

AS 60947.3:2023



Low-voltage switchgear and controlgear

Part 3: Switches, disconnectors, switch-disconnectors and fuse combination units (IEC 60947-3:2020 (ED. 4.0) MOD)



AS 60947.3:2023

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- Bureau of Steel Manufacturers of Australia
- Electrical Regulatory Authorities Council, Australia
- Energy Networks Australia
- Engineers Australia
- National Electrical and Communications Association
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Preface

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee EL-006 Industrial Switchgear and Controlgear, to supersede AS 60947.3:2018.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this document as an Australian Standard rather than an Australian/New Zealand Standard.

AS 60947.3:2018 will also remain current for 24 months after the date of publication of this document and after this time it will be superseded by AS 60947.3:2023. Regulatory authorities that reference this document in regulation may apply these requirements at a different time. Users of this document should consult with these authorities to confirm their requirements.

The objective of this Standard is to incorporate new requirements for determination of suitability of rated uninterruptible duty current, to specify requirements for 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, and to state —

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

The major changes in this edition are as follows:

- (i) Update AS 60947.3:2018, which is an adoption of IEC 60947-3:2015, to adopt the most recent IEC 60947-3:2020.
- (ii) Clarify and update the derating criteria of material at different ambients and provide a table of limiting temperature related to ambient.
- (iii) Clarify and resolve the conflict between AS 60947.3:2018, Table 12 and AS/NZS 61439.1:2016, Table 6.
- (iv) Clarify the different limits for I_e , and I_{the} (40°C and 60°C).
- (v) Clarify and update the criteria to be reported in a test report.
- (vi) New uninterrupted duty test (Clause D.5.3.4.2).

A list of all parts in the AS 60947 series can be found in the [Standards Australia online catalogue](#).

This Standard is an adoption with national modifications, and has been reproduced from, IEC 60947-3:2020 *Low-voltage switchgear and controlgear - Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units*. The modifications are additional requirements and are set out in [Appendix ZZ](#), which has been added at the end of the source text.

The modifications made to IEC 60947.3:2021 (Ed.4.0) form the Australian modifications for purpose of the IECEE CB Scheme for recognition of testing to standards for safety of electrical equipment.

[Appendix ZZ](#) lists the modifications to IEC 60947-3:2020 for the application of this Standard in Australia.

As this document has been reproduced from an International Standard the following applies:

- (A) In the source text “this International Standard” should read “this document”.
- (B) A full point substitutes for a comma when referring to a decimal marker.

Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

The terms “normative” and “informative” are used in Standards to define the application of the appendices or annexes to which they apply. A “normative” appendix or annex is an integral part of a Standard, whereas an “informative” appendix or annex is only for information and guidance.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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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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.

The contents of the corrigendum of October 2021 have been included in this copy.

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.