

ABSTRACT

A major problem for common conventional motors is the presence of the brushes, which limit the motor life to a few thousand hours and create friction and noise. Brushless motors eliminate these disadvantages but in most cases they are more expensive and too complicated.

In this scientific research a new simple inexpensive brushless DC motor using a magnetic proximity sensor (reed switch) was invented. Two different motors, regular and a simplified version, were built and tested many times.

The manipulated variable in the experiments with the new motor was voltage. The controlled variables were the number of magnets, the reed switch position, and the number of weights in torque testing. The responding variables were the speed, measured in revolutions per minute; the relative power, measured as an angle on the torque testing device; and an average current, measured in milliamps.

The experiments were performed separately for two and four magnets on a rotor, and the motor with four magnets proved to be the best. The results also clearly showed that the new invented reed switch based brushless DC motor was very reliable, stable, and powerful enough to be favorably compared to existing conventional motors.

Many aspects of this project can be improved in future experiments. With proper modification a reed switch based brushless DC motor can be used for almost any application where high stability, reliability, and efficiency are required.