AS/NZS 60947.1:2021

STANDARDS NEW ZEALAND
TE MANA TAUTĪKANGA O AOTEAROA

STANDARDS Australia

Australian/New Zealand Standard™

Low-voltage switchgear and controlgear

Part 1: General rules (IEC 60947-1:2020 (ED. 6.0) MOD)

AS/NZS 60947.1:2021

This Joint Australian/New Zealand Standard™ was prepared by Joint Technical Committee EL-006, Industrial Switchgear And Controlgear. It was approved on behalf of the Council of Standards Australia on 24 September 2021 and by the New Zealand Standards Approval Board on 6 October 2021.

This Standard was published on 22 October 2021.

The following are represented on Committee EL-006:

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Bureau of Steel Manufacturers of Australia
Engineers Australia
Joint Accreditation System of Australia & New Zealand
Master Electricians Australia
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This Standard was issued in draft form for comment as DR AS/NZS 60947.1:2021.

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ISBN 978 1 76113 547 7

Australian/New Zealand Standard™

Low-voltage switchgear and controlgear

Part 1: General rules (IEC 60947-1:2020 (ED. 6.0) MOD)

Originated as AS 3650—1988.
Revised and redesignated as AS/NZS IEC 60947.1:2015.
Revised and redesignated as AS/NZS 60947.1:2021.

Preface

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-006, Industrial Switchgear And Controlgear, to supersede AS/NZS IEC 60947.1:2015, *Low-voltage switchgear and controlgear, Part 1: General rules.*

The objective of this document is to specify requirements, when required by the relevant product standard, to low-voltage switchgear and controlgear hereinafter referred to as "equipment" or "device" and 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 states the general rules and common safety requirements for low-voltage switchgear and controlgear, including —

(a) definitions;

(b) characteristics;

(c) information supplied with the equipment;

(d) normal service, mounting and transport conditions, decommissioning and dismantling;

(e) constructional and performance requirements;

(f) verification of characteristics and performance;

(g) energy efficiency aspects (see Annex V); and

(h) environmental aspects.

This document does not apply to —

(i) low-voltage switchgear and controlgear assemblies, which are dealt with in AS/NZS IEC 61439 series, as applicable;

(ii) terminals for connection of aluminium conductors;

(iii) use within explosive atmospheres (refer to AS/NZS 60079 series);

(iv) software and firmware requirements for functional safety application (refer to AS 61508.3); and

(v) cyber security aspects (refer to IEC 62443 series).

This document is an adoption with national modifications, and has been reproduced from, IEC 60947-1:2020, *Low-voltage switchgear and controlgear — Part 1: General rules.*

The modifications are additional requirements and are set out in Appendix ZZ, which has been added at the end of the source text.

Appendix ZZ lists the variations to IEC 60947-1:2020 for the application of this document in Australia and New Zealand.

As this document has been reproduced from an International Standard, 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

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LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 1: General rules

FOREWORD

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International Standard IEC 60947-1 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 sixth edition cancels and replaces the fifth edition published in 2007, Amendment 1:2010 and Amendment 2:2014. This edition constitutes a technical revision.

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

– DC values testing improvement;
– update of EMC tests;
– Annex B deletion;
– update of requirements for environmental tests (Table Q.1);
– improvement of Annex R (new examples);

– deletion of digital input Type 2, and introduction of Type 3 in Annex S;
– example for materials declaration (Annex W);
– new Annex X (co-ordination between short-circuit protective devices associated in the same circuit) created.

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

FDIS	Report on voting
121A/337/FDIS	121A/344/RVD

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

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

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

The following differing practices of a less permanent nature exist in the countries indicated below.

5.3.6.4 Rated conditional short-circuit current (I_q, alternatively I_{cc}) (North America)

6.2 Marking (USA and Canada)

8.1.3 Current-carrying parts and their connections (USA)

8.1.7.1 Additional constructional requirements (USA)

8.1.10.1 (North America)

9.2.6.2.2 Dependent power operation (USA)

9.2.6.2.3 Independent power operation (Canada and USA)

Figure 4 (USA and Canada)

Figure 5 (USA and Canada)

Figure 10 (USA and Canada)

Figure 11 (USA and Canada)

Figure X.4 (USA and Canada)

Figure X.5 (USA and Canada)

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

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

IMPORTANT – The "colour inside" logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this publication using a colour printer.

INTRODUCTION

The purpose of this document is to harmonize as far as practicable all rules and requirements of a general nature applicable to low-voltage switchgear and controlgear in order to obtain uniformity of requirements and tests throughout the corresponding range of equipment and to avoid the need for testing to different standards.

All those parts of the various equipment standards which can be considered as general have therefore been gathered in this document together with specific subjects of wide interest and application, e.g. temperature-rise, dielectric properties, etc.

For each type of low-voltage switchgear and controlgear, only two main documents are necessary to determine all requirements and tests:

1) this document, referred to as "Part 1" or “IEC 60947-1” in the specific standards covering the various types of low-voltage switchgear and controlgear;
2) the relevant equipment standard hereinafter referred to as the "relevant product standard" or "product standard of this series".

For a general rule to apply to a specific product standard, it will be explicitly referred to by the latter, by quoting the relevant clause or subclause number of this document followed by "IEC 60947-1" e.g. "7.2.3 of IEC 60947-1:20xx".

A specific product standard will only deviate from the general rules when there is substantial technical justification.

NOTE All references to “product standards” in this document means “product standards of IEC 60947 series”.

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 1: General rules

1 Scope

This document applies, when required by the relevant product standard, to low-voltage switchgear and controlgear hereinafter referred to as "equipment" or “device” and 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 states the general rules and common safety requirements for low-voltage switchgear and controlgear, including:

– definitions;
– characteristics;
– information supplied with the equipment;
– normal service, mounting and transport conditions, decommissioning and dismantling;
– constructional and performance requirements;
– verification of characteristics and performance;
– energy efficiency aspects (see Annex V);
– environmental aspects.

This document does not apply to:

– low-voltage switchgear and controlgear assemblies which are dealt with in IEC 61439 series, as applicable;
– terminals for connection of aluminium conductors;

NOTE Terminals for aluminium conductors are under consideration for the next revision.

– use within explosive atmospheres (see IEC 60079 series);
– software and firmware requirements for functional safety application (see IEC 61508-3);
– cyber security aspects (see IEC 62443 series).

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 60038:2009, *IEC standard voltages*

IEC 60068-1:2013, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-1:2007, *Environmental testing – Part 2-1: Tests – Test A: Cold*

IEC 60068-2-2:2007, *Environmental testing – Part 2-2: Tests – Test B: Dry heat*

IEC 60068-2-6:2007, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*