

ABSTRAK

PERANCANGAN SISTEM *MONITORING DISCHARGE* AKUMULATOR MENGUNAKAN ARDUINO DAN SENSOR INA219

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Perancangan sistem *monitoring discharge* akumulator menggunakan Arduino dan sensor ina219 telah direalisasikan. Penelitian ini bertujuan untuk merancang dan membangun sistem *monitoring discharge* penurunan tegangan aki berbasis Arduino dan sensor INA219 serta menganalisis karakteristik penurunannya. Sistem ini digunakan untuk mengukur tegangan, arus, dan daya secara *real-time* dengan pencatatan data setiap 2 menit ke dalam SD card. Pengujian dilakukan sebanyak tiga kali menggunakan beban motor DC 12 V hingga aki habis, dengan tegangan awal masing-masing 12,83 V, 13,14 V, dan 13,5 V serta durasi 312 menit, 330 menit, dan 318 menit. Penurunan tegangan drastis terjadi pada menit ke-240 sebesar 0,92 V pada pengujian pertama dan menit ke-212 sebesar 4,78 V pada pengujian kedua, sedangkan pengujian ketiga menunjukkan penurunan yang lebih stabil, serta ditemukan titik kritis pada kisaran 8–9 V sebagai batas kondisi aki mendekati habis. Selain itu, diperoleh hubungan antara tegangan, arus, dan daya yang saling berbanding lurus, dimana penurunan tegangan diikuti oleh penurunan arus dan daya. Berdasarkan hasil tersebut, sistem yang dirancang mampu memonitor dan merepresentasikan kondisi nyata aki selama proses *discharge* secara efektif.

Kata kunci: Akumulator, *Monitoring discharge*, Arduino, Sensor INA219, Tegangan, Arus, Daya.

ABSTRACT

DESIGN OF ACCUMULATOR DISCHARGE MONITORING SYSTEM USING ARDUINO AND INA219 SENSOR

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The design of a battery discharge monitoring system using Arduino and the INA219 sensor has been successfully implemented. This study aims to develop a monitoring system for battery voltage drop during the discharge process and to analyze its characteristics. The system is capable of measuring voltage, current, and power in real-time, with data recorded every 2 minutes and stored on an SD card. The testing was conducted through three discharge cycles using a 12 V DC motor as the load until the battery was fully depleted. The initial voltages were 12.83 V, 13.14 V, and 13.5 V, with operating durations of 312 minutes, 330 minutes, and 318 minutes, respectively. Significant voltage drops occurred at the 240th minute (0.92 V) in the first test and at the 212th minute (4.78 V) in the second test, while the third test showed a more stable decline. A critical voltage range of 8–9 V was also identified as the threshold indicating that the battery was approaching depletion. In addition, a direct relationship between voltage, current, and power was observed, where a decrease in voltage is followed by decreases in current and power. Based on these results, the developed system is capable of effectively monitoring and representing the actual condition of the battery during the discharge process.

Key words: Accumulator, Discharge Monitoring, Arduino, INA219 Sensor, Voltage, Current, Power