

Electricity with the Modular System

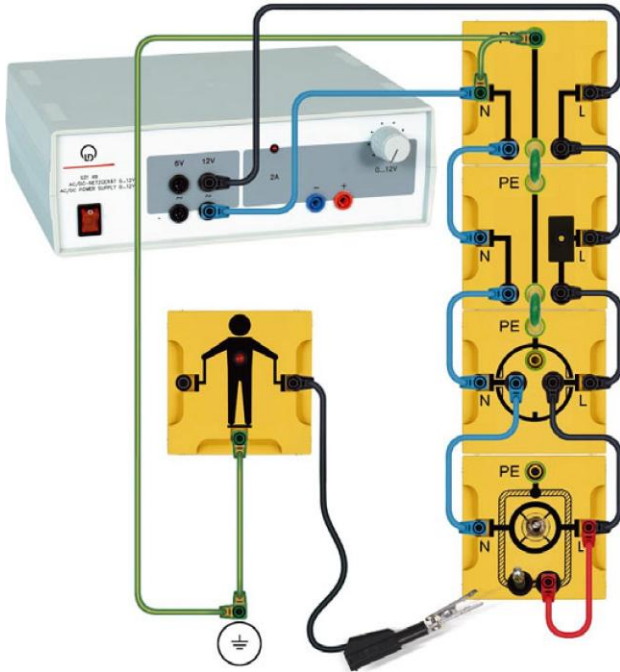
Electrical Safety in the Household
Protective measures

Protective insulation

Objective of the experiment

To demonstrate the mode of operation of a protective insulation in the event of a fault to frame.

Setup



Apparatus

1	539 087	Model fuse, BST
1	539 086	Model outlet, BST
1	539 088	Load with housing, BST
1	539 089	Model person, BST
1	539 090	Lead component PE, N, L; BST
1	from 340 811 ET2	Plug-in axle
1	from 501 861	Croc-clips, bare
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	502 04	Distribution box with earthing socket
1		Insulating tape

Carrying out the experiment

- Switch on the power supply (12 V, AC)
- Insert the plug-in axle in the unused black socket in the load.
- Touch the plug-in axle to the crocodile clip and observe the light emitting diode on the model person.
- Wrap the plug-in axle with insulating tape and repeat the experiment.

Observation

The light emitting diode lights up on the model person when the hand touches the electrically conductive plug-in axle and a current flows through the human body.

If the person touches the plug-in axle wrapped with insulating tape, the LED doesn't light up.

Evaluation

If an electric device is equipped with plastic housing or if the device's accessible conductive parts are coated with plastic (protective insulation), there is no danger to human beings in the event of contact after a fault to frame.

Equipment with protective insulation is identified with the symbol (protection class II).

A tab connector or shrouded plug on the equipment will sufficiently prevent electrical accidents. It is unnecessary to connect the protective conductor to an earthed safety socket (cp. D 3.8.3.4.a "Fault to frame and protective conductor").