

ABSTRACT

In the first year research a new simple inexpensive brushless DC motor based on a reed switch was invented, built, and tested. It was further improved in the second year development. The third year study was devoted to the development and comparison of eight different types of brushless motors:

- The Original Reed Switch Based Brushless Motor
- Double Reed Switch Motor Based On Push-Pull Operation
- SCR Controlled Brushless Motor
- Transistor Controlled Brushless Motor
- Optocoupler Based Brushless Motor
- Brushless Motor With Optical Control
- Hall Effect Position Sensor Based Brushless Motor
- Brushless Motor Based On Hall Effect IC

All of these motors shared the same design and technology to get a reliable and accurate comparison. The motors were tested and compared in different categories, such as speed under different loads, torque under different voltages, maximum load, efficiency, reliability, stability, cost, and complexity. According to experimental data, different motors showed best results in various categories.

The original reed switch based brushless motor was widely used as an educational kit to demonstrate principles of electricity and magnetism. Other motors developed this year may serve the same purpose to help explain the basics of electronics. After proper modification these brushless DC motors can be used for almost any application where high stability, reliability, and efficiency are required.