



Electrical
Safety
First



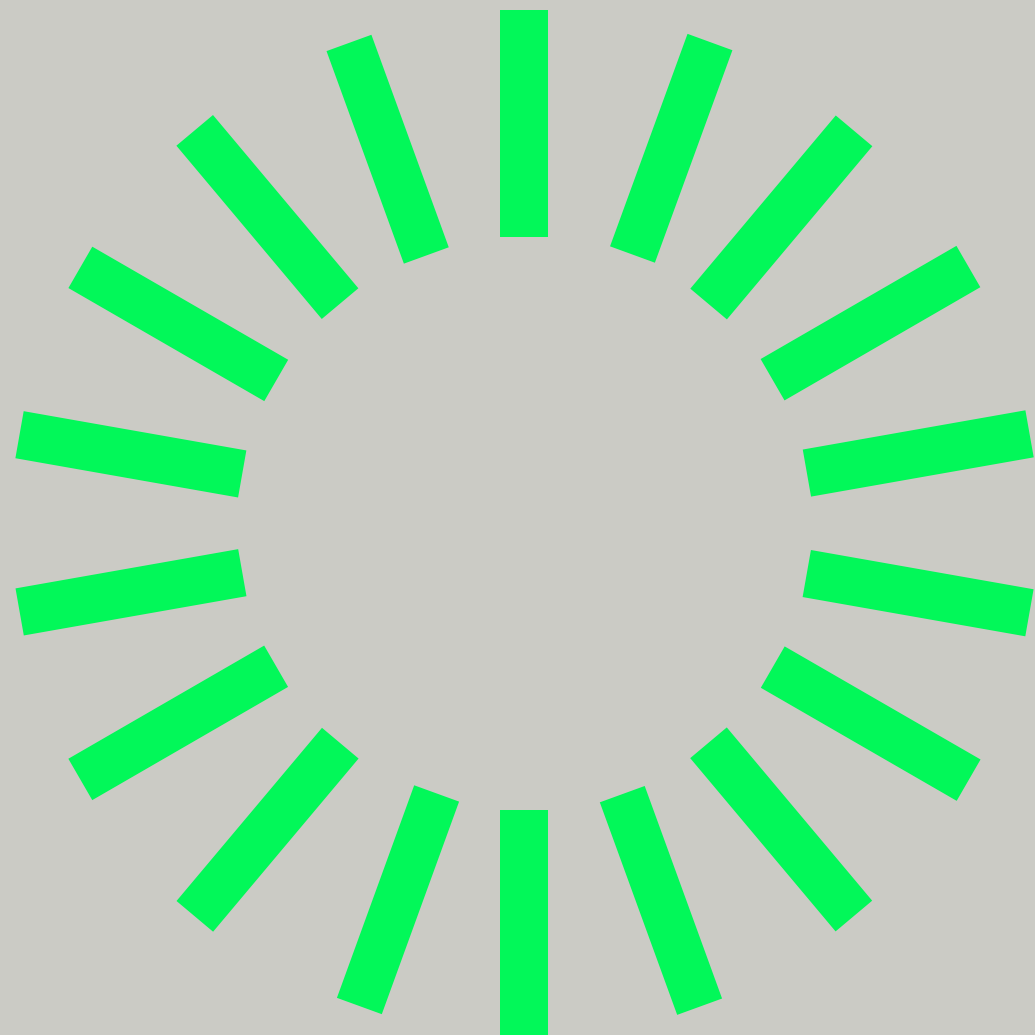
Photovoltaics

Situation in the UK

