

Electricity with the Modular System

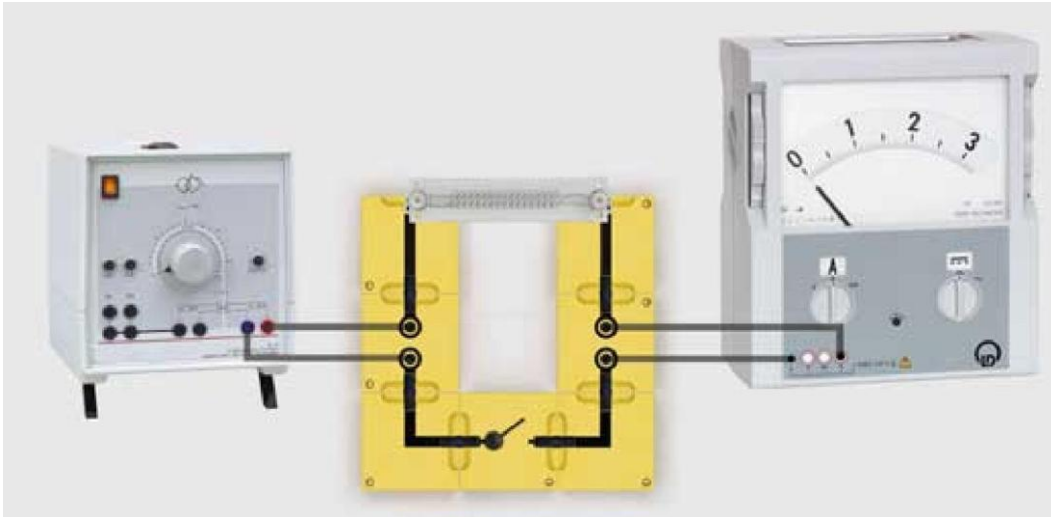
Basic Electric Circuits
Electrical resistance

The thermal and luminous effect of the electric current

Objective of the experiment

To demonstrate the thermal and luminous effect of the electric current in a coiled wire.

Setup



Apparatus

1	567 18	Wire wrapping plate
1	550 47	Chrome-nickel wire, $d = 0.35 \text{ mm}$
2	539 060	Adapter plug
1	539 025	Toggle switch, BST
2	539 001	Connector blocks BST, straight
2	539 003	Connector blocks BST, straight, 2 sockets
2	539 004	Connector blocks BST, 90° angle
6	539 000	Bridging plug, BST
1	531 906	Demo multimeter, passive
1	521 39	Power supply, 20 V, 10 A, DC, 230 V
4	500 644	Safety connection lead, 100 cm
1	301 300	Demonstration experiment frame
1	301 301	Adhesive magnetic board
additionally required		
1		Pencil

Carrying out the experiment

- Wind the chrome-nickel wire (approx. 50 cm) around a pencil to form the most narrow coil possible. Clamp the ends of the wire used for contacting under the clamping screws on the wire wrapping plate.
- Set up the circuit and dim the room slightly.
- Switch on the power supply and increase the current. At the same time, observe the coiled wire.

Observation

At a current of about 3 A the coiled wire starts to glow red-hot.

Evaluation

The increase of temperature in a conductor due to a current flow is called the thermal effect of electric current.

When the conductor begins to glow due to the raise in temperature, it not only radiates heat, but also light.

The emission of light via temperature increase of a conductor due to a current flow is called the luminous effect of electric current.

Notes:

The thermal effect of electric current is useful in hot plates, immersion heaters, hair dryers and melting fuses, for example.

The luminous effect is used particularly in incandescent lamps.