

Electricity with the Modular System

Double-pole contact

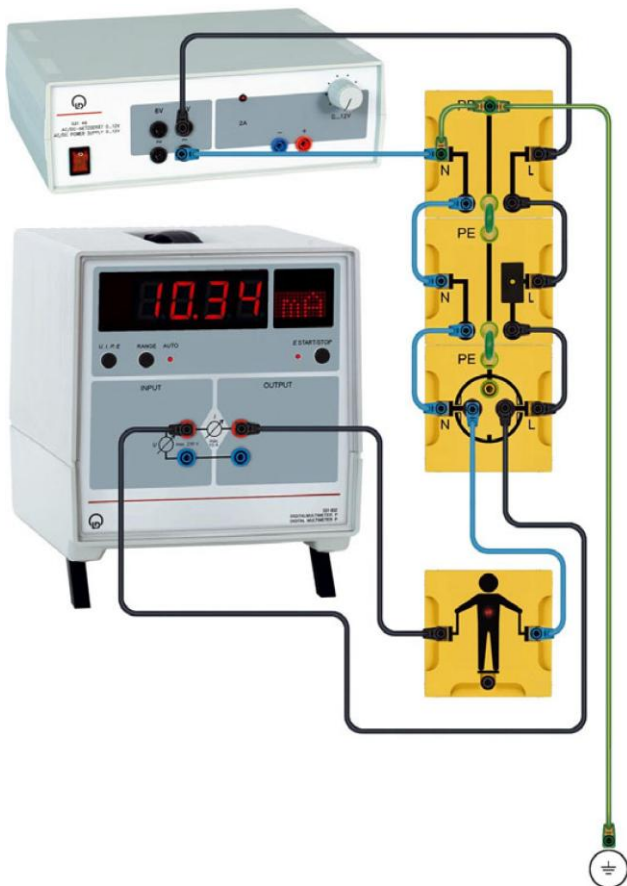
Electrical Safety in the Household

The human being in an electrical circuit

Objective of the experiment

To demonstrate an electric shock in the event of double-pole contact with a wall outlet.

Setup



Apparatus

1	539 087	Model fuse, BST
1	539 086	Model outlet, BST
1	539 090	Lead component PE, N, L; BST
1	531 832	Digital multimeter P
1	521 49	Power supply, 12 V, AC
2	500 602	Safety connection lead, 10 cm, blue
2	500 604	Safety connection lead, 10 cm, black
1	500 600	Safety connection lead, 10 cm, yellow/green
2	500 591	Safety bridging plugs, yellow/green
2	500 622	Safety connection lead, 50 cm, blue
3	500 624	Safety connection lead, 50 cm, black
1	500 640	Safety connection lead, 1 m, yellow/green
Recommended		
1	502 04	Distribution box with earthing socket

Carrying out the experiment

- Connect one of the model person's hands to the outlet's neutral conductor (N) and the other hand to the outlet's phase conductor (L) using the digital multimeter.
- Switch on the power supply (12 V, AC).
- Observe the light emitting diode on the model person and the fuse.
- Read the current I on the digital multimeter.

Observation

The light emitting diode on the model person lights up. The fuse does not trip. A current of approx. 10 mA flows through the model person.

Evaluation

Double-pole contact occurs when a person touches both the phase and neutral conductors simultaneously.

When simultaneously touching both the phase and neutral conductors, the person closes the circuit.

In this experimental example, a current of about 10 mA flows through the human body.

In this case, the person is not protected by a fuse.

However, electrical accidents at home usually do not result from double-pole contact with a wall outlet.

Electrical equipment is often repaired by amateurs who do not previously unplug the main plugs. When the unit is open, there is always a risk of unwanted, simultaneous contact with the phase and neutral conductors.