

ABSTRAK

ANALISA EFISIENSI MOTOR INDUKSI 3 FASA GB-601-A SEBAGAI PENGGERAK BLOWER DI PT PUPUK SRIWIDJAJA PALEMBANG

(2025: xiv + 75 Halaman + Daftar Gambar + Daftar Tabel + Lampiran)

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Energi listrik berperan penting dalam sistem produksi industri, terutama dalam pengoperasian motor listrik sebagai penggerak peralatan mekanis seperti blower pada cooling tower. Di PT Pupuk Sriwidjaja Palembang (PUSRI), digunakan motor induksi tiga fasa tipe GB-601-A untuk menggerakkan blower pada unit cooling tower pabrik urea III. Penelitian ini bertujuan menganalisis efisiensi aktual motor berdasarkan data pengukuran langsung selama lima hari. Parameter yang dicatat meliputi tegangan antar fasa, arus beban, faktor daya, kecepatan putaran, dan resistansi stator. Dari hasil perhitungan, rata-rata daya masukan motor berkisar antara 139,7–148,7 kW dan daya keluarannya antara 130,9–140,5 kW. Rugi-rugi daya terdiri dari rugi tembaga stator, rotor, serta rugi mekanis. Efisiensi aktual motor berada pada kisaran 94,45%–94,62%, mendekati efisiensi nominal 95%. Hal ini menunjukkan bahwa motor masih bekerja secara efisien dan layak dioperasikan tanpa perombakan besar.

Kata Kunci: Motor Induksi 3 Fasa, Daya *Input*, Daya *Ouput*, Efisiensi, Rugi-Rugi Daya.

ABSTRACT

EFFICIENCY ANALYSIS OF 3-PHASE INDUCTION MOTOR GB-601-A AS A BLOWER DRIVE AT PT PUPUK SRIWIDJAJA PALEMBANG

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Electrical energy plays a vital role in modern industrial production systems, particularly in operating electric motors that drive mechanical equipment such as blowers in cooling towers. At PT Pupuk Sriwidjaja Palembang (PUSRI), a three-phase induction motor type GB-601-A is used to drive the blower in the urea III plant's cooling tower unit. This study aims to analyze the actual efficiency of the motor based on five days of direct field measurements. Recorded parameters include line-to-line voltage, load current, power factor, rotor speed, and stator resistance. Calculations show that the motor's input power ranges from 139.7 to 148.7 kW, while the output (shaft) power ranges from 130.9 to 140.5 kW. Power losses consist of stator copper loss, rotor copper loss, and mechanical loss. The actual efficiency ranges between 94.45% and 94.62%, which is close to the nominal efficiency of 95%. These results indicate that the motor still operates efficiently and does not require major modifications.

Keywords: *Three-Phase Induction Motor, Input Power, Output Power, Efficiency, Power Losses.*