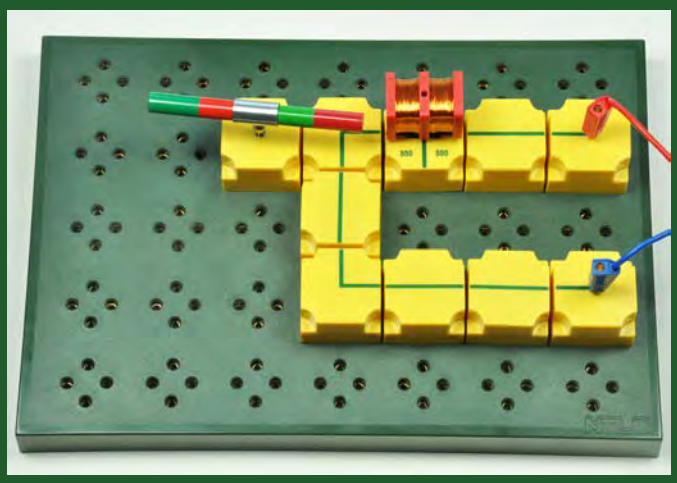
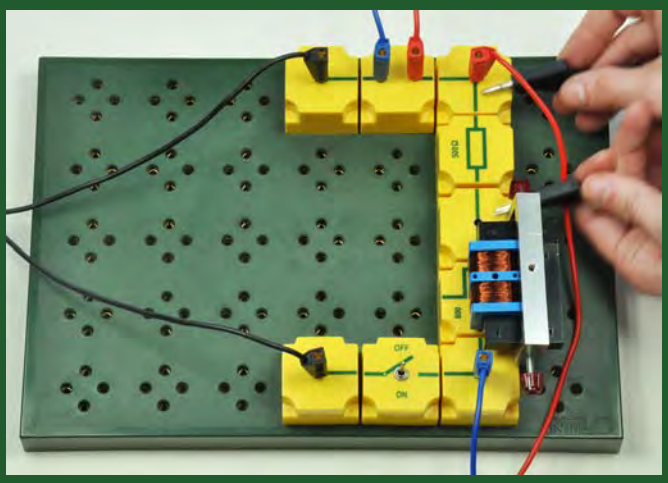
Student Experiments

Manual

ELECTROMAGNETISM

P9160-4P





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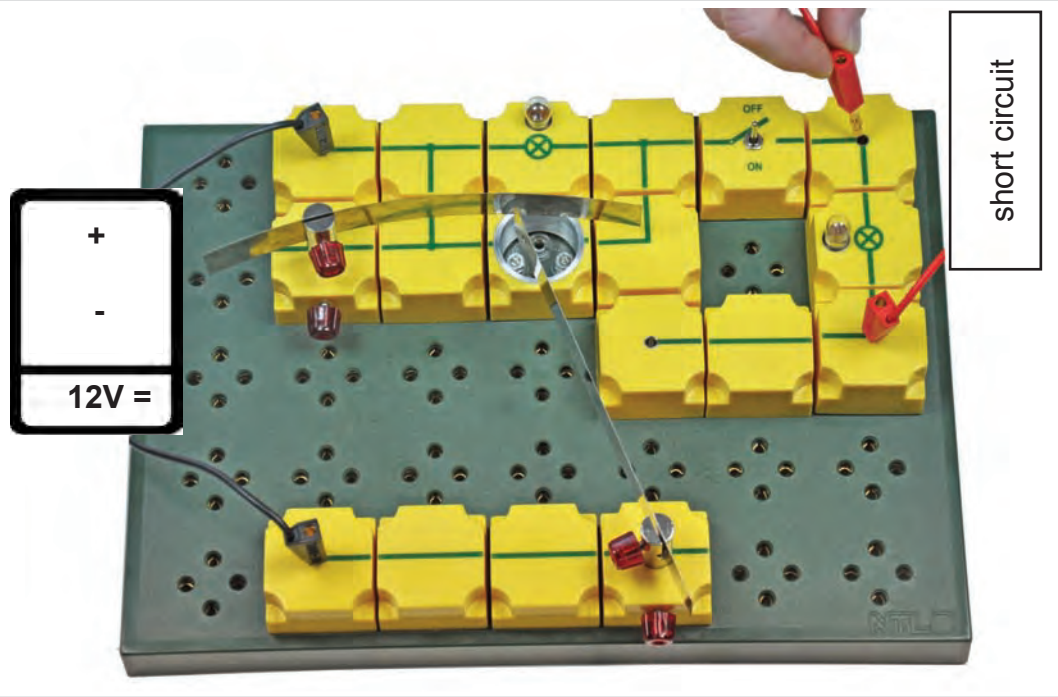
BIMETAL FUSE