Presented by: Richard Harvey

October 2024

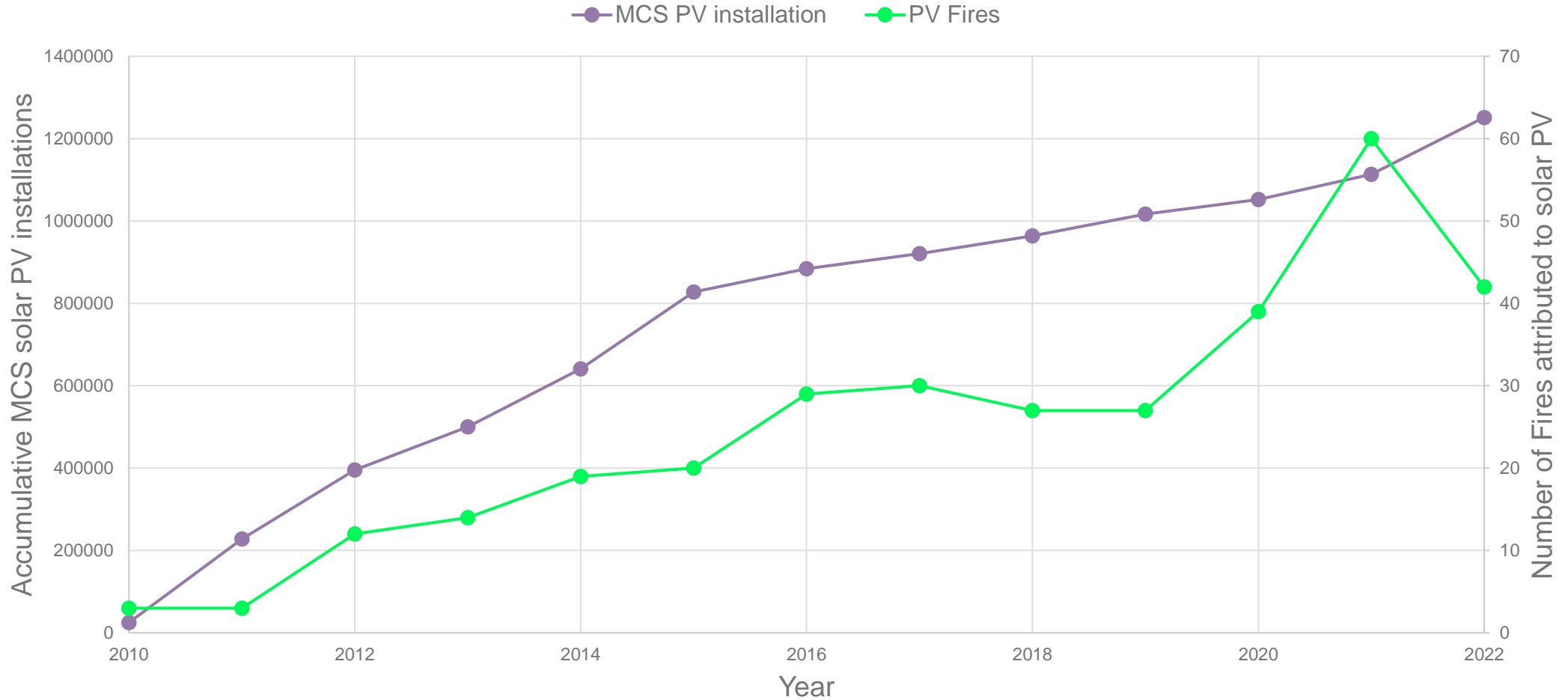
Powering change +
saving lives.



