

Australian/New Zealand Standard™

**Approval and test specification—
Residual current devices (current-
operated earth-leakage devices)**



AS/NZS 3190:2016

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 16 March 2016 and by the Standards New Zealand Approval Board on 20 April 2016.
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This Standard was issued in draft form for comment as DR2 AS/NZS 3190:2015.

Australian/New Zealand Standard™

Approval and test specification— Residual current devices (current- operated earth-leakage devices)

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-004, Electrical Accessories, to supersede AS/NZS 3190:2011, *Approval and test specification—Residual current devices (current-operated earth-leakage devices)*.

This Standard incorporates Amendment No. 1 (July 2020). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

This Standard will exist in parallel to the deemed to comply Standards listed in Clause 3.2.

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AS/NZS 3190:2016 will remain current for 12 months from the date of publication of this document. After this time, it will be superseded by AS/NZS 3190:2016 incorporating Amendment No. 1. Regulatory authorities that reference this Standard in regulation may apply these requirements at a different time. User of this Standard should consult with these authorities to confirm their requirements.

The essential safety requirements in AS/NZS 3820, *Essential safety requirements for electrical equipment*, that could be applicable to residual current devices (current-operated earth-leakage devices) are covered by this Standard taken in conjunction with any other relevant requirements affecting safety.

The objective of this Standard is to provide Australian and New Zealand electrical industries (including manufacturers, test laboratories, installers and regulators) with electrical safety requirements and test methods for residual current devices (current-operated earth-leakage devices).

This Standard is one of a series of Approval and Test Specifications to be read in conjunction with AS/NZS 3100, *Approval and test specification—General requirements for electrical equipment*. The purpose of this series is to outline conditions that need to be met to secure approval for the sale and use of electrical equipment in Australia and New Zealand. Only safety matters and related conditions are covered.

There is a general acceptance that Type III and Type IV residual current devices do not provide adequate personal protection, however, they are within the scope of this Standard.

This Standard was revised to introduce the following changes:

- (a) SRCD, EPOD, MCB, RCBO and RCCB definitions added.
- (b) Clause 8.1.1 text relating to Table 4 revised.
- (c) Table 4 reformatted, sample selection modified and footnotes incorporated into Clause 8.1.1.
- (d) Reinstate Clause 8.16.1 prospective current test values.
- (e) Delete Appendix C (AS/NZS 3012 PSOA reference) and reference in Clause 7.3.2.2.
- (f) Insulation resistance test parameters in Clause 8.2 clarified.
- (g) General editorial revision and correction of some minor errors.

Exceptions: These occur in the main body of the text as italic print and are exceptions or variations to mandatory requirements. These give specific examples where the essential requirements do not apply or where they are varied for certain applications.

The term ‘normative’ has been used in this Standard to define the application of the appendices to which it applies. A ‘normative’ appendix is an integral part of a Standard.

This Standard does not purport to include all the necessary provisions of a contract.

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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard**Approval and test specification—Residual current devices (current-operated earth-leakage devices)****1 SCOPE AND REFERENCED DOCUMENTS****1.1 Scope**

This Standard specifies essential safety requirements for residual current devices and residual current relays intended to isolate supply or initiate a ‘tripping’ signal to isolate supply to protected circuits, socket-outlets or equipment in the event of a current flow to earth, which exceeds a predetermined level, and—

- (a) have rated residual currents not exceeding 300 mA;
- (b) have rated load currents not exceeding 125 A a.c.;
- (c) are designed for use at low voltage; and
- (d) are classified in accordance with Clause 4.

The devices may be either fixed or portable; integral with a switching device; miniature overcurrent circuit breaker; or supplied as a separate attachment.

This Standard does not apply to—

- (i) devices intended to be used with a particular circuit breaker other than a miniature overcurrent circuit-breaker, as defined in AS/NZS 3111 or AS/NZS 60898.1;
- (ii) devices intended to protect an electricity authority distribution system; or
- (iii) devices for the protection of equipment for mines and covered by the AS/NZS 2081 series of Standards.

