

ABSTRAK

Tegar Prakoso, Analisis Tahanan Isolasi Current Tranformator ULTG Madiun. Skripsi, Program Studi Teknik Elektro, Fakultas Teknik, Universitas PGRI Madiun. Pembimbing (1) Irna Tri Yuniahastuti S.Pd., M.T. (2) Bayu Fandidarma, S.T., M.T.

Current Transformator (CT) merupakan komponen penting di gardu induk yang berfungsi mengukur arus dan mendukung sistem proteksi. Kinerja CT sangat dipengaruhi oleh kualitas isolasinya, yang dapat menurun karena faktor lingkungan seperti kelembaban, suhu, dan usia peralatan. Penelitian ini bertujuan untuk mengetahui kondisi tahanan isolasi CT 70 kV di Gardu Induk Magetan, Mranggen, dan Caruban. Pengujian dilakukan menggunakan alat Insulation Tester (Megger) dengan tegangan 5000 V untuk sisi primer dan 500 V untuk sisi sekunder. Hasil pengujian dianalisis menggunakan standar IEC 60044-1 dan VDE Catalogue 228/4 yang menetapkan batas minimal tahanan isolasi sebesar 70 M Ω . Hasil penelitian menunjukkan variasi nilai tahanan isolasi pada setiap gardu dan titik ukur. Nilai tertinggi terdapat di Gardu Induk Mranggen sebesar 1091 M Ω (primer-ground fasa S), sedangkan nilai terendah sebesar 57,8 M Ω (primer-sekunder 1 fasa S). Semua pengujian pada sisi sekunder menunjukkan nilai maksimum alat, yaitu 1 G Ω .

Kata kunci: Current Transformator, tahanan isolasi, IEC 60044-1, VDE 228/4

ABSTRACT

Tegar Prakoso, Analysis of Current Transformer Isolation Resistance at ULTG Madiun. Undergraduate Thesis, Electrical Engineering Study Program, Faculty of Engineering, Universitas PGRI Madiun. Advisors: (1) Irna Tri Yuniahastuti, S.Pd., M.T., (2) Bayu Fandidarma, S.T., M.T.

Current Transformer (CT) are critical components in substations, serving to measure current and support protection systems. The performance of CT is heavily influenced by the quality of their insulation, which can degrade due to environmental factors such as humidity, temperature, and equipment aging. This study aims to evaluate the insulation resistance condition of 70 kV CTs at the Magetan, Mranggen, and Caruban Substations. Testing was conducted using an Insulation Tester (Megger) with a 5000 V applied to the primary side and 500 V to the secondary side. The results were analyzed based on IEC 60044-1 and VDE Catalogue 228/4 standards, which set a minimum insulation resistance threshold of 70 M Ω . The findings revealed variations in insulation resistance values across different substations and measurement points. The highest recorded value was 1091 M Ω (primary-ground, phase S) at the Mranggen Substation, while the lowest was 57.8 M Ω (primary-secondary 1, phase S). All secondary-side measurements showed the instrument's maximum reading of 1 G Ω , confirming compliance with insulation standards. This research provides insights into the insulation condition of CTs in different substations, highlighting potential areas for maintenance and further investigation.

Keywords: Current Transformer, insulation resistance, IEC 60044-1, VDE 228/4