SECTION 1

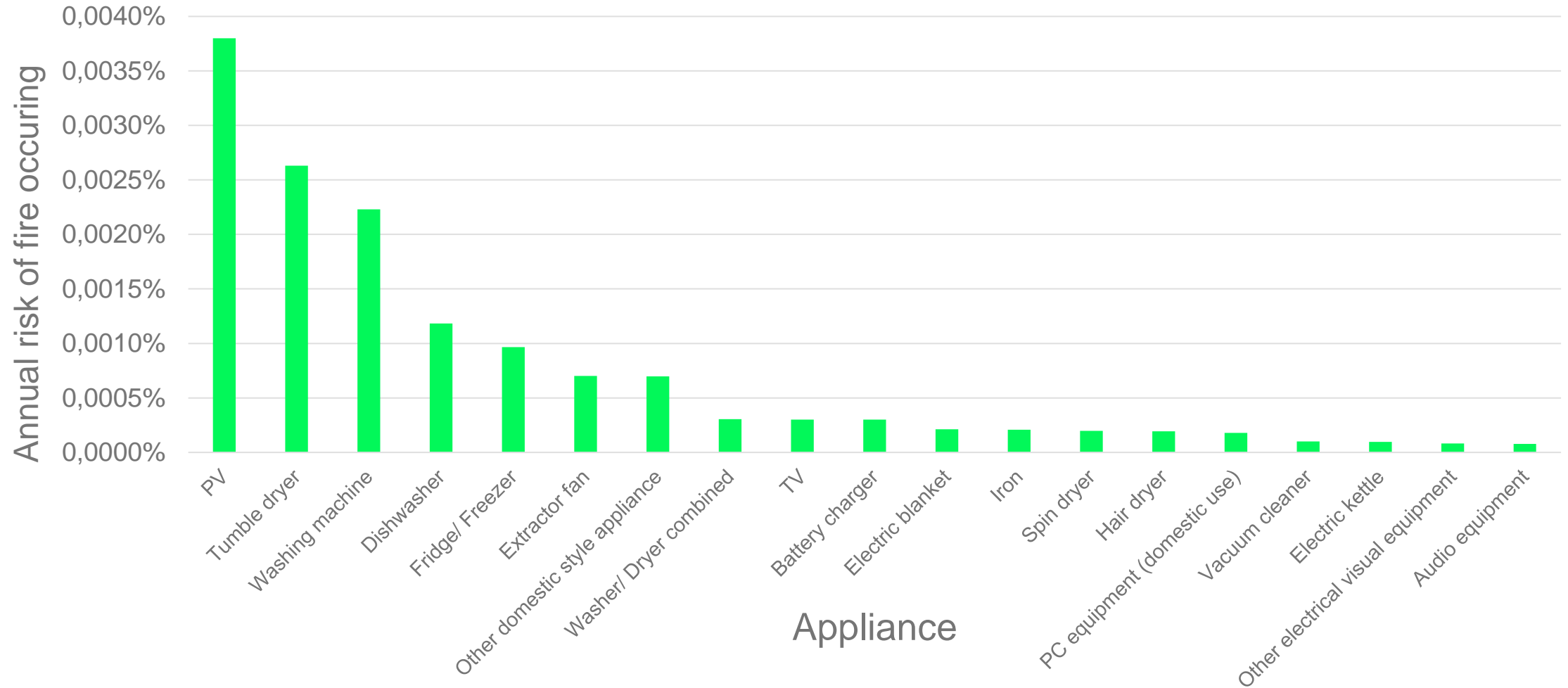
PV

Cumulative MCS registered PV installations vs number of UK fires attributed to PV (England)



Source: Compiled data: MCS PV registrations & Home office statistics for PV-attributed fires

Annual risk of appliance fires including PV

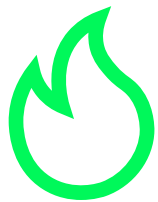
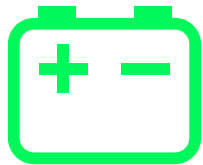
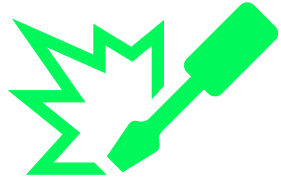
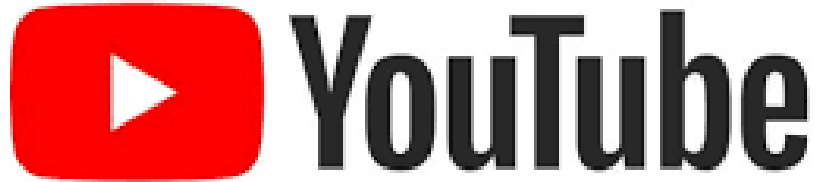


Source: Compiled data: Domestic fire appliance data set & Home office statistics for PV attributed fires