1.2 Referenced documents

The following documents are referred to in this Standard:

AS

- | | |
|------------|---|
| 1931 | High-voltage test techniques |
| 1931.1 | Part 1: General definitions and test requirements |
| 60068 | Environmental testing |
| 60068.2.30 | Part 2.30: Tests—Test Db and guidance: Damp heat, cyclic (12 + 12-hour cycle) |

- | | |
|-------|--|
| 60529 | Degrees of protection provided by enclosures (IP Code) |
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AS/NZS

- | | |
|------|--|
| 2081 | Electrical protection devices for mines and quarries |
| 3003 | Electrical installations—Patient areas |
| 3012 | Electrical installations—Construction and demolition sites |

- | | | |
|----|-----------|---|
| A1 | 3100:2017 | Approval and test specification—General requirements for electrical equipment |
| | 3105 | Approval and test specification—Electrical portable outlet devices |
| | 3111 | Approval and test specification—Miniature overcurrent circuit-breakers |
| | 3112 | Approval and test specification—Plugs and socket-outlets |

AS/NZS

- 3117 Approval and test specification—Bayonet lampholders
- 3120 Approval and test specification—Cord extension sockets
- 3123 Approval and test specification—Plugs, socket-outlets and couplers for general industrial application
- 3140 Approval and test specification—Edison screw lampholders

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‘Text deleted’

- 3191 Electric flexible cords
- 3197 Approval and test specification—Portable electrical control or conditioning devices
- 60227 Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V
- 60227.5 Part 5: Flexible cables (cords)
- 60245 Rubber insulated cables—Rated voltage up to and including 450/750 V
- 60245.4 Part 4: Cords and flexible cables
- 60335 Household and similar electrical appliances—Safety
- 60335.1 Part 1: General requirements (IEC 60335-1, Ed. 5, MOD)
- 60898 Electrical accessories—Circuit-breakers for overcurrent protection for household and similar installations
- 60898.1 Part 1: Circuit-breakers for a.c. operation (IEC 60898-1, Ed. 1.2 (2003), MOD)
- 61008 Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs)
- 61008.1 Part 1: General rules (IEC 61008-1, Ed. 3.2 (2013), MOD)
- 61009 Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs)
- 61009.1 Part 1: General rules (IEC 61009-1, Ed. 3.2 (2013), MOD)
- 61347 Lamp controlgear
- 61347.2.8 Part 2.8: Particular requirements for ballasts for fluorescent lamps (IEC 61347-2-8:2000, MOD)

AS/NZS IEC

- 60947 Low-voltage switchgear and controlgear
- 60947.3 Part 3: Switches, disconnectors, switch-connectors and fuse-combination units

IEC

- 60309 Plugs, socket-outlets and couplers for industrial purposes (series)
- 61540 Electrical accessories—Portable residual current devices without integral overcurrent protection for household and similar use (PRCDs)
- 61543 Residual current-operated protective devices (RCDs) for household and similar use—Electromagnetic compatibility
- 62335 Circuit breakers—Switched protective earth portable residual current devices for *Class I* and battery powered vehicle applications
- 62423 Type F and Type B residual current operated circuit-breakers with and without integral overcurrent protection for household and similar uses

IEC	
62640	Residual current devices with or without overcurrent protection for socket-outlets for household and similar uses
IEC TR	
62350	Guidance for the correct use of residual current-operated protective devices (RCDs) for household and similar use

2 DEFINITIONS

For the purpose of this Standard the following definitions apply:

2.1 Break time

The tripping time of the interval between the instant at which the current starts to flow in the circuit and the instant at which the contacts or the means of isolation (isolating device) start to separate; or, in the case of a relay, the instant at which a tripping signal appears at its output terminals.

2.2 Electrical portable outlet device (EPOD)

A device, other than a cord extension set or a socket-outlet adaptor without any control or conditioning functions, having a single means of connection to a low voltage supply, and one or more outlet facilities. It may incorporate a reeling or coiling arrangement and/or a control or conditioning function.

NOTE: See AS/NZS 3105.

2.3 Miniature overcurrent circuit-breaker (MCB)

Mechanical switching device capable of making, carrying and breaking currents under normal circuit conditions and also of making, carrying for a specified time, and automatically breaking currents under specified abnormal circuit conditions, such as those occurring during a short-circuit.

For the purpose of this Standard, a miniature overcurrent circuit-breaker is a circuit-breaker with a panel projected area not more than 400 mm² pole.

