TYPE J2409 , J2410

PRIMARY AND SECONDARY COLLS

OPERERATION INSTRUCTIONS

I. Application

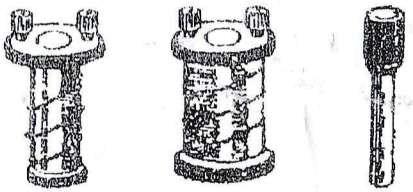
Type J2410 primary and secondary coils is the instrument for studying electromagnetic induction phenomenon.It works cooperating with bar magnet, ampere meter, slip resistance, etc., for demonstrating teaching experiments.

1. Study electromagnetic induction.
2. Testify Lenz Law.
3. Study magnetic induction phenomenon.

II. Structure

This instrument consists of three parts: primary coil A, secondary coil B and soft iron core C, as drawing 1.

Primary coil A and secondary coil B are both made of hollow bakelite skeletons winding with varnished wire. The primary one is smaller than the secondary one and its winding varnished wire is thicker and number of turns less. Three circles of plastic wire outside the coils indicate the winding direction of coils. Both ends of the coils have fasteners.



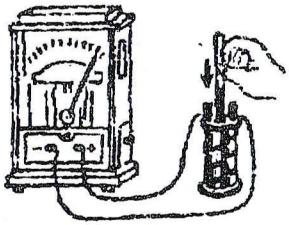
A B C

Drawing 1

III Use method

1.Study electromagnetic induction phenomenon: use wire to join the two ends of secondary coil B with the two fasteners of amperemeter (as drawing 2)

According to drawing 2,when inserting rapidly a bar magnet end into (or pulling out) secondary coil, the



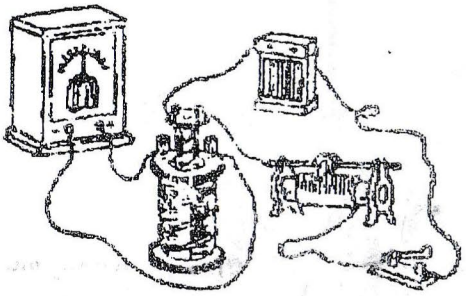
Drawing 2

arrow of amperemeter deflects, indicating the secondary coil has inducing current at that time, this is electromagnetic induction phenomenon.

On the contrary, if keeping the magnet unmoved, the movement of secondary coil will create the same phenomenon.

2. Testify Lenz Law

(1) According to the process of drawing 2: watch the current direction changes indicated by the amperemeter when the magnet is inserted in or pulled out and the polarity changing.



Drawing 3

(2) Join the primary coil with 3-4V DC power, and join into the circuit the series single switch and 10Ω slip resistance as drawing.

3. Use primary coil to replace magnet for the above experiment, the same phenomenon will appear. Change the input current direction of primary coil, the inducing current direction of secondary coil will change accordingly.

(3) Installing as (2), first insert primary coil into secondary one, then energize the primary coil. While the switch is just connected or cut off, the magnetic flux passing the secondary one will change, now inducing current results in while the current directions are reverse.

Change the current direction of primary coil to repeat the experiment, then the inducing current direction of secondary coil will change accordingly.

(4) Installing as (2), insert primary coil in the secondary and

connect circuit, then change rapidly the current intensity passing primary coil with slip resistance (strengthen or weaken), the secondary coil will result in inducing current with its direction same as (3).

From the above experiment result, we may make analysis then testify Lenz Law.

3. Study magnetic induction phenomenon:

Put the primary coil of the above 2(2) installment in the secondary one until it is unmoved. The secondary coil hasn't inducing current. Now insert soft iron core C in or pull out the center hole of the primary one. The soft iron core is magnetized and magnetic field stronger or weaker. Changing magnetic flux of secondary coil will also result in inducing current . This experiment may demonstrate magnetic induction and electromagnetic induction phenomenon.

If replacing soft iron core to insert into the center hole of primary coil to demonstrate the experiments of (2), the effect of strengthening inducing current of secondary coil will be more obviously.

Ⅳ. Maintain of instrument

1. The energizing current can not be too big because of the very small DC resistance of primary coil (about 0.5Ω) and energizing time can not be too long. The current voltage can not exceed 4V.

2. Pay attention to protect bakelite skeleton from damping or falling down to the ground.

3. Place the instrument in clear, dry, air and without corrosive air place.