

ABSTRACT

The development of electric car technology has become a major focus in an effort to reduce dependence on fossil fuels and address the problem of greenhouse gas emissions that have become a global issue. One of the main problems is the complexity of motor control. BLDC motor control requires sophisticated hardware and software to regulate current and voltage precisely, which can increase costs and require in-depth technical knowledge. This study aims to analyze the performance of a 5 kW BLDC motor implemented in the Fin Komodo Telkom University Surabaya car, by considering performance efficiency through controller settings and load variations. Specifically, this study focuses on several aspects, the first is, Testing the performance of the BLDC motor on the Fin Komodo Telkom University Surabaya Car. Second, Testing the efficiency level of the Fin Komodo Telkom University Surabaya Car with variations in controller settings, including its effect on motor performance and energy consumption. Third, Testing the efficiency level of the vehicle with variations in the load received. Fourth, Testing battery consumption on the fin Komodo with variations in the load carried out. It is hoped that this research can encourage innovation in the use of renewable energy for more sustainable transportation, as well as provide a strong basis with data that has been obtained with three variations of controller settings and loads, with the results of the second variation of controller settings showing the most optimal with the highest vehicle efficiency of 83.33% and the furthest distance traveled of 39.9 km.

Keywords: *BLDC Motors, Controllers, Electric Cars, Load Variations, and Performance Efficiency.*