

ABSTRAK

PERBANDINGAN KARAKTERISTIK *THERMAL OVERLOAD RELAY* PADA RANCANG BANGUN ALAT PRAKTIKUM PENGAMAN PERALATAN DAN MANUSIA

(2025 : xvii + 77 halaman + gambar + tabel + lampiran)

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Thermal Overload Relay (TOR) merupakan salah satu komponen proteksi penting dalam sistem kelistrikan, khususnya pada motor listrik, yang berfungsi untuk memutus arus secara otomatis saat terjadi beban lebih. Penelitian ini bertujuan untuk membandingkan karakteristik kerja TOR dari tiga merek berbeda melalui rancang bangun alat praktikum pengaman peralatan dan manusia. Pengujian dilakukan dalam dua kondisi, yaitu saat TOR dalam keadaan dingin dan panas, dengan variasi arus gangguan mulai dari 1,6 A dan menggunakan motor pompa sebagai beban. Hasil pengujian menunjukkan bahwa waktu trip TOR tidak bersifat linier terhadap besarnya arus gangguan serta terdapat perbedaan signifikan antara kondisi dingin dan panas. Selain itu, semakin besar arus gangguan yang diberikan, maka semakin cepat TOR melakukan pemutusan arus. Perbedaan waktu tripping antar merek juga menunjukkan bahwa karakteristik kerja TOR sangat dipengaruhi oleh kualitas dan sensitivitas komponen internal. Dengan adanya alat praktikum ini, diharapkan mahasiswa dapat memahami lebih dalam prinsip kerja dan karakteristik proteksi dari TOR dalam kondisi nyata.

Kata Kunci: *Thermal, Overload, Relay*, Karakteristik, Trip.

ABSTRACT

COMPARISON OF THERMAL OVERLOAD RELAY CHARACTERISTICS IN THE DESIGN OF A PRACTICAL TOOL FOR EQUIPMENT AND HUMAN SAFETY

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Thermal Overload Relay (TOR) is one of the essential protective components in electrical systems, particularly in electric motors, functioning to automatically disconnect the current during overload conditions. This study aims to compare the operating characteristics of TORs from three different brands through the design and development of a practical tool for equipment and human safety. The testing was conducted under two conditions: when the TOR was in a cold state and in a heated state, using varying fault currents starting from 1.6 A, with a water pump motor as the load. The test results show that the TOR tripping time is not linear with the magnitude of the fault current and that there is a significant difference between the cold and hot conditions. Additionally, the greater the fault current applied, the faster the TOR trips. Differences in tripping times between brands also indicate that the performance characteristics of TORs are greatly influenced by the quality and sensitivity of their internal components. The developed practical tool is expected to help students gain a deeper understanding of the working principles and protection characteristics of TORs under real-world conditions.

Keywords: Thermal, Overload, Relay, Tripping, Characteristics.