NOTE: See AS/NZS 3111 and AS/NZS 60898.1.

2.4 Minimum non-actuating time

The maximum delay during which a value of residual current higher than the residual non-operating current can be applied to a device without causing it to operate.

2.5 Portable residual current device (PRCD)

A portable self-contained unit arranged for connection to a socket-outlet either directly or by means of a flexible cord and plug, and consisting of a Type I or Type II residual current device (see Clause 4.1) and one or more outlets, constructed so that it can be carried by hand.

For the purpose of this Standard, a portable residual current device is referred to as a PRCD.

2.6 Portable socket outlet assembly (PSOA)

A PSOA is a PRCD assembly with two or more socket-outlets that is primarily intended for construction and demolition sites as defined in AS/NZS 3012. See Clause 4.2 (c) and Clause 5.10 (b).

A1 | NOTE: Socket-outlets and plugs complying with AS/NZS 3112, AS/NZS 3123 or with the IEC 60309 series are acceptable.

2.7 Rated conditional short-circuit current

The value, assigned by the manufacturer, of the a.c. component of a prospective current, that a residual current device, protected by a suitable short-circuit protective device (SCPD) in series, can withstand under specified conditions of use and behaviour. [Symbol: I_{nc}]

2.8 Rated frequency

The frequency, assigned by the manufacturer, indicating the nominal frequency of a circuit that the residual current device is designed to protect.

2.9 Rated load current

The maximum continuous load current assigned by the manufacturer.

2.10 Rated residual current

The value of nominal residual (leakage) current, specified by the manufacturer, at which the positive operation of the residual current device or relay is ensured when subjected to all applicable conditions of Clause 8.8. [Symbol: $I_{\Delta n}$]

2.11 Rated voltage

The voltage, assigned by the manufacturer, indicating the nominal voltage of the circuit that the residual current device is designed to protect.

2.12 Reeling or coiling arrangement

An arrangement, which may be in the form of a frame or reel, intended for the storage of whole or part of a flexible cord and which is not detachable from the cord or PRCD without the use of a tool.

2.13 Residual current

The vector sum of the current flowing through the residual current device or relay. [Symbol: I_{Δ}]

2.14 Residual current device (RCD)

A mechanical switching device designed to make, carry and break currents under normal service conditions and to cause the opening of the contacts when I_{Δ} attains a given value under specified conditions.

2.15 Residual current operated circuit-breaker with integral overcurrent protection (RCBO)

Residual current operated circuit-breaker designed to perform the functions of protection against overloads and/or short-circuits.

2.16 Residual current operated circuit-breaker without integral overcurrent protection (RCCB)

Residual current operated circuit-breaker not designed to perform the functions of protection against overloads and/or short-circuits.

2.17 Residual current relay (also residual current unit)

A component incorporating a magnetic core, through which all active and neutral conductors of a circuit pass, capable of sensing a residual current from this circuit, and designed to produce a sudden change in its output circuit when I_{Δ} exceeds a predetermined level.

For the purpose of this Standard, residual current relays or residual current units are referred to as 'relays'.

2.18 Short Circuit Protective Device (SCPD)

A device providing short circuit protection.

2.19 Socket Residual Current Device (SRCD)

An SRCD is either a fixed socket outlet—

- (a) with an integral RCD; or
- (b) with a separate RCD intended to be associated with the socket outlet and mounted adjacent to the socket outlet. The RCD may be with or without overcurrent protection.

An SRCD may have feed through facility to enable RCD protection of downstream socket outlets.

Refer to IEC 62640 or the requirements of this Standard (AS/NZS 3190) and AS/NZS 3112.

2.20 Switched neutral pole

A pole intended only to switch the neutral conductor and not intended to have a short-circuit capacity.

2.21 Terminal devices

Terminal devices are terminal screws or clamping devices of opposite polarity intended for field wiring and terminals intended for field wiring.

2.22 Test facility

A means of enabling the operation of the residual current device to be checked in accordance with Clause 6.1.2.

2.23 Unprotected pole

A pole without overcurrent release, but otherwise generally capable of the same performance as a protected pole of the same circuit breaker.

