

ABSTRAK

ANALISIS WAKTU TRANSISI SISTEM ATS-AMF 1.5 KVA BERDASARKAN MEKANISME KONTROL MANUAL DAN OTOMATIS

(2026: xv + 66 Halaman + Daftar Gambar + Daftar Tabel + Lampiran)

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Energi listrik merupakan kebutuhan utama sehingga gangguan pada sumber listrik dapat menghambat operasional peralatan. Sistem *Automatic Transfer Switch–Automatic Main Failure* (ATS-AMF) digunakan untuk menjaga kontinuitas suplai listrik melalui perpindahan sumber dari PLN ke generator set (genset) secara manual maupun otomatis. Penelitian ini bertujuan menganalisis waktu transisi sistem ATS-AMF 1,5 kVA berdasarkan mekanisme kontrol manual dan otomatis serta mengidentifikasi faktor-faktor yang mempengaruhinya. Pengujian dilakukan sebanyak lima kali pada setiap kondisi perpindahan sumber menggunakan *stopwatch* dan sensor PZEM-004T berbasis ESP32. Hasil penelitian menunjukkan rata-rata waktu transisi otomatis dari PLN ke genset sebesar 10,3 detik dan dari genset ke PLN sebesar 9,12 detik. Pada mekanisme manual, rata-rata waktu transisi masing-masing sebesar 14,66 detik dan 11,6 detik. Sistem otomatis menghasilkan waktu transisi yang lebih cepat dan konsisten dibandingkan sistem manual. Faktor yang mempengaruhi waktu transisi meliputi *starting* genset, stabilisasi tegangan, perpindahan kontaktor, dan respons operator.

Kata kunci: ATS - AMF, Waktu Transisi, Genset.

ABSTRACT

TRANSITION TIME ANALYSIS OF ATS-AMF SYSTEM 1.5 KVA BASED ON MANUAL AND AUTOMATIC CONTROL MECHANISMS

(2026: xv + 66 Page + List of Figures + List of Tables + List of Appendix)

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Electrical energy is an essential requirement in daily life; therefore, interruptions in the power supply can significantly affect equipment operation. The Automatic Transfer Switch–Automatic Main Failure (ATS-AMF) system is used to maintain power supply continuity by transferring the source from the utility grid (PLN) to a generator set (genset) either manually or automatically. This study aims to analyze the transition time of a 1.5 kVA ATS-AMF system based on manual and automatic control mechanisms and to identify the factors affecting the transition process. Testing was conducted five times for each transfer condition using a stopwatch and a PZEM-004T sensor integrated with an ESP32 microcontroller. The results show that the average automatic transition time from PLN to the genset was 10.3 seconds, while the transition from the genset to PLN was 9.12 seconds. In manual mode, the average transition times were 14.66 seconds and 11.6 seconds, respectively. The automatic system provided faster and more consistent transition times than the manual system. Factors affecting transition time include genset starting time, voltage stabilization time, contactor switching time, and operator response time.

Keywords: *ATS-AMF, Transition Time, Genset.*