

Electricity with the Modular System

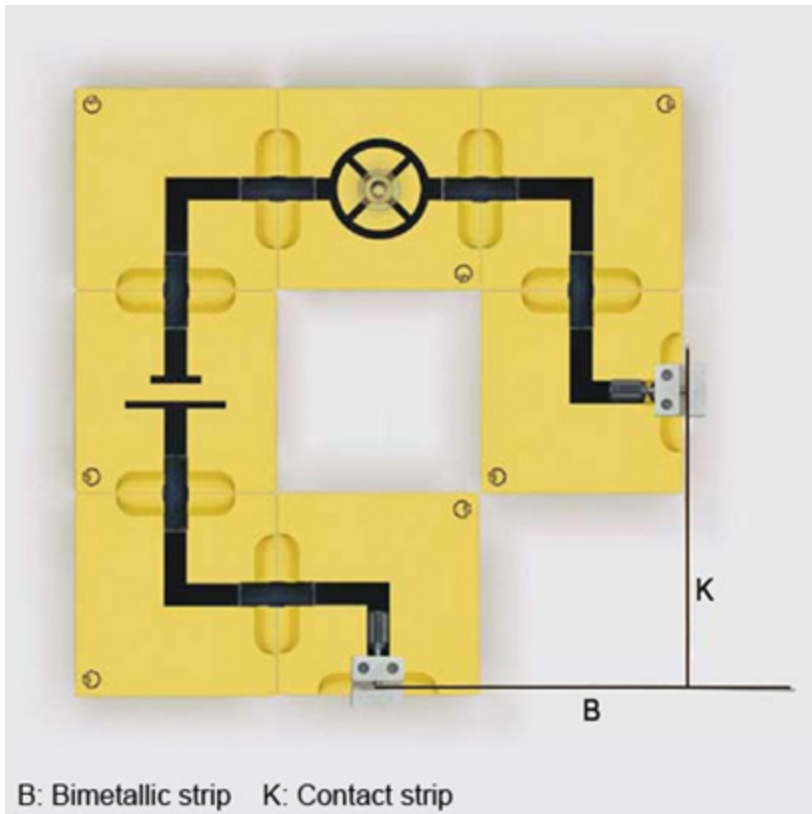
Basic Electric Circuits
Switches in the circuit

Bimetal switch

Objective of the experiment

To demonstrate the layout and working principle of a bimetal switch.

Setup



Apparatus

1		539 024	Lamp socket E10, BST
1	from	505 11	Incandescent lamp, 2.5 V / 0.1 A, E10
2		539 060	Adapter plug, BST
1		539 062	Bimetallic strip, BST
1		539 061	Contact strip, BST
1		539 053	Battery element, BST
5		539 004	Connector blocks BST, 90° angle
6		539 000	Bridging plug, BST
1		301 300	Demonstration experiment frame
1		301 301	Adhesive magnetic board
additionally required			
1			Lighter

Carrying out the experiment

- Set up the circuit. Make sure the bimetallic strip is clamped onto the adapter socket with the marked side up and the lamp lit.
- Heat the bottom side of the bimetallic strip with the flame of the lighter.
- Observe the bimetallic strip and the lamp.
- Remove the flame again.

Observation

When the bimetallic strip is heated, it bends downward. As a result, the circuit is opened through the contact strips and the lamp goes out.

When the bimetallic strip cools down, it returns to its original position. The circuit closes once again and the lamp lights up.

Evaluation

A bimetallic strip consists of two firmly interconnected metal strips made of different materials.

Due to differences in material, the metal strips expand at different rates as they are heated.

The bimetallic strip bends in the direction of the metal strip having a lower linear expansion than the other.

Because of this property, a bimetallic strip can be used as a switch in circuits where the temperature is maintained at a constant value.

Such a switch is called a thermostat and can be used in irons, for example.

When the temperature of the iron reaches a specified maximum value, the bimetallic switch opens the heater circuit. When the iron cools down to a specified minimum value, the heating circuit is closed once again by the bimetallic switch.