

Electricity with the Modular System

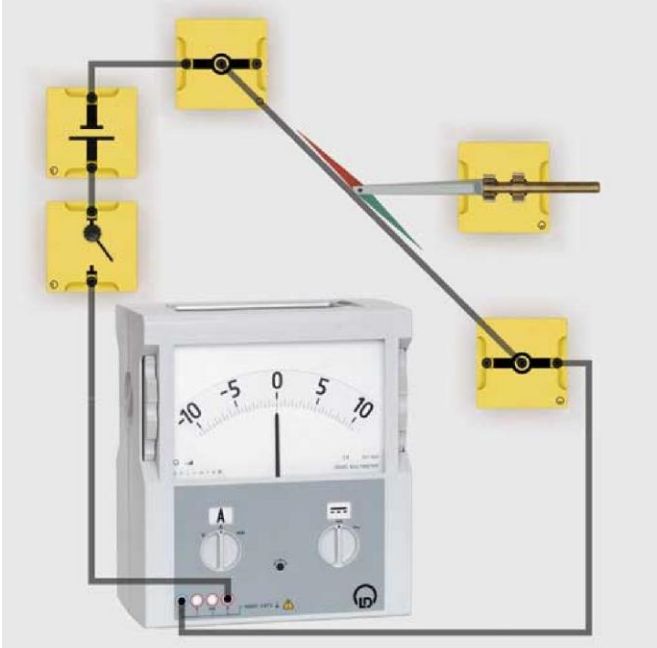
Electromagnetism and Induction
Electromagnetism

Magnetic effect of the electric current

Objective of the experiment

To demonstrate the magnetic effect of an electric current.

Setup



- Attach the dip needle to Connector block BST, straight (539 003) on the magnetic board and wait until the magnetic needle is aligned.
- Then, set up the circuit so that the extended connection lead (500 424) runs parallel to the magnetic needle.

Apparatus

1	514 04	Dip needle
2	590 02	Small clip plug
1	539 025	Toggle switch, BST
2	539 002	Connector blocks BST, straight, 1 socket
1	539 003	Connector blocks BST, straight, 2 sockets
1	531 906	Demo multimeter, passive
1	539 053	Battery element, BST
or		
1	521 39	Power supply, 20 V, 10 A, DC, 230 V
1	500 604	Safety connection lead, 10 cm
1	500 624	Safety connection lead, 50 cm
2	500 644	Safety connection lead, 100 cm
1	500 424	Connection lead, 50 cm, black
1	301 300	Demonstration experiment frame
1	301 301	Adhesive magnetic board

Carrying out the experiment

- Close the circuit with the toggle switch. At the same time, observe both the demo multimeter and the compass needle.
- Open the toggle switch again.
- Reverse the polarity of the circuit and repeat the experiment.

Observation

After closing the circuit, the compass needle aligns perpendicular to the connection lead.

When the circuit is opened, the compass needle turns back to its initial position.

After reversing the polarity of the circuit, the compass needle deflects in the opposite direction.

Reversing the polarity of the circuit results in a direction change in the current.

Evaluation

A magnetic field is created around a current-carrying conductor.

The direction of the magnetic field depends on the direction of the current.

The formation of a magnetic field around a current-carrying conductor is known as the magnetic effect of electric current.

Note

The interaction between current-carrying conductors and magnetic fields was discovered in 1820 by the Danish physicist Oersted.

For this reason, the experiment on the magnetic effect of electric current is also known as the Oersted experiment.