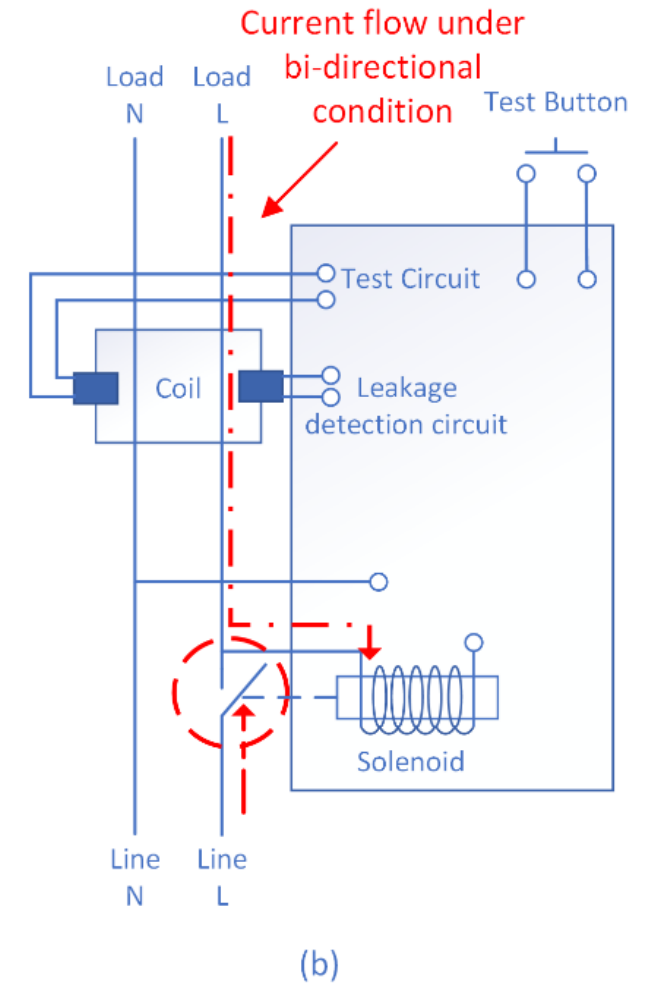
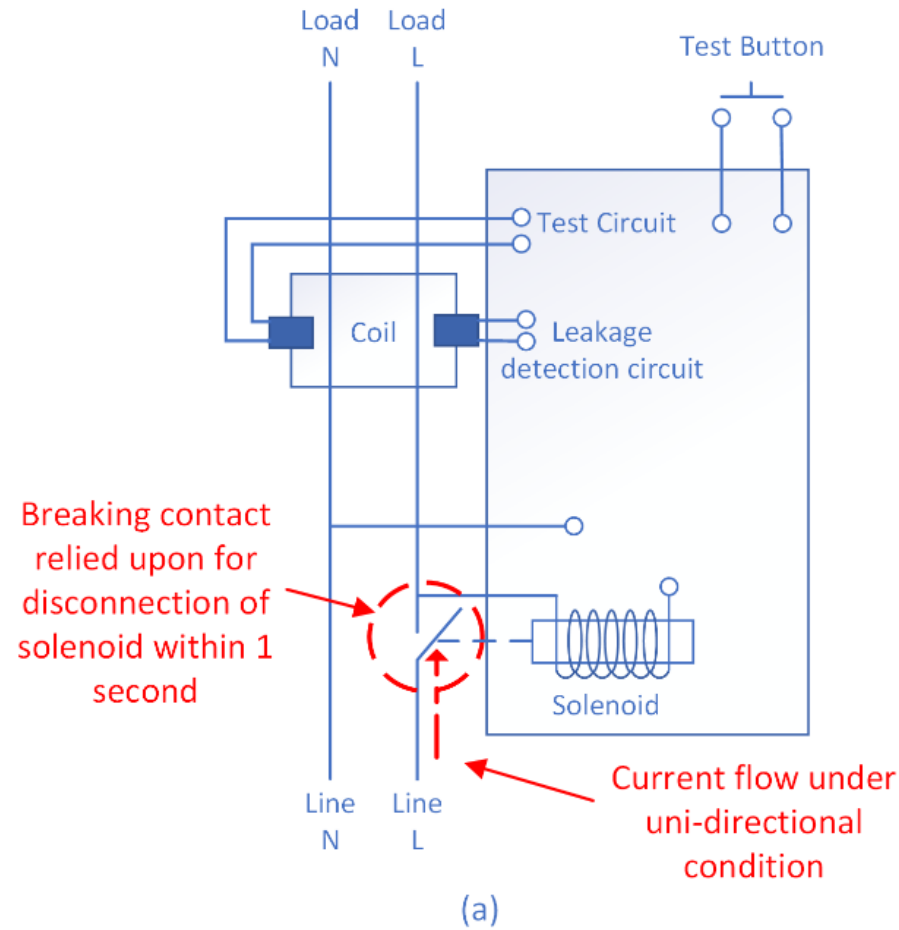
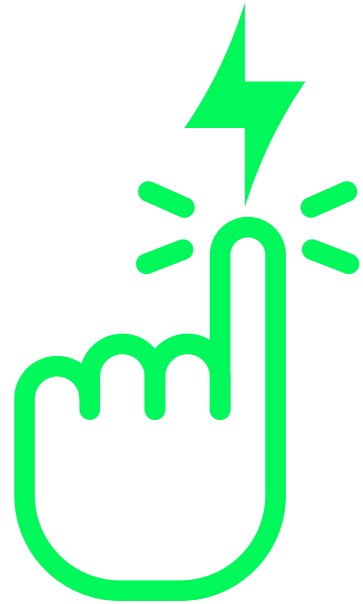
Consequences and severity



