



## Residual Current Devices (RCDs)

This Compliance Guide provides guidance for electrical contractors and practitioners when selecting, purchasing and installing residual current devices (RCDs). For the purposes of this guide the term RCD incorporates RCBO.

For the full requirements for installing RCDs you should refer to the latest edition of AS/NZS 3000:2018 *Electrical Installations* (the Wiring Rules).

### Selecting the correct RCD

AS/NZS 3000 allows RCDs to have any number of poles but must at least disconnect the active conductor. Other Standards such as AS/NZS 3012, AS/NZS 3001 and AS/NZS 3003 require certain circuits to be protected by an RCD that disconnects all live poles. This includes the neutral conductor.

Currently, only RCDs that operate correctly for:

- i. residual sinusoidal alternating current (Type AC), or
- ii. residual sinusoidal alternating current AND residual pulsating direct current (Type A) may be used.

From 1 May 2023 only Type A RCDs may be used in Australia. However, due to the increased use of electronics, solar energy generation and other similar products with a high d.c waveform component it is recommended that Type A are now used.

Type A RCDs are marked as follows:



### Purchasing compliant RCDs

RCDs are classified as Level 3 equipment under the Electrical Equipment Safety System (EESS). This means that they must be registered on the EESS register and be marked with the regulatory compliance mark (RCM). This is in addition to any other marks which indicate the RCD type (such as the Type A mark above). The RCM looks like this:



Marking with the RCM is evidence that the RCD complies with the applicable Australian Standards for RCDs. Only RCDs which are marked with the RCM may be used in electrical installations in Australia. This is important to ensure that RCDs meet minimum safety and quality standards and are appropriate for use in Australia.

Be aware that some RCDs and other electrical equipment that is sold online may not comply with Australian Standards. It is always recommended to only purchase electrical equipment such as RCDs from reputable retailers that offer a recall guarantee. Never purchase or install RCDs unless they are marked with the regulatory compliance mark.

If you are unsure whether an RCD is compliant, request a copy of the certificate of conformity from your wholesaler or supplier before purchasing or installing. You can also search the model number on the EESS register at [www.eess.gov.au](http://www.eess.gov.au)

## When must I install RCD protection?

### Domestic and residential electrical installations

In domestic and residential electrical installations, RCDs must be installed on all of the following:

1. All final sub-circuits in new electrical installations,
2. All new sub-circuits installed in existing electrical installations,
3. Sub-circuits where an addition (not replacement) to that circuit has occurred such as a new luminaire or new socket outlet, and
4. When an entire switchboard is replaced.

In all of the above circumstances, RCDs must be installed at the origin of the final sub-circuit, i.e. at the switchboard.

### Non-domestic and non-residential installations

In non-domestic and non-residential installations, RCDs must be installed on all new final sub-circuits rated at 32A and below that supply:

1. Socket outlets,
2. Lighting,
3. Directly connected hand held equipment, and
4. Directly connected equipment that represents an *increased risk\** of electric shock.

*\*An increased risk of electric shock includes circumstances where damage may reasonably be expected due to one or a combination of factors. These factors include mechanical damage or damage caused by exposure to weather, fauna, flora, water or excessive dampness, seismic action, corrosive fumes, explosive atmospheres, vibration or galvanic action.*

There are also additional requirements in the *Work Health and Safety Act 2012* for RCDs to be installed in workplaces with a certain level of risk. These requirements apply to the person conducting the business or undertaking (PCBUs).

In order to improve the safety of all electrical installations, CBOS is recommending that RCDs be installed on all final sub-circuits in existing electrical installations. Please inform your customers about the importance of RCDs.

## Testing RCDs

### Newly installed RCDs

Clause 8.3.10 of AS/NZS 3000 requires all newly installed RCDs to be tested to ensure correct operation. This may be by the simple method using the integral test button on the RCD or by use of a specialised plug in “trip tester”. This simulates an earth leakage fault activation of the RCD incorporating the field wiring and verifies that the RCD is operating correctly.

Further information on RCD testing methods and results can be referenced in AS/NZS 3017 and AS/NZS 3760.

After tripping of the RCD by one of the methods above, always verify at the RCD that the switched poles are isolated from the supply. Check any electrical equipment installed on that circuit to ensure isolation of the supply voltage.

In all cases, always test the RCD more than once to ensure correct operation post an initial test. Incorrectly installed RCDs will likely trip once and then be irreparably damaged and unable to function again. Testing twice is more likely to detect device failure.

### Existing RCDs

Existing RCDs should be tested according to the recommendations of the equipment manufacturer. This is generally every three months. Existing RCDs can be tested in the same way as newly installed RCDs above. Always ensure the connected equipment is de-energised by the operation of the RCD.

It is good practice to educate your customer on how to test RCDs and the benefits that it provides. You should also advise them to call you back if the RCD fails to operate.

## Connecting installations by others

Electrical installations within prefabricated structures such as site sheds, offices or tiny homes may contain non-compliant electrical equipment including non-compliant RCDs. Be particularly vigilant with structures that have been manufactured outside of Australia.

Do not energise these installations unless you can verify that all of the electrical equipment and wiring is compliant to Australian Standards. Failure to ensure this prior to energising could leave you with the responsibility of rectification.

## Other safety considerations

If safe to do so, prior to any tests, visually inspect the RCD terminals for correct connection and polarity. This helps to confirm whether the RCD would operate as intended and reduces the risk of damage to an incorrectly connected device during trip testing.

It is not good practice to apply an insulation resistance test to installed RCDs. The 500V d.c that is applied during the insulation resistance test may damage the RCD and even some sensitive electrical equipment that is connected to the circuit.

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