

Electricity with the Modular System

Fault to frame

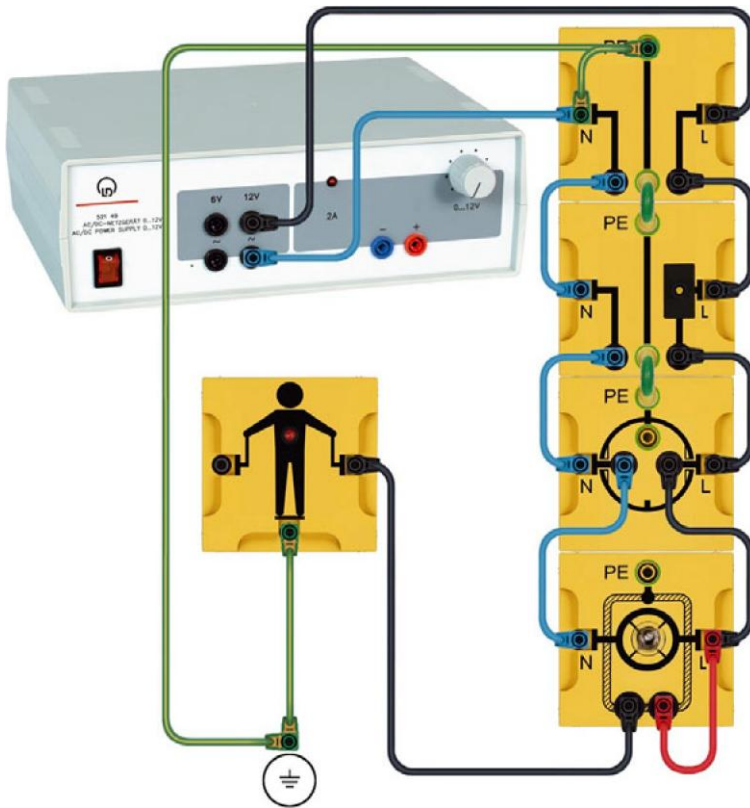
Electrical Safety in the Household

The human being in an electrical circuit

Objective of the experiment

To demonstrate the effect of a fault to frame when touching an electrical load.

Setup



Apparatus

1	539 087	Model fuse, BST
1	539 086	Model outlet, BST
1	539 089	Model person, BST
1	539 088	Load with housing, BST
1	539 090	Lead component PE, N, L; BST
1	521 49	Power supply, 12 V, AC
3	500 602	Safety connection lead, 10 cm, blue
3	500 604	Safety connection lead, 10 cm, black
1	500 601	Safety connection lead, 10 cm, red
1	500 600	Safety connection lead, 10 cm, yellow/green
2	500 591	Safety bridging plugs, yellow/green
1	500 622	Safety connection lead, 50 cm, blue
2	500 624	Safety connection lead, 50 cm, black
2	500 640	Safety connection lead, 1 m, yellow/green
Recommended		
1		Distribution box with earthing socket

Carrying out the experiment

- Switch on the power supply (12 V, AC).
- Produce a fault to frame at the load (connect the phase conductor L to the socket at the housing).
- Connect one of the model person's hands to the housing's other socket at the load.
- Observe the light emitting diode on the model person.

Observation

The light emitting diode lights up.

When you touch the housing at the consumer, a current flows through the human body.

Evaluation

A fault to frame is an electrically conductive connection between current-carrying components and accessible, electrically conductive components in an electrical load (e.g. metal housing), caused by a failure or breakdown in equipment.

If a person touches anything (e.g. a metal housing) that carries a current due to a fault to frame, a current flows through the human body which, depending on the strength of the current, could be fatally dangerous. In this case, the fuse does not provide any protection to the person.

Note

Accidents caused by a fault to frame can be prevented by covering electrically conducting parts with protective insulation (D 3.8.3.3.a "Fault to frame and protective insulation") or by operating electrical equipment with an earthed safety plug and an earthed safety socket (see D 3.8.3.4.a "Fault to frame and protective conductor").