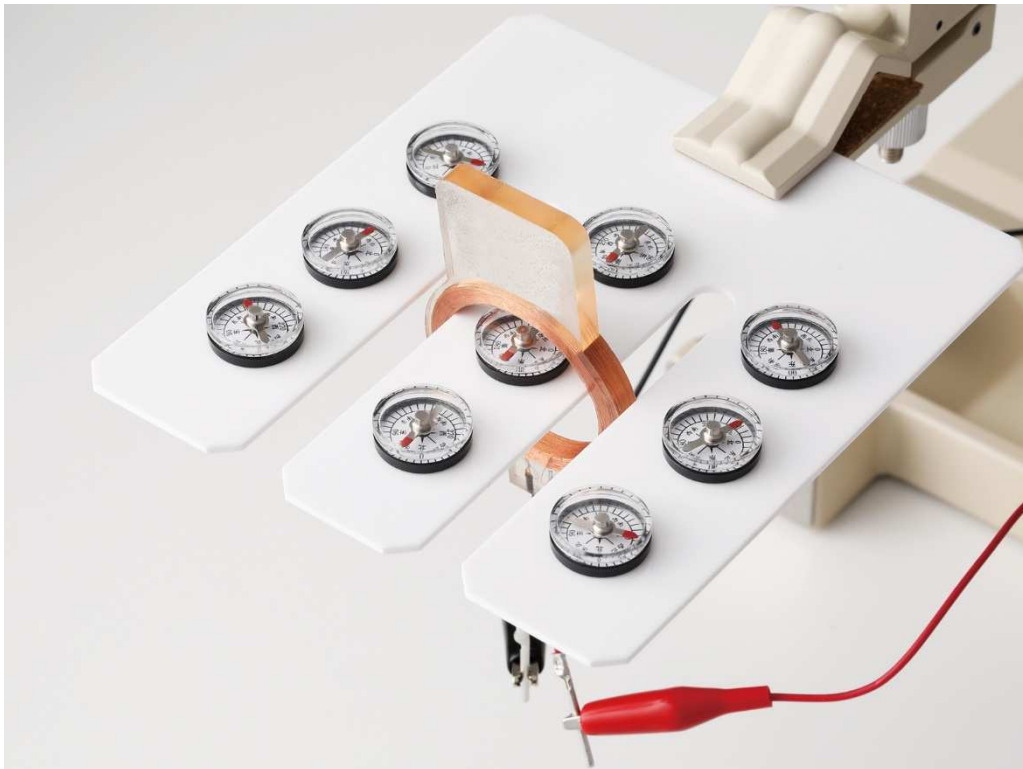


Ampere's Law with Molded Flat Coil

Cat. No. B10-4712-W0



December 2023

Introduction

Product's Feature

[Product Description]

This hybrid product consists of a Flat Coil Molded in Plastic, a straight-line shaped type of coil out of the pair of B10-4711-W0 (hereinafter referred to as coil), small compasses and an E-shaped plastic plate (hereinafter, referred to as plate). The coil is a 600 turns one molded into a flat shape with opaque curing resin, which prevents the coil from becoming unwound.

[Overall Advantages to Users]

Easy to carry out an experiment to demonstrate the interrelationship between electric current and magnetism, especially, with the help of the characteristic shape of the coil, such as its large diameter (outer dia. of 50 mm and inner of 40 mm), flatness, and lightness.

[To teachers]

Easy for teachers to plan their students' experiments to demonstrate Ampere's circuital law by predicting the lines of magnetic flux induced by current passing through the coil. In addition, it is possible to carry out other types of experiments like electromagnetic induction derived from Faraday's law thanks to the characteristic shape of the coil.

[To students]

Easy for students to predict the magnetic flux induced by the current passing through the coil thanks to the nine small compasses that can be arranged on the plate. The direction of the compass needle plotting indicates the direction of the magnetic flux lines.

[Keywords]

*Faraday's law *Electromagnetic induction *Induced electromotive force
 *Mutual induction *Ampere's law * Lorentz force *Motor effect
 *Maxwell's Equation

Contents

1 Flat Coil Molded in Plastic (Straight-line shaped type)

Size: Inner diameter: 40 mm, Outer diameter: 50 mm, Thickness: 7 mm

Coil: ϕ 0.2 mm copper wire, 600 turns

Resistance value: ca. 50 Ω

9 Small Compasses Size: ϕ 20 mm x 7 mm

1 E-shaped Plastic Plate Size: 150 x 135 x 2(t) mm

Precautions

- Do not directly plug the built-in lead(s) of the coil into an electric outlet because it can be damaged or lead to an electrical accident.
- Do not apply 12 V or more voltage to the coil because it can be damaged or lead to an electrical accident.
- Do not forcefully pull the lead(s). Although the coil and leads are integrally molded, the leads can get separated.
- Do not use the coil in a high-temperature environment that exceeds 70 degrees Celsius because the mold resin may deform and make the product unusable.
- The lead cannot be replaced. If the lead is cut off, you will need to purchase the whole product again.

How to use

[What to prepare included in the product:]

9 Small Compasses

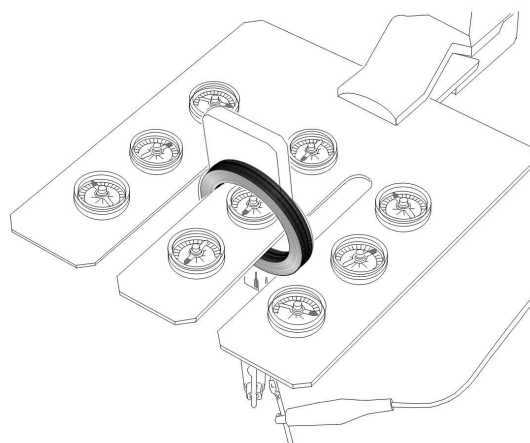
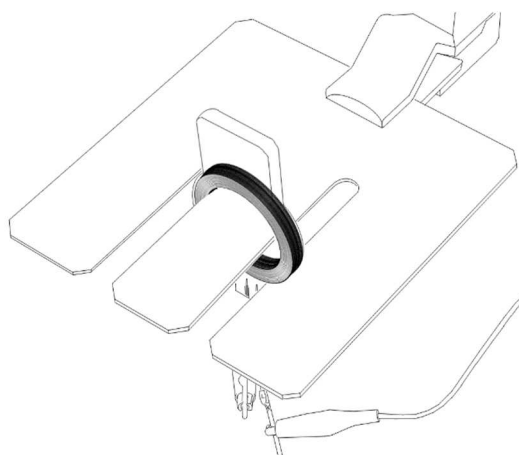
1 E-shaped Plastic Plate

[What to prepare by users:]

1 Support stand

1 DC Power supply (Narika's Genecon DUE or Genecon V3 can be used as well)

1 Pair of leads (red & black) with clips



[How to use:]

1. Clamp the E-shaped plate to the rod of a support stand.
2. Slide Flat Coil Molded in Plastic in the middle of the three forked parts of the plate until reaching the halfway point, while keeping the flange of the coil directed upward.
3. Connect the leads of the coil and terminals of a power supply using the lead wires with clips.
4. Place all the nine small compasses on the plate at even intervals in the form of a matrix of three rows by three columns, so that each of the three forked parts of the plate has three compasses in a row.
5. Turn on the power supply and observe the overall direction of the magnetic field lines that is indicated by the direction of the compass needles on the plate.

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