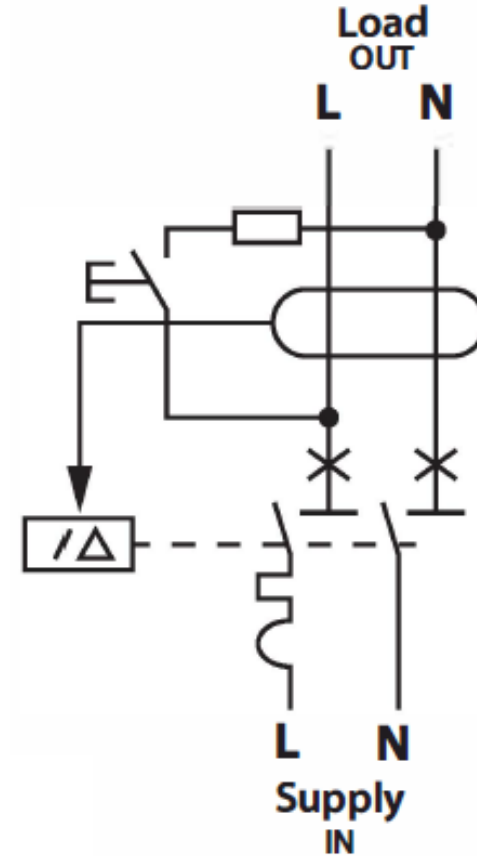
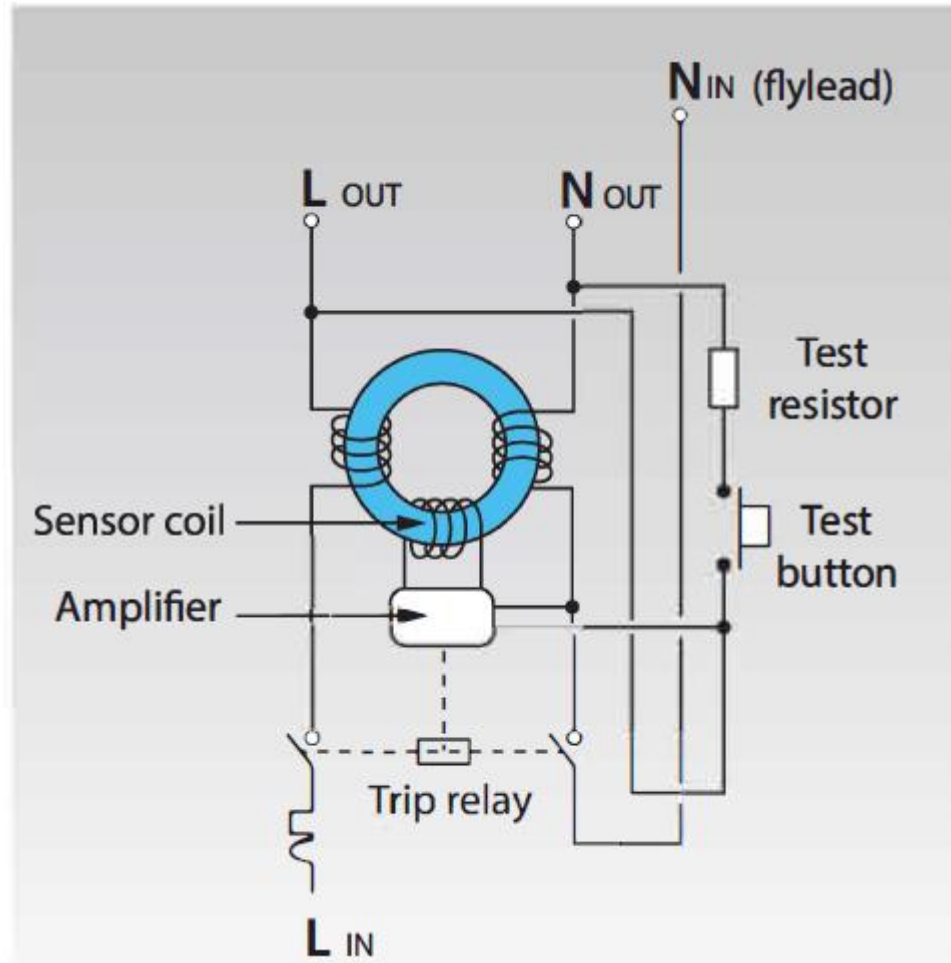
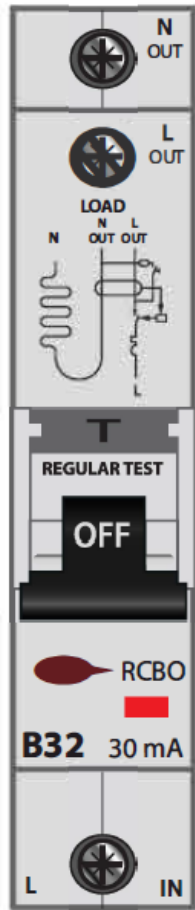
Consequences and severity



