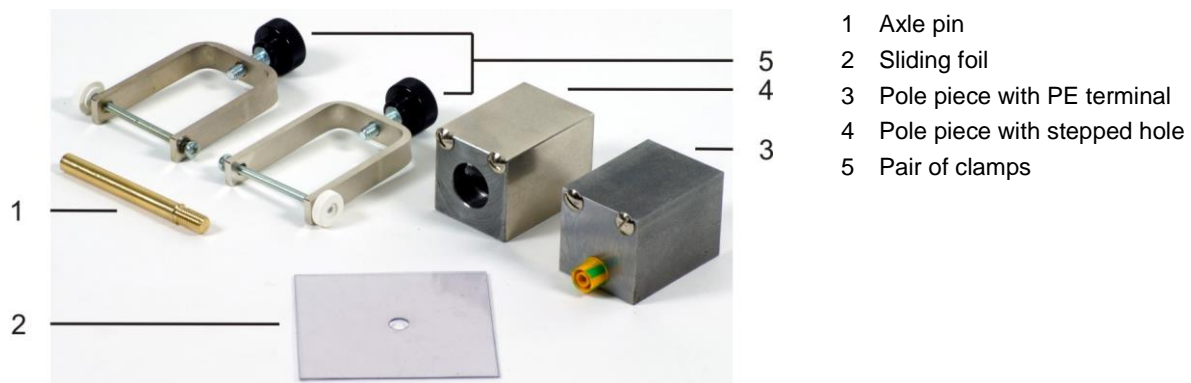


Electromagnet Accessory for Zeeman Effect 1021365

Instruction manual

11/17 TL/UD



1. Safety instructions



Attraction by strong magnetic fields can cause the pole pieces to damage the cadmium lamp.

- Make sure that the pair of screws (safety locks) for both pole pieces are externally flush against the arms of the U-shaped magnet core (Fig. 2).



It is possible for the electromagnet to tip over due to its own weight when secured to optical bench D (1002628) by means of optical base D (1009733).

- Stabilise the optical bench with the help of a set of feet for optical bench D (1012399).
- Before putting the cadmium lamp attached to the electromagnet into operation, always ensure first that the PE socket is connected to the ballast and the pole piece with the PE terminal by means of the yellow and green safety lead (protective earth conductor).

2. Description

The electromagnet accessory makes up a special kit intended for the experiment to demonstrate the normal Zeeman effect. It provides a low-friction rotating bearing between the U-shaped core D (1000979) and the optical base D (1009733) and allows pole pieces and the base plate for the cadmium lamp (1021366) to be attached to the U-shaped core D.

3. Equipment supplied

- 1 Pole piece with PE terminal
- 1 Pole piece with stepped hole
- 2 Clamps
- 1 Axle pin
- 1 Sliding foil

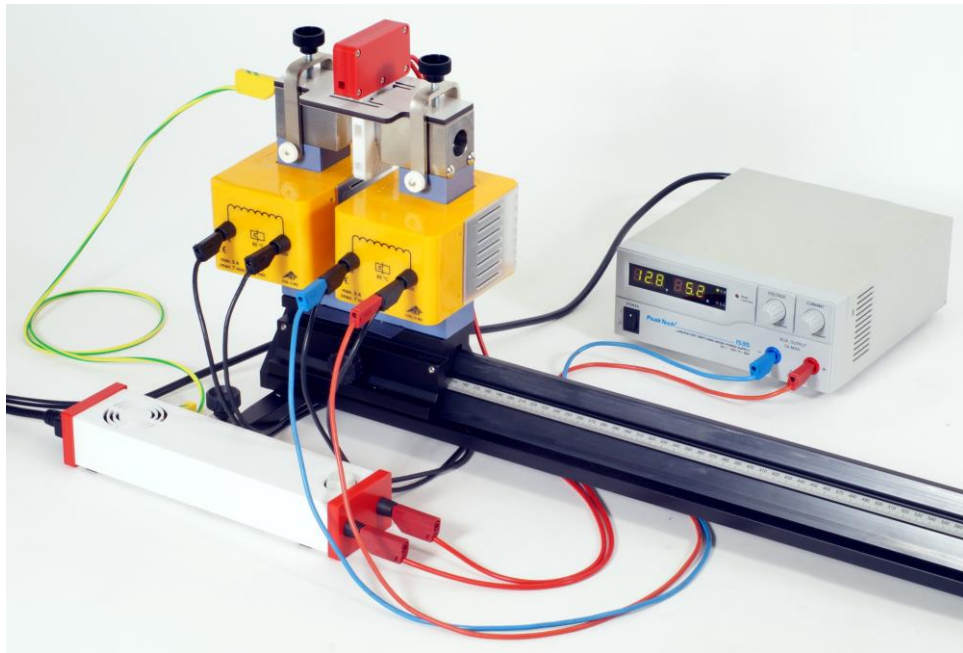


Fig. 1: Fully assembled electromagnet with cadmium lamp attached.

4. Technical data

Pole piece with PE terminal

Dimensions: 40 x 40 x 70 mm³

Pole piece with stepped hole:

Dimensions: 40 x 40 x 70 mm³

Diameter of stepped hole: 5 – 20 mm

Clamps:

Dimensions: 95 x 52 x 16 mm³ approx.

Axle pin:

Dimensions: 8 x 80 mm²

Thread: M8 x 14 mm

Weight: 1.6 kg approx.

