

# Electricity with the Modular System

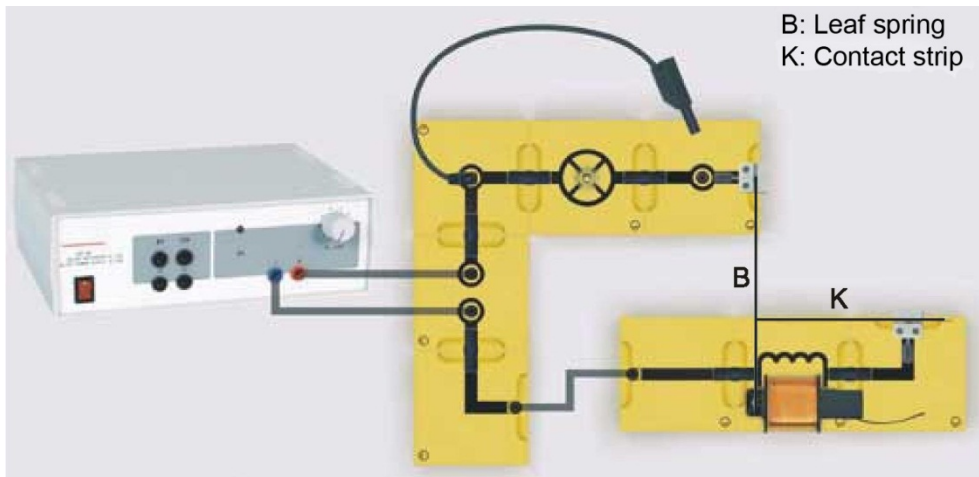
Electromagnetism and Induction  
Applications of electromagnetism

## Magnetic circuit breaker

### Objective of the experiment

To demonstrate the layout and working principle of a magnetic circuit breaker.

### 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       |
| 2 | 539 060 | Adapter plug, BST                         |
| 1 | 539 061 | Contact strip, BST                        |
| 1 | 539 064 | Leaf spring, BST                          |
| 1 | 539 001 | Connector block BST, straight             |
| 1 | 539 002 | Connector block BST, straight, 1 socket   |
| 1 | 539 003 | Connector block BST, straight, 2 sockets  |
| 2 | 539 004 | Connector blocks BST, 90° angle           |
| 1 | 539 005 | Connector block, BST, 90° angle, 1 socket |
| 6 | 539 000 | Bridging plug, BST                        |
| 1 | 521 49  | Power supply, 12 V DC, 230 V              |
| 2 | 500 624 | Safety connection lead, 50 cm             |
| 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 the circuit and apply a voltage of 8 V (DC).
- Insert the iron core with folded out spring about a third of the way into the coil.
- Position the leaf spring about 0.5 cm away from the coil.
- Bypass the lamp with the connection lead while simultaneously observing the iron core and the leaf spring.

### Observation

After bypassing the incandescent lamp, the iron core is attracted far enough into the coil, so that the leaf spring is pushed away and the circuit is opened via the contact strip.

### Evaluation

If the current flow through the coil increases, the magnetic field around the coil increases as well.

As a result, the coil attracts the iron core and presses it against the leaf spring.

The circuit is interrupted by a contact strip.

This is why this setup can be used in a magnetic circuit breaker.

A magnetic circuit breaker is responsible for interrupting a circuit when too much current flows through it.