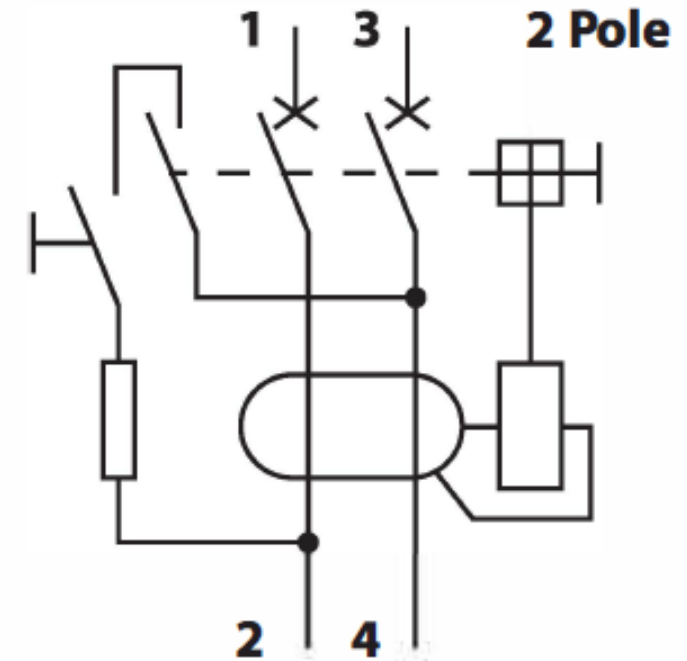
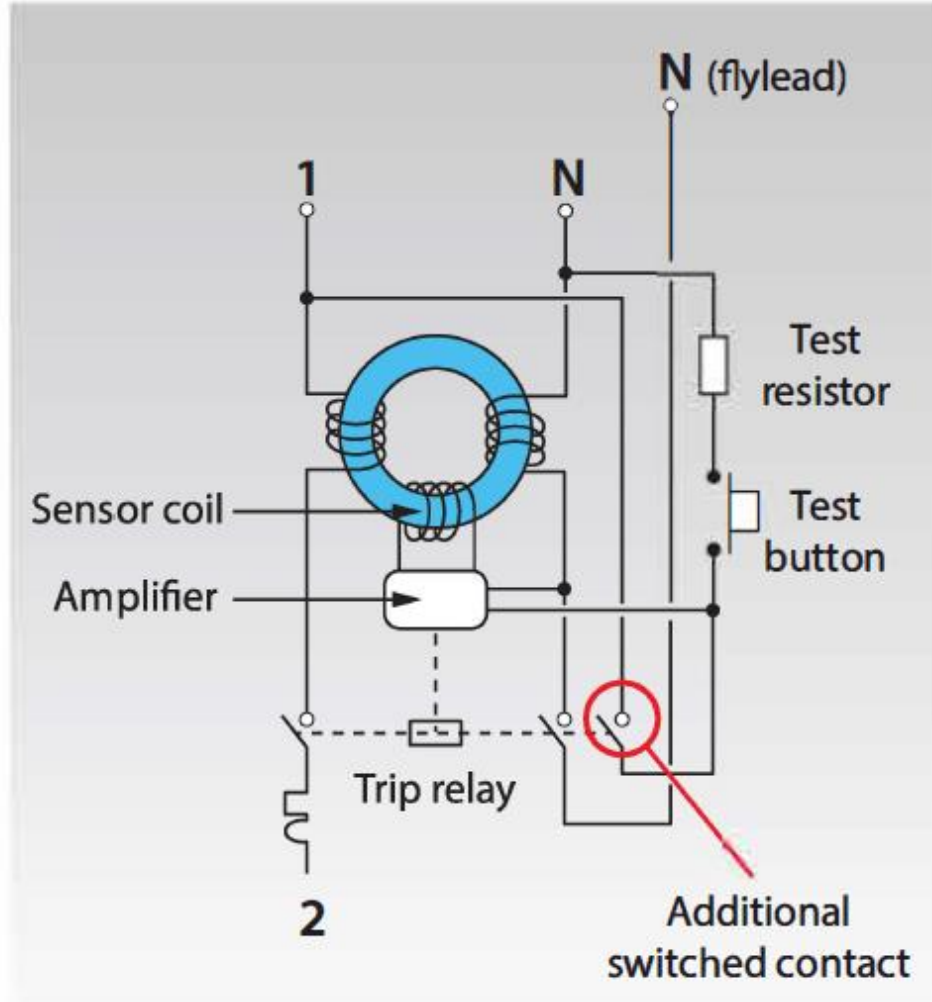
Electrical anomalies: Uni-directional protective devices



