method of construction or the proposed applications of the circuit-breakers may be.

The object of this document is to state:

- a) the characteristics of circuit-breakers;
- b) the conditions with which circuit-breakers shall comply with reference to:
 - 1) operation and behaviour in normal service;
 - 2) operation and behaviour in case of overload and operation and behaviour in case of short-circuit, including co-ordination in service (selectivity and back-up protection);
 - 3) dielectric properties;
 - 4) requirements on electromagnetic compatibility, where applicable.
- c) tests intended for confirming that these conditions have been met and the methods to be adopted for these tests;
- d) information to be marked on or given with the circuit-breakers.

NOTE For cybersecurity requirements, see IEC TS 63208

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.

AEC-Q101: *Failure mechanism based stress test qualification for discrete semiconductors in automotive applications*

IEC 60068-2-6, *Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)*

IEC 60068-2-14, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

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

- 41 IEC 60269-1:2006, *Low-voltage fuses – Part 1: General requirements*
42 IEC 60269-1:2006/AMD1:2009
43 IEC 60269-1:2006/AMD2:2014
- 44 IEC 60664-1:2020, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*
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- 46 IEC 60747-9, *Semiconductor devices - Part 9: Discrete devices - Insulated-gate bipolar transistors (IGBTs)*
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- 48 IEC 60749-5, *Semiconductor devices - Mechanical and climatic test methods - Part 5: Steady-state temperature humidity bias life test*
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- 50 IEC 60749-23, *Semiconductor devices - Mechanical and climatic test methods - Part 23: High temperature*
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- 52 IEC 60749-25, *Semiconductor devices - Mechanical and climatic test methods - Part 25: Temperature cycling*
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- 54 IEC 60749-34, *Semiconductor devices - Mechanical and climatic test methods - Part 34: Power cycling*
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- 56 IEC 60947-1:2020, *Low-voltage switchgear and controlgear – Part 1: General rules*
- 57 IEC 60947-2:2024, *Low-voltage switchgear and controlgear – Part 2: Circuit-breakers*
- 58 IEC 61000-3-2, *Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)*
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- 60 IEC 61000-3-3, *Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection*
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- 63 IEC 61000-4-2:2008 *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*
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- 65 IEC 61000-4-3:2020, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*
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- 68 IEC 61000-4-4:2012, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test*
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