AS/NZS 61009.1:2015

Australian/New Zealand Standard

Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs)

Part 1: General rules

Superseding AS/NZS 61009.1:2011
This joint Australian/New Zealand standard was prepared by joint Technical Committee EL-004, Electrical Accessories. It was approved on behalf of the Council of Standards Australia on 12 February 2015 and on behalf of the Council of Standards New Zealand on 10 February 2015.

This standard was published on 23 March 2015.

The following are represented on Committee EL-004:
- Australian Chamber of Commerce and Industry
- Australian Industry Group
- Consumer Electronics Suppliers Association
- Consumers Federation of Australia
- Electrical Compliance Testing Association
- Electrical Regulatory Authorities Council
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This standard was issued in draft form for comment as DR AS/NZS 61009.1:2014.
Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs)

Part 1: General rules

Originated in Australia as part of AS C111—1938.
Originated in New Zealand as AS/NZS 61009.1:1999.
Previous edition 2011.
PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-004, Electrical Accessories, to supersede AS/NZS 61009.1:2011, Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs), Part 1: General rules (IEC 61009-1, Ed.3.0 (2010) MOD).

The objective of this Standard is to provide Australian and New Zealand electrical industries with requirements for residual current operated circuit-breakers with integral overcurrent protection functionally independent of, or functionally dependent on, line voltage for household and similar uses.

This Standard is an adoption with national modifications. It has been reproduced from IEC 61009-1, Ed. 3.2 (2013), Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs), Part 1: General rules, which incorporates Amendment 1 (2012) and Amendment 2 (2013) and has been varied as indicated to take account of Australian/New Zealand conditions. The variations are specified in Appendix ZZ.

The variations described in Appendix ZZ form the Australian and New Zealand variations for the purposes of the CB scheme for recognition of testing to standards for safety of electrical equipment (the CB Scheme).

This Standard will exist in parallel with AS/NZS 3190, Approval and test specification—Residual current devices (current-operated earth-leakage devices), and AS/NZS 3111, Approval and test specification—Miniature overcurrent circuit-breakers, and any revisions thereof. Both this Standard and AS/NZS 3190, in conjunction with AS/NZS 3111, are acceptable for RCBOs. PRCDs are acceptable only if they comply with AS/NZS 3190.

The essential safety requirements in AS/NZS 3820, Essential safety requirements for electrical equipment, that could be applicable to RCBOs are covered by this Standard.

This Standard is structured as follows:

(a) Preface.

(b) IEC 61009-1, Ed. 3.2 (2013) (unedited from the contents page to the final clause of the source document).

(c) Appendix ZZ—(Australian/New Zealand) variations to the source document.

The variations listed in Appendix ZZ address issues including the following:

(i) Verification of the correct operation in case of sudden appearance of residual currents at specified currents between 5 \( I_{\Delta n} \) and 500 A.

(ii) Routine tests for overcurrent operation.

(iii) Type 1 RCBO additional requirements.

(iv) Add verification of the test device current.

As this Standard is reproduced from an International Standard, the following applies:

(A) In the source text ‘this International Standard’ should read ‘this Australian/New Zealand Standard’.

(B) A full point substitutes for a comma when referring to a decimal marker.
References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

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Only normative references that have been adopted as Australian or Australian/New Zealand Standards have been listed.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the annex to which they apply. A ‘normative’ annex is an integral part of a Standard, whereas an ‘informative’ annex is only for information and guidance.
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This part includes definitions, requirements and tests covering all types of RCBOs. For applicability to a specific type, this part applies in conjunction with the relevant part, as follows:

Part 2-1: Applicability of the general rules to RCBOs functionally independent of line voltage.

Part 2-2: Applicability of the general rules to RCBOs functionally dependent on line voltage.
Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs)

Part 1: General rules (IEC 61009-1, Ed. 3.2 (2013) MOD)

1 Scope

This International Standard applies to residual current operated circuit-breakers with integral overcurrent protection functionally independent of, or functionally dependent on, line voltage for household and similar uses (hereafter referred to as RCBOs), for rated voltages not exceeding 440 V a.c. with rated frequencies of 50 Hz, 60 Hz or 50/60 Hz and rated currents not exceeding 125 A and rated short-circuit capacities not exceeding 25 000 A for operation at 50 Hz or 60 Hz.