Electrical anomalies: Uni-directional protective devices




Electrical anomalies: Bi-directional protective devices



Uni/bidirectional protective devices

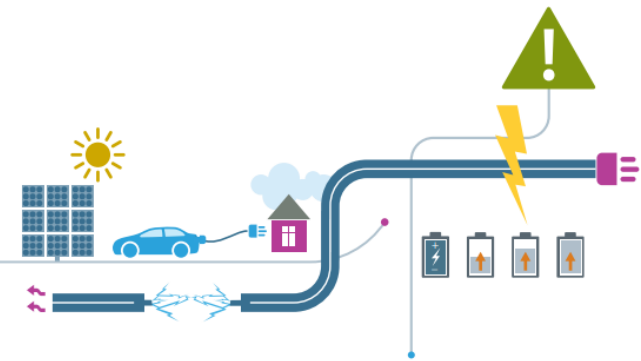
Industry Guidance



Bringing power to life.

TECHNICAL BULLETIN

Connection of Unidirectional and Bidirectional Residual Current Devices (RCDs) and Miniature Circuit-Breakers (MCBs) to power supplies e.g. battery storage, Photovoltaic (PV) systems, Electric Vehicles (EV) to home, a micro-generator, or grid (mains) supply



March 2024

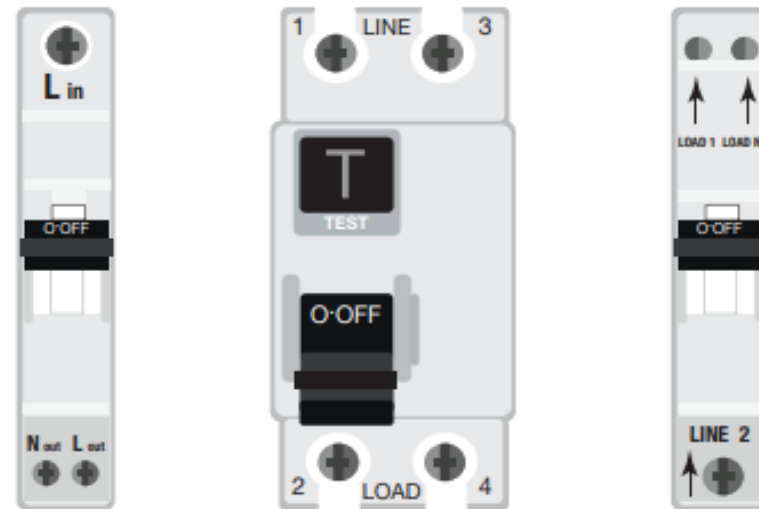


Figure 2.



Examples of devices marked with "in" and "out" or "line" and "load" or arrows indicating the direction of power flow (**unidirectional**) where it is **unacceptable** to connect any power supply to the load and out terminals.

Terminal marking may be on the side of the device. It should not be assumed that a bidirectional device indicates that all previous versions of the same or similar product are also bidirectional.



Uni/bidirectional protective devices Industry Guidance



SAFETY CHECKLIST

Miniature circuit breakers (MCBs)/Residual current operated circuit-breakers without integral overcurrent protection (RCCBs)/Residual current operated circuit breaker with integral overcurrent protection (RCBOs)

This Checklist outlines simple measures to help identify counterfeit and non-conforming products.

Non-conforming products present significant risks to people and property and carry serious consequences for the distributor and installer of such products. Non-conforming products will not ensure protection against fire or electrocution, potentially resulting in lethal consequences. Choose your electrical circuit protection products with care.

The main function of a miniature circuit breaker (MCB) is overcurrent protection. It must interrupt electrical current in the case of a short circuit or an overload current flowing in an electrical circuit.

The main function of a residual current operated circuit-breaker without overcurrent protection (RCCB) is that it must interrupt electrical current in the case of a leakage current to earth.

