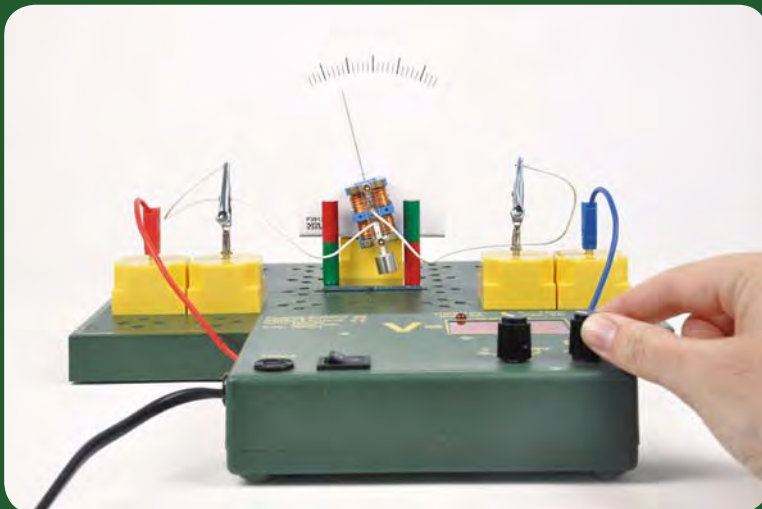


Student Experiments

Manual

ELECTRODYNAMICS

P9160-4T



INDEX

1. MAGNETIC FIELD OF A COIL

- EMS 1.1 The magnetic field and its field lines around a powered coil.
- EMS 1.2 The influence of the coil current on the direction of the magnetic field
- EMS 1.3 Relation between amperage and the tangent of the deflection angle

2. THE MAGNETIC FIELD OF THE EARTH

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3. KINETIC ENERGY FROM ELECTRIC ENERGY

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- EMS 3.2 Current flow and deflection of a current-carrying conductor in a magnetic field ("right-hand rule")
- EMS 3.3 Coil in a magnetic field (rotating-coil device)

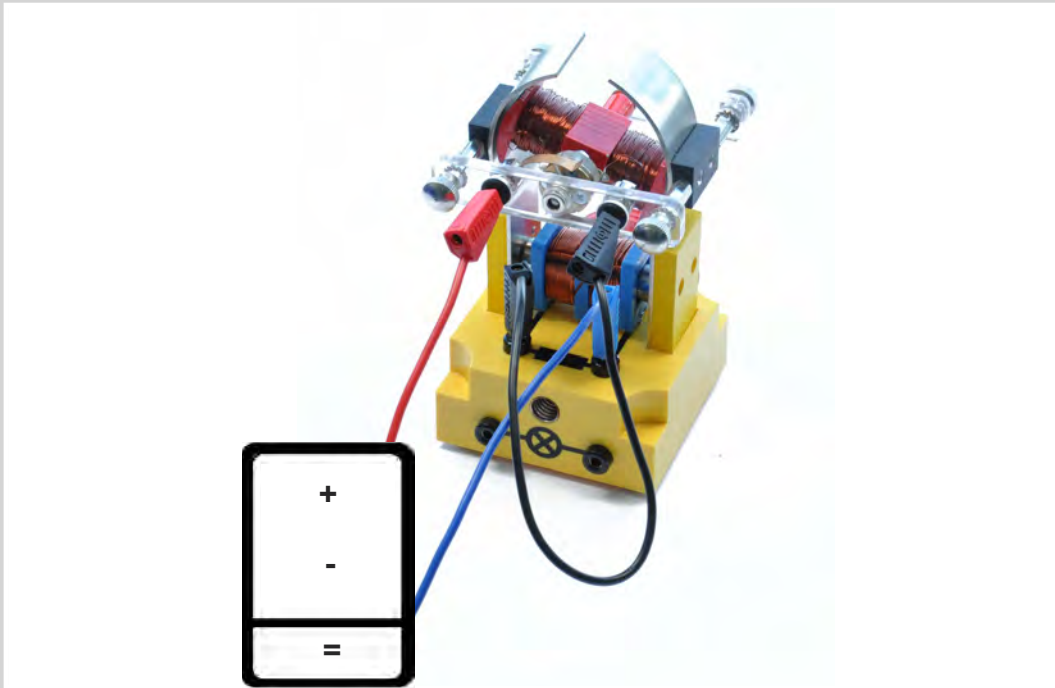
4. MOTOR/GENERATOR (COMPACT MODEL)

