

ABSTARCT

A prototype of a laboratory-scale metal detector has been made using the mutual inductance work. Mutual inductance occurs because of changes in current to time in the transmitter coil causing a magnetic field that changes, causing an electric force of motion (ggl) on the receiver coil. Coils are made in the form of solenoids using wire with a diameter of 0.5 mm, the number and length of windings are 400 and 200 mm, respectively. Overall, the average inductance value in the coil system is 607.4 μH . Transmitter coil input of 20 Vpp with a test distance of 15 cm. The working frequency of the coil system is 6600 kHz. This system is also able to distinguish test objects, namely iron plates, aluminum plates, zinc plates with a size of 3x3x0.02 cm, 5x5x0.02 cm, 11x11x0.02 cm and iron squares and aluminum squares with a size of 5x5x3 cm. This coil system is also able to distinguish the size of coil objects.

Keywords: *Prototype, Magnetic Field, Mutual Inductance, Metal Sensor, Coil.*