ELS 3.6

Required Kit:
P9901-4D Electricity 1
P9902-5P Electromagnetism



Material:
1x Plug-in panel
2x Connecting lead, black
1x Connecting lead, red
3x PIB connector
3x PIB wire, straight
3x PIB wire, T-shaped
2x PIB wire, angled, with socket
1x PIB wire, angled
1x PIB switch, ON/OFF
2x PIB with adapter bush
2x PIB lamp socket, E10
2x Light bulb, 10V/50mA, E10
2x Holder with slit and hole
1x PIB with heating coil
1x Bimetallic strip
1x Flat spring, steel, 0.2mm

Additionally required:
1x Voltage supply

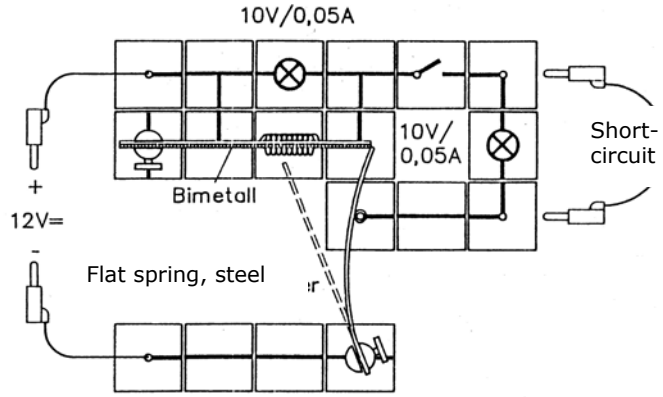
BIMETAL FUSE

ELS 3.6

In einer automatischen Sicherung kann eine Bimetallsicherung als Schutz gegen Überlastung vorhanden sein.

Wiring:

Arrangement of the wiring according to the illustration.



After inserting all plug-in blocks in the circuit board the following arrangements are to be made very carefully:

The flat spring has its neutral position in the position marked by hatching.

Its distance to the crocodile clip with plug pins inserted in A is about 5 mm.
The bimetallic strip outside (patterened side pointed to the front) is moved from the left side towards the end of the flat spring exactly above the heating spiral.
It slightly presses against the crocodile clip with plug pin at A. 12 V DC is applied.

Experiment:

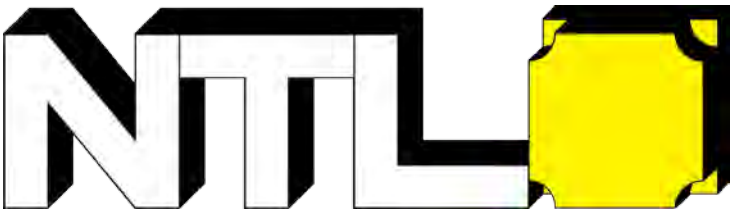
The switch is closed.
The circuit is closed because the flat spring contacts the crocodile clip at A and the right lamp glows.
The upper lamp connected in parallel with the heating spiral does not yet glow.

The right lamp is short-circuited.
Now the upper lamp indicates a voltage through the heating spiral which causes it to glow.
After a short while the bimetallic strip bends and releases the end of the flat spring.
The flat spring springs back to its neutral position, thus the circuit is interrupted.

Conclusion:
A bimetallic strip connected in a certain way may interrupt a circuit because of being heated.

Advice:

1. How long it takes for the disconnection to occur depends on the setup.
2. If no lamp is glowing before the disconnection occurs there is no contact at A.



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