- EMS 4.1 Simple DC motor
- EMS 4.2 Series motor
- EMS 4.3 Shunt-wound motor
- EMS 4.4 DC generator - external pole generator

Required Kit:

P9901-4D Electricity 1

P9902-5T Electrodynamics

**Material:**

1x Connection lead, 25 cm, black

1x Connection lead, 50 cm, red

1x Connecting lead, 50 cm, blue

1x Motor/generator model

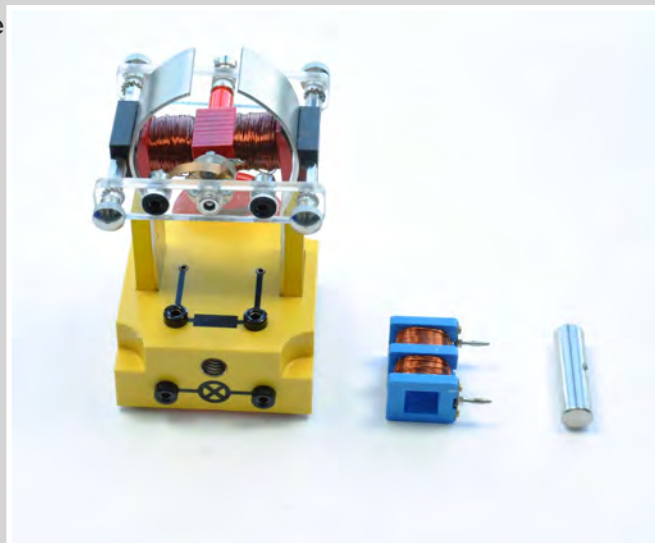
1x Moving coil with hole, blue

1x Iron core solid

Additionally required:

1x Power source

1x Meter



Experimental target:

Understanding of the function of a series motor.

Setup:

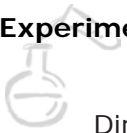
The iron core solid is put in the moving coil with hole. This moving coil with hole is inserted in the bushes "B". (The rotor has to stand horizontal to insert the moving coil). The bushes "A2/S2" (or "A2/S1" for other direction of rotation) are connected by means of a black connecting lead.

A red connecting lead is plugged in the bush "A1"

A blue connecting lead is plugged in the bush "S1" (or "S2" for other direction of rotation)

The commutator can be rotated a little by means of loosen the tiny screw in the ring. The motor is running well when the interruption points of the commutator stand vertical to the anchor. The two straps to the crank should be removed, to facilitate the rotation of the motor.

Experiment:



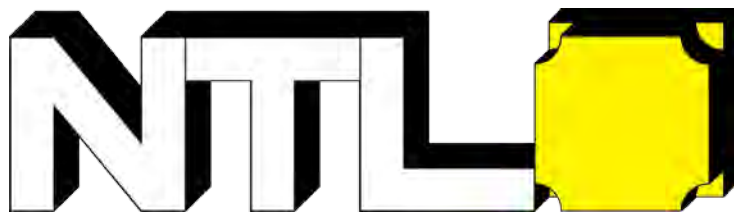
Direct current is applied on the red and blue connecting lead and the rotation of the rotator is investigated. If required fire up the anchor.

The drive belt can be attached at the crank again to load up the motor a little more.



Note:

The series motor (rotor- and field winding are connected in series) can be used in contrast to the simple direct current motor also with alternative current. The direction of the current changes in the rotor- and field winding at the same time. To start up the motor with alternating current a higher voltage is required because the AC resistance of the coil is larger than the DC resistance.



Student Experiments

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