

How to classify residual current devices in secondary distribution boxes

Article Overview

Residual current devices (RCDs) in secondary distribution boxes are classified by type, rated residual current, sensitivity, and selectivity to ensure protection against electric shock and fire hazards.

Types of RCDs

- o Type AC - Detects only sinusoidal alternating residual currents. Suitable for general-purpose circuits without electronic loads .
- o Type A - Detects both AC and pulsating DC residual currents. Commonly used in circuits with electronic devices like computers or LED lighting .
- o Type F - Designed for circuits with frequency-converting equipment, such as variable-speed drives, where residual currents may have mixed frequencies .
- o Type B / B+ - Detects AC, pulsating DC, and smooth DC residual currents. Required for circuits with electric vehicle chargers, photovoltaic inverters, or industrial equipment .

Sensitivity and Rated Residual Current

- o Standard sensitivity: 30 mA for personal protection against electric shock .
- o High sensitivity: 10 mA for enhanced protection in special areas like bathrooms or medical facilities .
- o Fire protection: 100 mA or 300 mA for preventing fire hazards due to leakage currents .

Selectivity and Coordination

- o Upstream and downstream RCDs must be coordinated to avoid unnecessary tripping. This can be achieved by:
 - o Using time-delayed (selective) RCDs upstream.
 - o Subdividing circuits so that each downstream RCD protects a specific group of loads .
- o The upstream RCD's non-tripping time should exceed the maximum tripping time of the downstream RCD for all fault currents to ensure total selectivity .
- o Manufacturers may provide RCDs with improved measurement accuracy, allowing selectivity ratios lower than the standard 3:1 between upstream and downstream devices .

Installation Considerations

- o RCBOs combine RCD and overcurrent protection in a single device, useful for individual circuit protection .
- o Placement: RCDs should be installed in secondary distribution boxes according to the load type, sensitivity requirements, and selectivity rules .

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o Testing: Regular testing using the test button ensures proper operation and safety compliance .

Summary

To classify RCDs in secondary distribution boxes, consider:

- o Type (AC, A, F, B/B+)
- o Rated residual current (10 mA, 30 mA, 100 mA, 300 mA)
- o Selectivity (time-delayed upstream, coordinated downstream)
- o Application (personal protection, fire protection, industrial or electronic loads) Proper classification and coordination ensure effective protection against electric shock, leakage currents, and fire hazards while minimizing nuisance tripping in secondary distribution systems .

Which RCD Type? By: Michael Peace CEng MIET Guidance on Residual Current Devices (RCDs), their uses and which one should

Learn how residual current devices work, the difference between RCDs, RCBOs, and ELCBs, what 30 mA and 300 mA

How to get selectivity between residual current protection devices (RCDs): settings and examples.

IEC 60755 describes general requirements for residual current operated protective devices. The add-on Vigi module is

The variety of residual currents that can occur in the main circuit of a household residual current device are reduced in IEC 61008-1

Learn how residual current devices (RCDs) work, their types, and how they protect against electric shock.

Residual Current Devices Abstract: Summary This chapter provides basic information on how a residual current device (RCD) works,

The residual current device continually measures the difference between the value of the outgoing and incoming

Residual current circuit breakers (RCCB) The operating principle of the residual current

RCD Type B: RCD for which tripping is achieved as for Type F and in addition: o for residual sinusoidal alternating currents up to 1

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Since residual current protective devices differ in their suitability for detecting residual current waveforms, the relevant load input

Complete RCD, RCCB and RCBO engineering guide covering sensitivity classes, waveform types, earthing systems,

Residual current devices must be the final protective device, with each appliance connected to a separate RCD.

Under these conditions, the fault current must be detected and cleared by a special device, i.e. a residual-current device (RCD),

The queries vary greatly and cover all aspects of inspection and testing, from the initial verification process of domestic installations

Residual Current Device or Residual Current Circuit Breaker. Construction, Working, Types, Rating and Applications of RCD, RCB

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