

Electricity with the Modular System

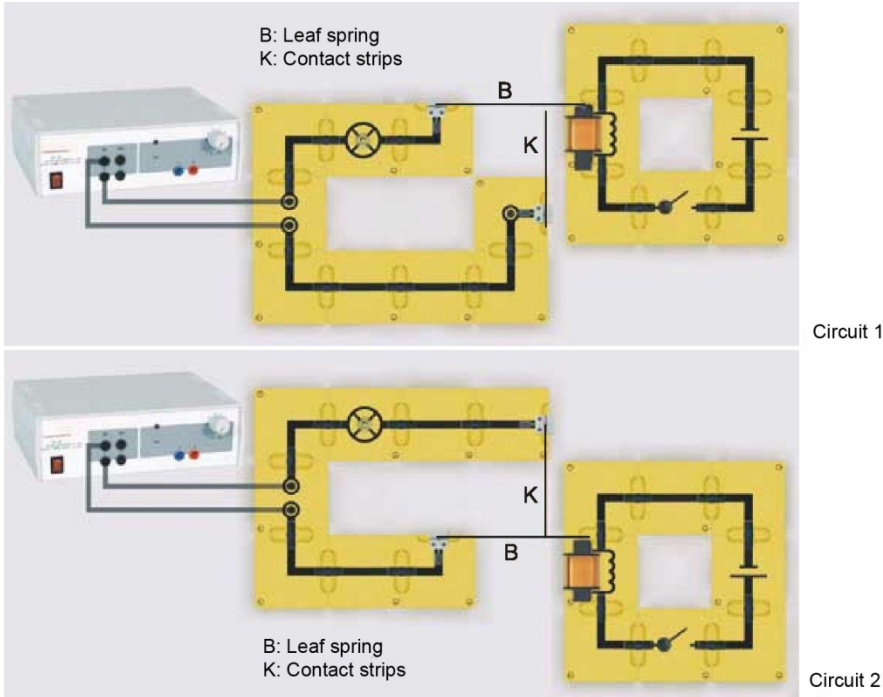
Electromagnetism and Induction
Applications of electromagnetism

Model of a relay

Objective of the experiment

To demonstrate the layout and working principle of a relay with normally open and normally closed contact.

Setup



Apparatus

1	539 052	Coil holder, BST
1	590 83	Coil, STE, 500 turns
1	593 21	Transformer core, demountable
1	539 024	Lamp socket E10, BST
1	505 15	Incandescent lamp, 6 V, 0.05 A, E10
1	539 025	Toggle switch, BST
1	539 053	Battery element, BST
2	539 060	Adapter plug, BST
1	539 061	Contact strip, BST
1	539 064	Leaf spring, BST
4	539 001	Connector blocks BST, straight
1	539 003	Connector block BST, straight, 2 sockets
8	539 004	Connector blocks BST, 90° angle
1	539 005	Connector block, BST, 90° angle, 1 socket
16	539 000	Bridging plug, BST
1	521 49	Power supply, 12 V, AC, 230 V
2	500 644	Safety connection lead, 100 cm
1	301 300	Demonstration experiment frame
1	301 301	Adhesive magnetic board

Carrying out the experiment

- Set up circuit 1.
- Apply a voltage of 6 V (AC) to the operating circuit and close the toggle switch on the control circuit.
- Observe the leaf spring and the lamp.
- Open the switch again.
- Set up circuit 2 and repeat the experiment.

Observation

Circuit 1

After closing the control circuit, the electromagnet attracts the leaf spring. As a result, the contact strips close the operating circuit and the lamp lights up. When the control circuit is opened, the leaf spring returns to its initial position. This causes the operating circuit to open as well and the lamp goes out.

Circuit 2

After closing the control circuit, the electromagnet attracts the leaf spring. As a result, the contact strips open the operating circuit and the lamp goes out. When the control circuit is opened, the leaf spring returns to its initial position. This causes the operating circuit to close and the lamp lights up.

Evaluation

A relay is an electromagnetic switch for turning electrical circuits on or off.

The relay consists of a control circuit with an iron-cored coil.

When the control circuit is closed, a contact is attracted by the iron-cored, current-carrying coil.

As a result, the operating circuit can either be closed or opened.

If the operating circuit is open when the control circuit is open, this is referred to as a relay with normally open contact (Circuit 1).

If the operating circuit is closed when the control circuit is open, this is referred to as a relay with normally closed contact (Circuit 2).

The technical importance of the relay is that an operating circuit with a higher current can be switched by means of a low-current control circuit.