

Current Balance Equipment Set 1019188

Instruction manual

06/16 ALF



1. Description

Equipment set for measuring force on a current-carrying conductor in a magnetic field as a function of the current, of the magnetic field or of the length of the conductor. The force is composed of the apparent change in the weight of the holder for the permanent magnets, which is measured by means of a sensitive set of scales.

2. Contents

1 Folding power feed and holder for conductors
 4 Conductors 1 cm, 2 cm, 4 cm, 8 cm
 1 Holder with 6 permanent magnets
 1 Instruction manual

3. Technical data

Max. current: 5 A
 Weight: 500 g approx.

4. Operation

To perform experiments, the following equipment is also required:

1 Electronic Scale 200 g	1009772
1 DC Power Supply 20 V, 5 A @ 230 V	1003312
or	
1 DC Power Supply 20 V, 5 A @ 115 V	1003311
1 Steel Rod 25 cm	1002933
1 Tripod Stand, 150 mm	1002835
1 Pair of Experiment Leads	1002850

- Set up the conductor holder on the stand base and put it next to the scales.
- Plug in a conductor.
- Connect it to the power supply.
- Place the holder and its permanent magnets on the scales.
- Move the stand base and adjust its height in such a way that the conductors are as far as possible inside the U-shaped holder on the scales without actually touching it anywhere.
- Use the calibration function to adjust the scales to zero.
- To swap over conductors, tip up the frame of the holder.
- In order to change the magnetic field, undo the screws in the holder and remove individual magnets

5. Example experiments

5.1. Lorentz force as a function of current

- Insert 1-cm conductor
- Set a current of 1 A on the power supply and make a note of the reading on the scales.
- Repeat the measurement with current of 2 A, 3 A, 4 A and 5 A.

- Plot a graph of the Lorentz force as a function of current.
- Carry out the same experiment with the other conductors.

5.2. Lorentz force as a function of conductor length

- Insert 1-cm conductor
- Set a current of 5 A on the power supply and make a note of the reading on the scales.
- Repeat the experiment with conductors of length 2 cm, 4 cm and 8 cm, keeping the current the same.
- Plot a graph of the Lorentz force as a function of conductor length.

5.3. Lorentz force as a function of magnetic field

- Insert a 4-cm conductor
- Set a current of 5 A on the power supply and make a note of the reading on the scales.
- Remove permanent magnets from the holder one by one and repeat the experiment after each removal.

Plot a graph of the Lorentz force as a function of the number of magnets.

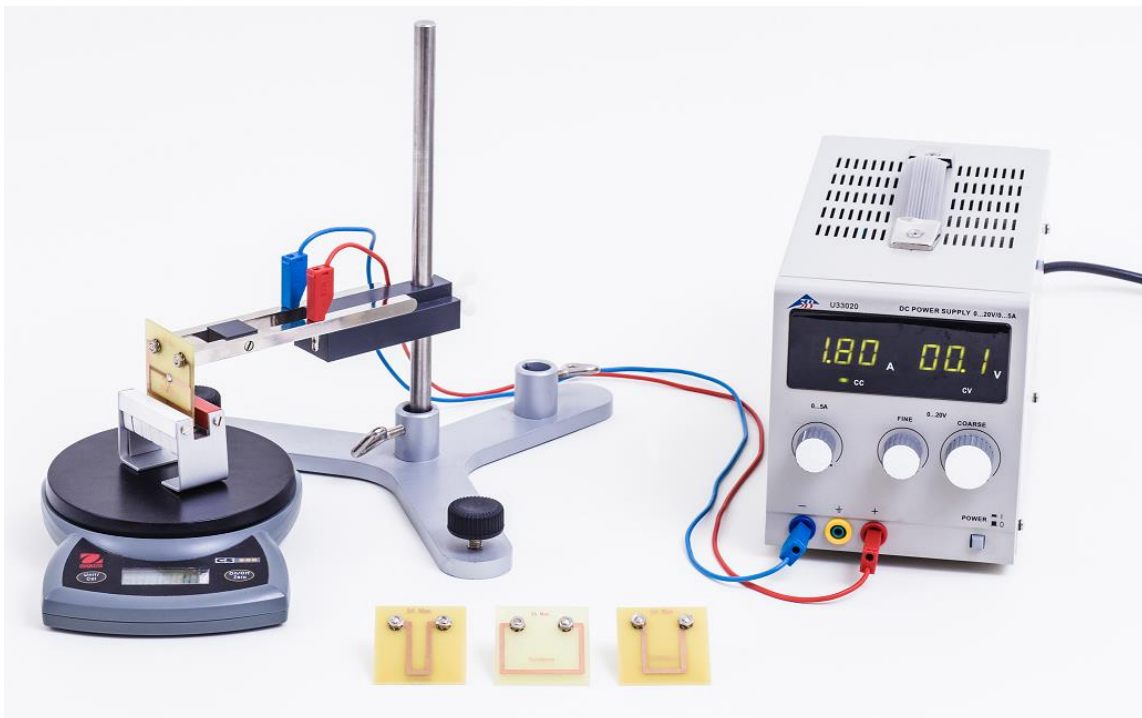


Fig. 1 Measurement set-up