These devices are intended to protect people against indirect contact, the exposed conductive parts of the installation being connected to an appropriate earth electrode and to protect against overcurrents the wiring installations of buildings and similar applications. They may be used to provide protection against fire hazards due to a persistent earth fault current, without the operation of the overcurrent protective device.

RCBOs having a rated residual operating current not exceeding 30 mA are also used as a means for additional protection in the case of failure of the protective means against electric shock.

This standard applies to devices performing simultaneously the function of detection of the residual current, of comparison of the value of this current with the residual operating value and of opening of the protected circuit when the residual current exceeds this value, and also of performing the function of making, carrying and breaking overcurrents under specified conditions.

NOTE 1 The content of the present standard related to operation under residual current conditions is based on IEC 61008-1. The content of the present standard related to protection against overcurrents is based on IEC 60898-1.

NOTE 2 RCBOs are essentially intended to be operated by uninstructed persons and designed not to require maintenance. They may be submitted for certification purposes.

NOTE 3 Installation and application rules of RCBOs are given in the IEC 60364 series.

They are intended for use in an environment with pollution degree 2.

NOTE 4 For more severe overvoltage conditions, circuit-breakers complying with other standards (e.g. IEC 60947-2) should be used.

NOTE 5 For environments with higher pollution degrees, enclosures giving the appropriate degree of protection should be used.

RCBOs of the general type are resistant to unwanted tripping, including the case where surge voltages (as a result of switching transients or induced by lightning) cause loading currents in the installation without occurrence of flashover.

RCBOs of type S are considered to be sufficiently proof against unwanted tripping even if the surge voltage causes a flashover and a follow-on current occurs.

NOTE 6 Surge arresters installed downstream of the general type of RCBOs and connected in common mode may cause unwanted tripping.
RCBOs are suitable for isolation.

RCBOs complying with this standard, with the exception of those with an uninterrupted neutral, are suitable for use in IT systems.

Special precautions (e.g. lightning arresters) may be necessary when excessive overvoltages are likely to occur on the supply side (for example in the case of supply through overhead lines) (see IEC 60364-4-44).

NOTE 7 For RCBOs having a degree of protection higher than IP20 special constructions may be required.

This standard also applies to RCBOs obtained by the assembly of an adaptable residual current device with a circuit-breaker. The mechanical assembly shall be effected in the factory by the manufacturer, or on site, in which case the requirements of Annex G shall apply. It also applies to RCBOs having more than one rated current, provided that the means for changing from one discrete rating to another is not accessible in normal service and that the rating cannot be changed without the use of a tool.

Supplementary requirements may be necessary for RCBOs of the plug-in type.

Particular requirements are necessary for RCBOs incorporated in or intended only for association with plugs and socket-outlets or with appliance couplers for household and similar general purposes and if intended to be used at frequencies other than 50 Hz or 60 Hz.

For RCBOs incorporated in, or intended only for association with socket-outlets, the requirements of this standard may be used, as far as applicable, in conjunction with the requirements of IEC 60884-1 or the national requirements of the country where the product is placed on the market.

NOTE 8 Residual current-operated protective devices (RCDs) incorporated in, or intended only for association with socket-outlets, can either meet IEC 62640 or this standard.

NOTE 9 In DK, plugs and socket-outlets shall be in accordance with the requirements of the heavy current regulations section 107.

NOTE 10 In the UK, the plug part associated with an RCBO shall comply with BS 1363-1 and the socket-outlet(s) associated with an RCBO shall comply with BS 1363-2. In the UK, the plug part and the socket-outlet(s) associated with an RCBO need not comply with any IEC 60884-1 requirements.

This standard does not apply to:

- RCBOs intended to protect motors;
- RCBOs the current setting of which is adjustable by means accessible to the user in normal service.

The requirements of this standard apply for normal environmental conditions (see 7.1). Additional requirements may be necessary for RCBOs used in locations having severe environmental conditions.

RCBOs including batteries are not covered by this standard.

A guide for the coordination of RCBOs with fuses is given in Annex F.

2 Normative references

The following referenced documents are indispensable for the application 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.
AS/NZS 61009.1:2015 Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs) - Part 1: General rules

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