

ABSTRAK
KAPASITAS BATERAI UNTUK SUMBER CADANGAN PADA
PANEL KONTROL

(2026 : xv + 55 halaman + Daftar Pustaka + Lampiran)

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Penelitian ini bertujuan untuk mengevaluasi kapasitas baterai sebagai sumber daya cadangan pada panel kontrol 125 VDC di PT. Pupuk Sriwidjaja (PUSRI) Palembang. Analisis dilakukan terhadap daya beban sistem, pengaruh umur baterai dan temperatur terhadap kapasitas aktual baterai, estimasi waktu backup, serta kelayakan baterai sebagai sumber daya cadangan. Metode yang digunakan meliputi studi literatur, observasi lapangan, wawancara, dan analisis data teknis. Data yang dianalisis berupa baterai VRLA AGM berkapasitas nominal 800 Ah pada sistem 125 VDC dengan arus beban 21 A dan tegangan beban 136 VDC. Hasil perhitungan menunjukkan bahwa daya beban sistem sebesar 2.856 Watt. Pengaruh umur operasi baterai selama 12 tahun menyebabkan kapasitas aktual menurun menjadi 680 Ah, sedangkan pengaruh temperatur ruang baterai sebesar 21,9°C menyebabkan kapasitas efektif menurun menjadi 667,35 Ah. Berdasarkan kapasitas aktual tersebut, diperoleh estimasi waktu backup selama 31,77 jam. Selain itu, hasil perhitungan menunjukkan nilai Depth of Discharge (DoD) sebesar 2,625% dan State of Charge (SOC) sebesar 97,375%, yang menunjukkan bahwa baterai masih memiliki kapasitas cadangan yang sangat besar. Berdasarkan hasil evaluasi yang dilakukan, baterai masih layak digunakan sebagai sumber daya cadangan untuk mendukung keandalan sistem kontrol dan proteksi pada panel kontrol 125 VDC di PT. Pupuk Sriwidjaja (PUSRI) Palembang.

Kata Kunci: Baterai, Kapasitas, Temperatur, Backup, Kelayakan.

ABSTRACT

BATTERY CAPACITY FOR BACKUP SOURCE ON THE CONTROL PANEL

(2026 : xv + 55 Pages + Bibliography + Attachment)

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This study aims to evaluate the battery capacity as a backup power source for the 125 VDC control panel at PT. Pupuk Sriwidjaja (PUSRI) Palembang. The analysis focuses on the system load power, the effects of battery aging and temperature on the actual battery capacity, the estimated backup time, and the feasibility of the battery as a backup power source. The research methods employed include literature review, field observation, interviews, and technical data analysis. The data analyzed were obtained from a VRLA AGM battery with a nominal capacity of 800 Ah operating in a 125 VDC system with a load current of 21 A and a load voltage of 136 VDC. The calculation results indicate that the system load power is 2,856 Watts. The battery's 12 years of operation reduced its actual capacity to 680 Ah, while the battery room temperature of 21.9°C further reduced the effective capacity to 667.35 Ah. Based on the actual capacity, the estimated backup time was calculated to be 31.77 hours. Furthermore, the calculated Depth of Discharge (DoD) and State of Charge (SoC) values were 2.625% and 97.375%, respectively, indicating that the battery still retains a substantial reserve capacity. Based on the evaluation results, the battery is considered suitable for continued use as a backup power source to support the reliability of the control and protection systems of the 125 VDC control panel at PT. Pupuk Sriwidjaja (PUSRI) Palembang.

Keywords: Battery, Capacity, Temperature, Backup, Condition.