3 COMPLIANCE WITH STANDARDS

3.1 General requirements of AS/NZS 3100

This Standard shall be read in conjunction with AS/NZS 3100, and the appropriate provisions of that Standard shall apply to the construction of the RCD or relay and the insulation and safeguarding of parts that normally carry current.

A1 | 3.2 Requirements for conformance to this Standard

3.2.1 *Specific requirements of this Standard*

An RCD or relay shall be deemed to comply with this Standard only if it complies with all the appropriate requirements of this Standard and passes the relevant tests specified herein.

A1 | Unless a specific requirement is stated for a PRCD, any requirement for an RCD shall apply to a PRCD.

3.2.2 *Requirements for other Standards*

3.2.2.1 *Other AS/NZS Standards*

RCDs complying with the following Standards are deemed to comply with the requirements of this Standard (AS/NZS 3190) without further test:

- (a) AS/NZS 61008.1.
- (b) AS/NZS 61009.1.

This Clause does not apply to the requirements for portable devices including PSOAs and PRCDs.

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3.2.2.2 IEC Standards where additional testing is required

Requirements for IEC Standards requiring additional testing to this Standard (AS/NZS 3190) are as follows:

NOTE: Tests required are those which are additional to or differ from the IEC tests.

- (a) IEC 61540.
- (b) IEC 62640.

3.2.2.3 IEC Standards where additional testing is not required

Requirements for IEC Standards that are not required to have additional testing to this Standard (AS/NZS 3190) are as follows:

- (a) IEC 62423.

NOTE: Includes requirements to IEC 61008-1 and IEC 61009-1, which are replaced by AS/NZS 61008.1 and AS/NZS 61009.

- (b) IEC 62335.

NOTES:

- 1 Includes requirements to IEC 61008-1, which is replaced by AS/NZS 61008.1.
- 2 In addition to the RCD function, the SPE-PRCDs address incorrect supply connections resulting in a hazardous live PE and/or supply failure (e.g. loss of supply PE or loss of supply N). These SPE-PRCDs are intended for application only on TN and TT systems.
- 3 Type SPE-PRCD was Type FSE (faulty supply switched earth) in previous AS/NZS 3190 editions. Type FSE is no longer covered by this Standard.
- 4 For guidance on the correct use of residual current operated protective devices (RCDs) for household and similar use, see IEC TR 62350.
- 5 For EMC tests, see IEC 61543.

3.3 Requirements of other Standards

Equipment and components incorporated in an RCD or relay, which are depended upon for safety, shall comply with the appropriate requirements of any relevant Standard, unless such requirements are varied herein.

PRCDs that incorporate a control or conditioning function shall, in addition to the requirements of this Standard, comply with the relevant requirements of AS/NZS 3197.

4 CLASSIFICATION**4.1 General**

RCDs and relays shall be classified as follows:

- (a) *Type I* RCDs and relays with $I_{\Delta n}$ not exceeding 10 mA a.c.

Operate on a residual sine wave current (a.c. r.m.s. not exceeding $I_{\Delta n}$ 10 mA) and a residual half wave pulsating dc current (d.c. r.m.s. not exceeding 20 mA) with an interrupting time not exceeding 40 ms.

NOTES:

- 1 AS/NZS 61008 and AS/NZS 61009 require the 10 mA sensitivity to include both *Type I* and *General type*.

Type I is defined and is Type A (sine wave and d.c. pulse) with $I_{\Delta n}$ not exceeding 10 mA a.c. with an interrupting time not exceeding 40 ms at rated residual current.

General type has $I_{\Delta n}$ and may be 6 mA to 500 mA with an interrupting time not exceeding 300 ms at rated residual current. They may be Type A (sine wave and d.c. pulse) or Type AC (sine wave).

AS/NZS 61008.1 and AS/NZS 61009.1 require the *General type* with $I_{\Delta n}$ not exceeding 10 mA a.c. to be marked '**GENERAL TYPE, NOT FOR PATIENT AREAS**'.

This applies to all *General types* with $I_{\Delta n}$ not exceeding 10 mA a.c. both Type A and Type AC irrespective of the number of poles.

- 2 AS/NZS 3003 requires, for patient areas, a leakage protection device (LPD). This is a Type I RCD complying with AS 3190, AS/NZS 61008 or AS/NZS 61009 and additionally should switch all live conductors, i.e. a two pole unit needs to switch active and neutral.