The main function of a residual current operated circuit breaker with integral overcurrent protection (RCBO) is protection against overcurrent and earth leakage. It must interrupt electrical current in the case of:

1. Short circuit or overload current in an electrical circuit, or
2. A leakage current to earth.

Performance criteria is defined by the appropriate product standard e.g. BS EN 60898, BS EN 61008, BS EN 61009. Manufacturers/suppliers must be able to provide, when requested, relevant documentation proving conformance with standards and legislation (e.g. declaration of conformity, technical file).

CHECK 1 – General Quality Indicators

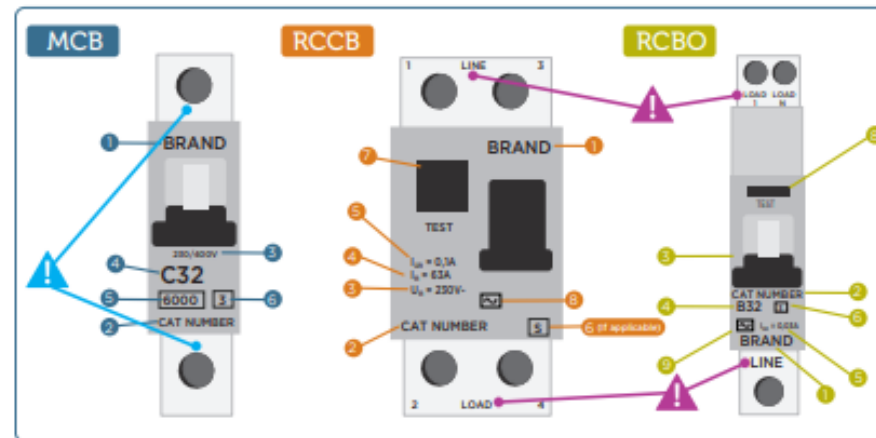
- Imperfections in moulded case finish?
- Presence of excess material / jagged edges on the outer casing of mouldings?
- Visible corrosion of metal components (terminal clamps / screws)?
- Is the product CE and/or UKCA marked? (Marking indicates conformity with all applicable European and/or UK legislation)
- Illegible, poorly aligned or smudged markings?

One or more of the above quality indicators could indicate a non-conforming product. Products without CE and/or UKCA marking are non-conforming.

CHECK 2 – Other Factors to Consider

- Purchasing Channel – do you know and trust the person / organisation offering you this product?
- How does the weight of the product compare to similar products with which you are possibly more familiar? (A lightweight product could indicate the absence of critical components).
- Can your supplier provide you with a copy of a Type Test Certificate to prove conformity?
- Does the Type Test certificate come from a recognised laboratory / authority?
- BS7671 18th Edition states that devices and components installed in assemblies shall only be those declared suitable by the assembly manufacturer. Incompatible devices / assemblies could result in overheating and failure.
- Extreme care must be exercised if you are offered previously used circuit protective devices as the service of these devices will be unknown. It is impossible to know the internal condition and protection capability of a used circuit protective device.

CHECK 3 – Does the product carry all of the required key markings?



Skills and qualifications



Home / Routes to Qualification /

Electrician Plus



The **Electrician Plus** (or Electrician +) model in the UK is an initiative by The Electrotechnical Skills Partnership (TESP).

[It emphasizes the importance of qualified electricians in the installation of low carbon and renewable technologies, such as solar photovoltaic \(PV\) panels, battery storage systems, and electric vehicle charging points \(EVCP\)](#)

Skills and qualifications



Overview of the Electrician Plus model:

- 1. Core Competence:** It builds on the foundational skills of a qualified electrician. Once someone reaches this status, they can upskill through Continuous Professional Development (CPD) and additional qualifications in specific new technologies.
- 2. Qualifications:** The model includes various industry-approved qualifications, such as those from City & Guilds and EAL, which are designed to ensure safe and competent installations.
- 3. Industry Recognition:** The Electrician Plus logo is used to endorse relevant qualifications, indicating they are industry-approved in terms of content and assessment.

This model helps electricians stay current with evolving technologies and ensures high standards in the installation of renewable energy systems.



**Electrical
Safety**
First

Thank you

Electrical Safety First is the UK charity dedicated to reducing fires, deaths, and injuries caused by electricity. Recognised as the leading technical authority on home electrical safety, we campaign on behalf of consumers and work with policy makers and stakeholders to improve electrical safety regulation and reduce electrical risk.

electricalsafetyfirst.org.uk

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