5. Additionally required equipment

1 U-shaped core D	1000979
2 Coils D, 900 turns	1012859
1 Optical base D	1009733
1 Optical bench D, 100 cm	1002628
1 Set of feet for optical bench D	1012399
1 Cadmium lamp with accessories	1021366
1 DC power supply, 1 – 32 V, 0 – 20 A @230 V	1012857
1 Set of 15 experiment leads, 75 cm, 1mm ²	1002840

In countries with 110-120 V mains voltage, a power supply unit corresponding to the power supply unit 1012857 is required.

6. Set-up

- Screw the axle pin as far as possible into the optical base by hand.
- First slip the slide foil with hole and then the U-shaped core with hole onto the axle pin and place them all on the optical base.
- Put the coils onto the arms of the U-shaped core as shown in Fig. 1.
- Put the pole pieces onto the arms of the U-shaped core as shown in Fig. 1. Make sure that the conical poles themselves are directly opposite one another and that the flat ends of the pole pieces are flush against the arms of the U-shaped coil (Fig. 2). Use the two pairs of screws to help with the positioning.

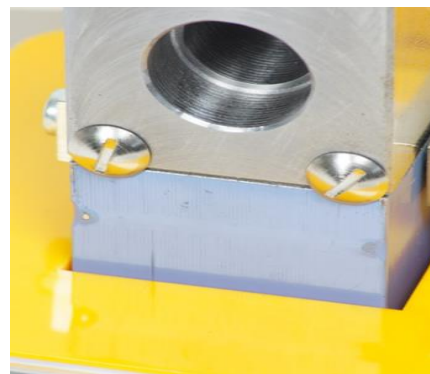


Fig. 2: Pole piece correctly attached to U-shaped core.

As well as helping with positioning, the two pairs of screws also act as safety locks. This ensures that the pole pieces do not damage the cadmium lamp when attracted by strong magnetic fields.

- Attach the cadmium lamp as described in the instruction manual for the cadmium lamp and accessories (1021366).
- Make sure that the PE socket is connected to the ballast and pole pieces with the yellow and green safety experiment lead (protective earth conductor).
- Connect the two coils to the DC power supply with opposing polarities (connect the “0” and “900” taps in each case) (Fig. 1).

The magnetic flux density depends on the current flowing through the electromagnet and can be determined using the calibration curve in Fig. 3.

Note:

Use the output with the 4-mm safety sockets on the front of the DC power supply and for output currents of 0 – 5 A. For output currents of 0 – 20 A use the pole terminal outputs on the back of the DC power supply.

7. Storage, cleaning and disposal

- Keep the equipment in a clean, dry and dust-free place.
- Before cleaning the equipment, disconnect it from its power supply.
- Do not use any aggressive cleaning agents or solvents to clean the equipment.
- Use a soft, damp cloth for cleaning.
- The packaging should be disposed of at local recycling points.
- Should you need to dispose of the equipment itself, never throw it away in normal domestic waste. If being used in private households it can be disposed of at the local public waste disposal authority.
- Comply with the applicable regulations for the disposal of electrical equipment.

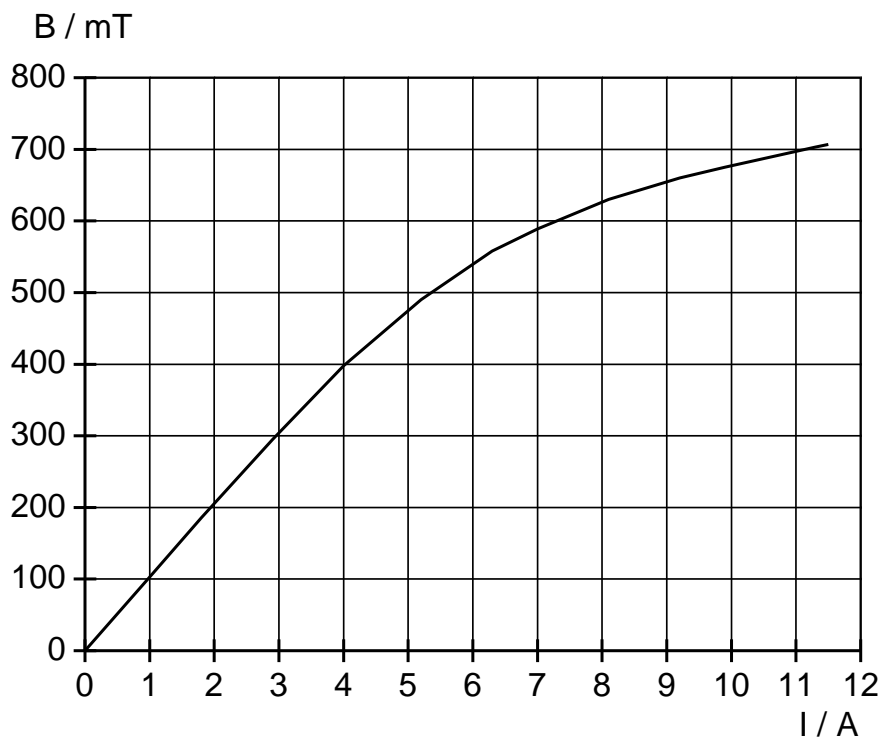
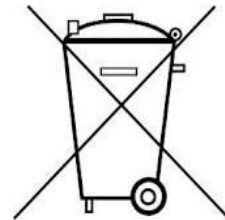


Fig. 3 Calibration curve for electromagnets when coils are connected with opposing polarity. Width of air gap 10 mm.