- (b) *Type II* RCDs and relays with $I_{\Delta n}$ exceeding 10 mA but not exceeding 30 mA.

NOTE: This is a general use type in AS/NZS 61008.1 and AS/NZS 61009.1.

- (c) *Type III* RCDs and relays with $I_{\Delta n}$ exceeding 30 mA but not exceeding 300 mA, without selective tripping time delay characteristics.

NOTE: This is a general use type in AS/NZS 61008.1 and AS/NZS 61009.1.

- (d) *Type IV* RCDs and relays with $I_{\Delta n}$ exceeding 30 mA but not exceeding 300 mA, with selective tripping time delay characteristics.

NOTE: This is a Type S (Selective) in AS/NZS 61008.1 and AS/NZS 61009.1.

- (e) *Type FS* An RCD which automatically opens on failure of the supply voltage or continues to provide protection.

In New Zealand PRCDs are required to be Type FS.

- (f) *Type AC* RCD with a.c. sine wave sensitivity only, complying with the tests in Table 5.

NOTE: Test methods to this Standard and AS/NZS 61008 and AS/NZS 61009 differ but they all satisfy the requirements for operation on residual sine wave currents.

- (g) *Type A* RCD with a.c. sine wave and d.c. pulse sensitivity complying with the tests in Table 5 and Table 6.

In New Zealand PRCDs designed to provide protection from electric shock are required to be Type A.

NOTE: Test methods to this Standard and AS/NZS 61008 and AS/NZS 61009 differ but they all satisfy the requirements for operation on residual sine wave and half wave direct currents.

4.2 Portable residual current devices (PRCDs)

These devices are further classified as follows:

- (a) *Class L* A single phase PRCD primarily intended for household and similar general use.
- (b) *Class H* A PRCD primarily intended for general industrial use.
- (c) *Class PSOA* A PSOA is a *Class H* PRCD socket-outlet assembly fitted with an integral 30 mA RCD, integral MCB overcurrent protection and with two or more single phase or three phase socket-outlets complying with AS/NZS 3112, AS/NZS 3123 or IEC 60309. Each socket outlet has individual multi-pole switches operating on all live conductors. The assembly is protected against mechanical damage and has a minimum IP rating of IP 33.

NOTE: A PSOA to this Standard complies with AS/NZS 3012.

5 DESIGN AND CONSTRUCTION

5.1 Enclosures

5.1.1 Relay enclosure(s)

The relay enclosure(s) shall be effectively sealed by the manufacturer so that access to relay components and to adjustments is not possible without breaking seals. The manufacturer's setting facility shall not be exposed and shall not be capable of being readily tampered with.

5.1.2 Enclosure of a PRCD or PSOA

A PRCD shall be housed in an enclosure that affords double insulation in accordance with the requirements of 'Equipment with double insulation' stated in AS/NZS 3100, between the external surface of the enclosing case and any wiring and component that does not form part of the protected circuit. The enclosing case shall also be double-insulated from any earth conductor incorporated in the PRCD.

5.2 Encapsulation and sealing

Where an RCD, or any component of an RCD, is encapsulated or filled by a compound or the like, the encapsulating or filled medium shall not leak during any test required by this Standard.

5.3 Corrosion protection

Parts of metal other than thermal elements, shall be either inherently resistant to, or treated so as to make them resistant to, atmospheric corrosion.

5.4 Mounting facilities

Any enclosure designed for surface mounting shall be provided with a method of fixing that is secure and that does not produce undue strain on the enclosure or impair the operation of the enclosed components.

5.5 Insulating material

Any insulating material shall comply with Clause 8.2, except that where an RCD or relay is incorporated in another piece of equipment, and such equipment is covered by another Standard, the temperatures for the tests of Clause 8.2 shall be those specified in the equipment Standard.

5.6 Spacing between terminals intended for field wiring

The spacing between terminal screws or clamping devices of opposite polarity intended for field wiring, and terminals intended for field wiring and earthed metal, shall be not less than 12 mm unless—

- (a) there is an interposing barrier of adequate mechanical strength; and
- (b) such a barrier extends at least 1.5 mm beyond the face of the terminal screws or clamping devices;

in which case the spacing shall be not less than 9 mm (see Figure 1).

