Shared residual current device in distribution box



Overview

An accurate protection of people and electrical equipment against leakage currents can be achieved by installing Residual Current Devices (RCDs).

Key Takeaways

A shared RCD in a distribution box protects multiple circuits from earth leakage and electric shock, but careful planning is required to avoid nuisance tripping and ensure safety. What is a Shared RCD? A Residual Current Device (RCD) is a safety device that monitors the current flowing through the live and neutral conductors of a circuit.

If it detects an imbalance, indicating leakage to earth (such as through a person), it trips and disconnects the power almost instantly, typically within 25–40 milliseconds for a 30 mA device, preventing serious electric shock or injury. In a shared RCD setup, a single RCD is used to protect multiple circuits in a distribution board. This is common in domestic or small commercial installations where several circuits, such as lighting and socket outlets, are grouped under one RCD for cost efficiency and simplified protection.

Advantages of a Shared RCDCost-effective: Fewer RCDs are needed compared to individual protection for each circuit. Simplified installation: Reduces wiring complexity in the distribution board. Comprehensive protection: Provides life-saving protection for all circuits connected to it, especially in high-risk areas like kitchens, bathrooms, or outdoor circuits.

© 2026 CGWEB NETWORK INFRASTRUCTURE - All rights reserved

Considerations and Limitations

Nuisance tripping: If one circuit develops a leakage fault, the RCD will trip, cutting power to all circuits it protects. This can be inconvenient if multiple circuits are affected simultaneously. Load balancing: The total leakage current from all connected circuits must not exceed the RCD's rated sensitivity (commonly 30 mA for domestic use) to avoid false trips.

Selective protection: For critical circuits, it may be preferable to use individual RCDs or RCBOs (RCDs with overcurrent protection) to isolate faults without affecting other circuits. Regular testing: Shared RCDs must be tested periodically using the test button to ensure proper operation, as failure could compromise safety for all connected circuits.

Installation Tips

Use a 30 mA RCD for personal protection in domestic environments. Group circuits logically, considering which circuits can tolerate simultaneous disconnection.

Consider RCB

Os for circuits requiring both overcurrent and earth leakage protection individually. Ensure proper labeling in the distribution board to identify which circuits are protected by the shared RCD.

Summary

A shared RCD in a distribution box is a practical and safe solution for protecting multiple circuits from electric shock and earth leakage, provided that the total leakage current is within limits and circuits are grouped thoughtfully. While it reduces cost and simplifies installation, careful planning is essential to minimize nuisance tripping and maintain safety across all connected circuits.

Article Content

Residual Current Devices (RCDs)

An accurate protection of people and electrical equipment against leakage currents can be achieved by installing Residual Current Devices (RCDs).

RCD Switch – Simply explained | Siemens

Safely disconnect the power in the event of a fault with residual current devices (RCDs) — essential in building electrical distribution boards. Here you will learn

Wiring of the Distribution Board with RCD (Residual Current Devices ...

PDF file

© 2026 CGWEB NETWORK INFRASTRUCTURE - All rights reserved

RCD WIRING DIAGRAM - PCREEE

It provide additional protection in area where excessive earth leakage current present. It automatically disconnect the power when an earth leakage current reaches a preset value. RCDs with a sensitivity

TECHNICAL BULLETIN

This publication addresses the requirements for the correct connection of Residual Current Devices (RCDs) and Miniature Circuit-Breakers (MCBs) to power supplies

A complete guide to Residual Current Devices (RCDs)

Fixed RCDs are typically installed in the fuse box or distribution board and provide continuous protection for the entire electrical circuit. This is the perfect type of RCD installation for

SENTRON residual current protective devices (RCD)

Achieve space savings with a compact solution for residual current and line protection. Add a SENTRON 5SM6 AFD unit for protection against fault currents, overcurrent, short-circuits and arcing faults in

Residual-current device

RCDs are designed to disconnect the conducting wires ("trip") quickly enough to potentially prevent serious injury to humans, and to prevent damage to electrical devices. A two-pole, or double-pole,

RCBO Breakers Explained: How They Work, Wiring Diagrams, and

Short for Residual Current Breaker with Over-Current, an RCBO can detect when electric current exceeds a safe threshold or a short circuit occurs. It can swiftly disconnect the circuit when a

Distribution board

Normally, a main switch, and in recent boards, one or more residual-current devices (RCDs) or residual current breakers with overcurrent protection (RCBOs) are also incorporated. In the United Kingdom,

Residual-current device

A residual-current device (RCD), residual-current circuit breaker (RCCB) or ground fault circuit interrupter (GFCI) is an electrical safety device, more specifically a form of earth-leakage circuit

Top Content on LinkedIn

Explore top LinkedIn content from members on a range of professional topics.

© 2026 CGWEB NETWORK INFRASTRUCTURE - All rights reserved

Residual Current Device & Residual Current Circuit

These Residual Current Device (RCD) or Residual Current Circuit Breaker (RCCB) monitors the current balance between the hot and the neutral wires and breaks

How do RCDs work | What is an RCD residual current device

What is an RCD and How Does it Work? RCDs, or Residual Current Devices, are essential safety devices that can help protect you from the dangers of electric shock. After all,

How residual current device (RCD) works?

Figure 1 - Residual current device components The residual current device (rcd) is used to detect earth fault currents and to interrupt supply if an

All about GFCI/RCD devices

A GFCI (Ground Fault Circuit Interrupter) or RCD (Residual Current Device) is a safety device that is designed to protect against electrical shock.

Enhancing Low-Voltage Distribution Network Safety through ...

Residual current protection can detect and isolate the grounding (leakage) fault of low-voltage distribution networks in time, which is an essential technical measure to reduce electric

Resolve a DOI Name

Resolve a DOI Name Type or paste a known DOI name exactly—including its prefix and suffix—into the text box below and then ''submit'' to resolve it. DOIs include a prefix (prefixes always start with 10.)

Wired for Safety: The Crucial Role of Residual Current Devices (RCD ...

Wired for Safety: The Crucial Role of Residual Current Devices (RCD) Powerful electrical currents run through our homes and workplaces, unseen but essential. And if you''re someone

© 2026 CGWEB NETWORK INFRASTRUCTURE - All rights reserved

Contact Us

Continue your research online:

Website: https://cgweb.co.za
Technical inquiry: https://cgweb.co.za/project-enquiry.html

This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

© 2026 CGWEB NETWORK INFRASTRUCTURE - All rights reserved