

ELECTROMAGNETIC INDUCTION APPARATUS

Cat: EM1740-001 complete with magnet

DESCRIPTION:

A metal conductor is mounted between bearings so that it can be rotated like a single blade of a paddle-wheel. A long slim cylindrical permanent magnet is slid through the bore of one bearing so it is supported horizontally. The length of the magnet lies parallel to the conductor and the tip of the magnet is about half way along the length of the conductor.

When the conductor is rotated, it is obvious that it would cut through all the lines of force that we imagine 'mushroom' out from the end of the magnet. Each bearing has a metal contact rubbing so that any voltage or current produced in the rotating conductor can be detected by a meter connected to the bearings. The device is to prove the following:

- That a voltage is produced when a conductor cuts magnetic lines of force.
- That the voltage is present while the conductor is cutting through the magnetic field.
- The voltage generated is proportional to the speed of rotation.
- A simple DC generator can be made that does not require a commutator.
- Examine the principles of Faraday's generator.

EM1740-001 electromagnetic induction



Phys size: 300x100x80mm LxWxH Wt: 1.8 kg (with magnet)

NOTE:

The output voltage of the single turn generator is very small 1 millivolt or so. To increase the output voltage so that a multimeter or a student bench meter can be used, use the IEC low impedance, high gain DC amplifier.
Cat: LB0071-001.

**SOME INTRIGUING QUESTIONS: Do you understand magnetic fields ?**

1) Position the magnet and rotate the conductor like normal. Establish the typical voltage output obtained at an average rotational speed.

Now, leave the conductor stationary and do not touch the handle. Spin the magnet inside the bearing by holding the overhanging end of the magnet with the finger tips. This is the opposite action to turning the conductor with the handle.

Observe the output voltage. What did you discover ? Try to explain.

2) Slide the magnet all the way into the conductor loop so that its end rests against the boss of the conductor where it passes through its bearing to the handle. Using a piece of 'blue tak' or similar, stick the end face of the magnet to the face of the boss so that both the conductor and the magnet rotate together. Use the handle to rotate both.

Observe the output voltage. What did you discover ? Try to explain.

NOTE: If you find that the results are baffling and cannot be explained, please phone or fax Industrial Equipment & Control Pty. Ltd. to discover the solutions to these problems.

Designed and manufactured in Australia