The spacing shall be measured as follows:

- (i) By the same technique as for clearances, such as a 'string line', except that the measurement will be made only in the plane in which a tool would be used to connect and disconnect conductors.
- (ii) With the RCD mounted in accordance with the manufacturer's instructions and connected with cables having a cross-sectional area as determined in AS/NZS 3100:2017, Table 8.12 'Standard cross-sections of copper conductors corresponding to the rated thermal current' or, with a busbar as specified by the manufacturer.

NOTES:

- 1 Refer to AS/NZS 3100:2017, Annex C, 'Measurement of creepage distances and clearances' for guidance on the measurement of clearance.
- 2 See Figure 1 in this Standard (AS/NZS 3190) for guidance on the use of a barrier to meet the requirements enabling a spacing of 9 mm to be used.

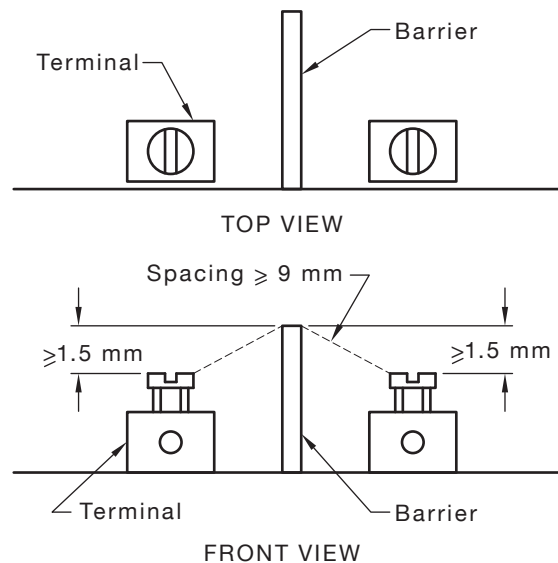


FIGURE 1 GUIDANCE ON USING A BARRIER TO COMPLY WITH 9 mm REQUIREMENT

5.7 Portable devices

5.7.1 Socket-outlet faceplate

Socket-outlet faceplates shall comply with the appropriate requirements stated in AS/NZS 3112:2011, Clause 3.6.3 'Socket-outlet faceplate' or the requirements of AS/NZS 3123 or IEC 60309 as appropriate.

NOTES:

- 1 The AS/NZS 3112 requirement allows for full insertion of plug-in devices, the maximum size of which is not limited, and also prevents inadvertent or partial operation of any switch by the plug-in device during insertion or withdrawal.
- 2 This requirement will not necessarily permit manual operation of any switch with the plug-in device inserted.

5.7.2 Flexible cord

Any flexible cord provided with a PRCD for the purpose of connecting the supply shall—

- (a) comply with the relevant requirements of AS/NZS 3191, AS/NZS 60227.5 or AS/NZS 60245.4 as appropriate;
- (b) for *Class L*, be not inferior to a 3-core ordinary duty type;
- (c) for *Class H* or *Class PSOA*, be not inferior to a heavy duty sheathed type;
- (d) have conductors with a cross-sectional area of not less than 1 mm²; and
- (e) comply with Clause 5.7.8.3.

5.7.3 Connection by pins

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If pins are provided for engagement with the contacts of a socket-outlet, such facilities shall satisfy the requirements stated in AS/NZS 3100:2017, Clause 3.10, 'Equipment intended to be supported by contacts of socket-outlets' and the requirements in Appendix J of AS/NZS 3112:2011 'Equipment with integral pins for insertion into socket-outlets'.

5.7.4 Mechanical strength

The enclosing case of a PRCD, or of any reeling or coiling arrangement, shall be of robust construction and adequate mechanical strength.

Compliance shall be checked by the test of Clause 8.20.

5.7.5 Outlet facilities

5.7.5.1 Outlet facilities on PRCDs

A PRCD shall be provided with—

- (a) one or more socket-outlets complying with AS/NZS 3112 or the requirements of AS/NZS 3123 or IEC 60309 as appropriate;
NOTE: 'One or more' applies to all ratings. Unwanted tripping (reliability of supply) from overload or residual current may limit the application.
- (b) one cord extension socket complying with AS/NZS 3120, AS/NZS 3123 or IEC 60309;
- (c) flexible cord;
- (d) terminal facilities for the connection of a flexible cord;
- (e) one or more lampholders complying with AS/NZS 3117 or AS/NZS 3140; or
- (f) a combination of Items (a) to (e).

