Coil with 5 turns  1000981

Instruction sheet
10/15 ALF

1. Safety instructions

When using the coil with 5 turns, extremely high temperatures are generated during the course of the experiments.

Caution: during spot welding experiments, sparks may jump from glowing metal droplets. Caution: As a result of the action of gravity, the glowing part of the melting nail drops downwards in the experiment requiring the melting of a nail.

- Conduct the experiment on a heat-resistant surface.
- After completing the experiment, allow the apparatus to cool for at least 5 minutes.
- Always switch off the primary voltage before undertaking any assembly/set-up work on the transformer.
- Limit the duration of the experiment to a maximum of approximately 30 seconds.

2. Description

The coil with 5 turns is used as a secondary coil in a high-current transformer in experiments to demonstrate the application of Joule heat.

The coil consists of a copper wire which has been wound around an insulating sleeve in 5 turns. The extended ends of the coil are fitted with wooden handles. The contact pins are held in place with the help of a clamping device.

3. Technical data

Secondary side of the high-current transformer
Short-circuit current:  350 A approx.
Open-circuit voltage:  2.4 V approx.
Number of turns:  5
Wire gauge:  28.25 mm²
Material:  Copper

4. Sample experiments

In order to conduct the experiments, the following apparatus is additionally required:

1 Mains coil @230 V  1000987
1 Mains coil @115 V  1000986
1 Transformer core with yoke and clamps  1000976
1 Set of sheet metal strips  1000982
1 Set of nails  1000983
4.1 Spot welding
- Set up the high-current transformer as shown in Fig. 1 and place it on a heat-resistant surface.
- Attach the contact pins so that they face one another.
- Switch on the web coil and hold a pair of sheet metal strips between the contact pins.
To achieve a strong point weld, take two identical overlapping sheet metal strips and align their corners. Apply gentle pressure and position the corners flush between the electrodes.

4.2 Experiment for melting a nail
- Set up the high-current transformer as shown in Fig. 2 and place it on a heat-resistant surface.
- Turn the clamping device and insert a nail through the holes at the sides.
- Press the handles together and clamp the nail tight with the hand screws.
- Switch on the mains coil.
Owing to the strong current, the nail starts glowing and melts completely after a short while.
- After conducting the experiment, allow the remains of the nail to cool for at least five minutes.