MASHWORTH SERVICES
Professional - Reliable - Electrical

How RCDs Work

Understanding RCDs (Residual Current Devices)

Residual Current Devices (RCDs) are a key part of modern electrical safety.

They are designed to automatically disconnect the power if a fault is detected, helping to protect against electric shock and reduce the risk of fire.

This guide explains what an RCD does, how it works, and what you should know as a homeowner.

RCD protection forms a fundamental part of modern consumer units. If you're unsure what a consumer unit is or whether yours needs upgrading, you can read our **guide on consumer units**.

What an RCD Does

An RCD continuously monitors the flow of electricity in a circuit.

Under normal conditions, electricity flows out through the live conductor and returns through the neutral - these should always be equal.

If a fault occurs, such as through a damaged cable or accidental contact, some of that electricity may flow somewhere it shouldn't.

When this happens, the RCD detects the imbalance and switches off the supply almost instantly.

Why This Matters

This rapid disconnection is critical because:

- It helps prevent serious electric shock
- It reduces the risk of electrical fires
- It provides protection that older installations do not offer

Without RCD protection, these types of faults may go undetected.

How an RCD Works (Simple Explanation)

Electricity should flow out and return evenly.

If even a small amount “leaks” - typically as little as 30 milliamps - the RCD detects this difference and disconnects the circuit in a fraction of a second.

This rapid disconnection drastically reduces the risk of serious injury or electrical fire

Technical Overview (For Those Who Want More Detail)

Inside the device, the live and neutral conductors pass through a sensing coil.

Under normal operation, their magnetic fields cancel each other out.

If a fault causes current to leak to earth, this balance is disturbed. The device detects the difference and triggers a trip mechanism, disconnecting the supply.

RCDs used for personal protection are typically rated at 30mA and must operate very quickly to reduce the risk of harm.

This allows the device to detect extremely small imbalances in current that would otherwise go unnoticed.

RCDs and Modern Consumer Units

RCD protection is a key part of modern electrical installations.

In many systems, RCDs are combined with circuit breakers into a single device known as an RCBO, which provides both fault and overcurrent protection on individual circuits.

If you’re unsure what type of protection your installation has, you can read our guide on consumer units**.**

Testing and Maintenance

RCDs should be tested regularly using the built-in “TEST” button.

- Recommended: every 3 months
- The power should switch off immediately
- If it doesn’t, it should be checked by a qualified electrician

Regular testing helps ensure the device continues to operate correctly.

During inspections, such as an Electrical Installation Condition Report (EICR), RCD protection is assessed to confirm it is operating as intended.

Additional Protection Devices (AFDDs)

Some installations may also include Arc Fault Detection Devices (AFDDs).

These are designed to detect certain types of faults — such as damaged cables or loose connections — that may not be identified by standard protective devices.

They are not required in all installations, but in some cases may be recommended.

If you'd like to understand this in more detail, you can read our **guide on AFDD protection**.

Summary

RCDs are one of the most important safety devices within an electrical installation.

They automatically disconnect the supply when a fault is detected, helping to protect both people and property.

If your installation does not include RCD protection, it may not meet current safety standards.

If you're unsure whether your installation includes RCD protection, or you've been advised that an upgrade may be needed, we're happy to help.

You can learn more about **consumer unit upgrades** or **get in touch** to discuss your installation