A PRCD shall not—

- (i) incorporate a plug portion having only two pins and an outlet providing for the connection of other than a 2-pin plug or a 2-core flexible cord;
- (ii) except for lampholders, incorporate a plug portion having an earthing pin and an outlet not provided with an earthing terminal or contact;
- (iii) have a socket outlet providing for the connection of a plug having a current rating exceeding that of the plug portion of the RCD or the current carrying capacity of the power supply flexible cord;

Exception: A PRCD may have a single 15 A socket outlet and no other outlet facilities on a 10 A rated unit. This is conditional on the 10 A supply cord and 10 A plug being protected against overload by a 10 A MCB, integral with the PRCD, complying with AS/NZS 3111 or AS/NZS 60898.1 as per Clause 6.2.2.3.

NOTE: A PSOA requires a minimum of two socket outlets and this exception does not apply.

- (iv) have a socket outlet with polarity differing from that of the plug portion of the RCD.

5.7.5.2 Outlet facilities on a PSOA

A PSOA shall have two or more socket-outlets complying with AS/NZS 3112, AS/NZS 3123 or IEC 60309 series or any combination thereof.

5.7.6 Earthing continuity

5.7.6.1 General

PRCDs shall provide earthing continuity between the earthing pin of the plug and the earthing contact of each socket-outlet, in accordance with AS/NZS 3100.

In addition, the earthing continuity of socket-outlets shall not rely solely on—

- (a) contact through the revolving axle of the cable reel; or
- (b) a single brush or single spring-loaded revolving contact.

NOTE: The use of two brushes or a combination of the methods described in Items (a) and (b) is considered satisfactory.

5.7.6.2 Particular requirements for Type FS devices

The standing current in the functional earth circuit of Type FS devices shall not exceed 1 mA in both the open and closed positions, when supplied at $1.1 \times$ rated voltage.

Compliance shall be verified by test of Clause 8.13.

5.7.7 Means of connection to the supply

A1 | PRCDs shall be provided with facilities for connection to the supply by either one of the following:

- (a) A power supply cord and plug:
 - (i) The plug for connecting the supply to a PRCD, other than a PSOA, shall comply with the requirements of Clause 5.7.8.1.
 - (ii) The plug for connecting the supply to a PSOA shall comply with the requirements of AS/NZS 3112, AS/NZS 3123 or IEC 60309 series.
 - (iii) The power supply cord shall comply with Clause 5.7.8.2 and Clause 5.7.8.3.
- (b) For pins that are intended to engage with the contacts of a socket-outlet and support the PRCD, the pin configuration shall comply with the requirements of Clause 5.7.8.1.

5.7.8 Power supply cord assembly**5.7.8.1 Plugs**

Plugs, intended to be inserted into a socket-outlet designed for use with 3-pin flat-pin plugs of the type conforming with AS/NZS 3112:2011, Figure 2.1 (in part), 'Dimensions of plugs' describing three-pin plugs (10 A, 15 A or 20 A, 250 V max.), shall—

- (a) have a pin configuration conforming with AS/NZS 3112:2011, Figure 2.1 (in part), 'Dimensions of plugs' describing three-pin plugs (10 A, 15 A or 20 A, 250 V max.);
- (b) be connected to the flexible cord as specified in AS/NZS 3112; and
- (c) comply with the relevant requirements of AS/NZS 3112.

5.7.8.2 Power supply cord attachment

The power supply cord shall be assembled with the RCD by one of the following methods:

- (a) Type X attachment.
- (b) Type Y attachment.
- (c) Type Z attachment.

5.7.8.3 Length of supply flexible cords or flexible cables

The maximum total cord lengths shall be as shown in Table 1 and Figure 2.

The minimum and maximum cord lengths to the RCD part and to the outlet facility shall be as shown in Table 2 and Figure 2.

The cord length shall be measured to the requirements of AS/NZS 3100 from the body of the equipment at the point where the cord or appliance connector enters the body, irrespective of the length of any cord protector, to the centre of the live pins on the face of the plug.