

**PROTEKSI TEGANGAN SENTUH LISTRIK PADA MANUSIA MEGGUNAKAN GROUNDING  
DAN RCBO ( RESIDUAL CURRENT CIRCUIT BREAKER WITH OVERCURRENT  
PROTECTION )**

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**ABSTRAK**

Keamanan listrik merupakan aspek penting dalam instalasi kelistrikan untuk mencegah bahaya yang disebabkan oleh arus bocor dan tegangan sentuh. Penelitian ini bertujuan untuk menganalisis efektivitas penggunaan RCBO (*Residual Current Circuit Breaker with Overcurrent Protection*) dan grounding dalam melindungi manusia dari bahaya listrik, terutama dalam pengoperasian pompa air di lantai 1 dan 3 Laboratorium Teknik, Universitas Muhammadiyah Makassar. Pengujian dilakukan menggunakan elektroda batang tunggal, serta RCBO dengan arus nominal 6 A dan sensitivitas arus bocor 30 mA. Metode penelitian melibatkan perancangan sistem proteksi, pengujian arus bocor, dan evaluasi resistansi grounding terhadap kedalaman elektroda. Hasil penelitian menunjukkan bahwa RCBO dengan sensitivitas 30 mA mampu mendeteksi arus bocor secara andal dan memutus aliran listrik dalam waktu kurang dari 0,1 detik, sehingga melindungi pengguna dari bahaya sengatan listrik. Sementara itu, sistem grounding menunjukkan efisiensi yang meningkat seiring dengan kedalaman elektroda, di mana resistansi tanah yang lebih kecil memberikan perlindungan lebih baik terhadap kebocoran arus. Kombinasi RCBO dan grounding terbukti efektif dalam meningkatkan keselamatan listrik dan mengurangi risiko tegangan sentuh, sehingga direkomendasikan untuk diterapkan pada berbagai instalasi kelistrikan.

*Kata kunci, Tegangan Sentuh, Arus Bocor, Grounding, RCBO (Residual Current Circuit Breaker with Overcurrent Protection), Proteksi Listrik.*

***ELECTRICAL TOUCH VOLTAGE PROTECTION IN HUMANS USING GROUNDING AND RCBO (RESIDUAL CURRENT CIRCUIT BREAKER WITH OVERCURRENT PROTECTION)***

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**ABSTRACT**

*Electrical safety is an important aspect in electrical installations to prevent dangers caused by leakage currents and contact voltages. This research aims to analyze the effectiveness of using RCBO (Residual Current Circuit Breaker with Overcurrent Protection) and grounding in protecting humans from electrical hazards, especially in operating water pumps on the 1st and 3rd floors of the Engineering Laboratory, Muhammadiyah University of Makassar. Tests were carried out using a single rod electrode, as well as an RCBO with a nominal current of 6 A and a leakage current sensitivity of 30 mA. The research method involves designing a protection system, leakage current testing, and evaluating grounding resistance against electrode depth. The research results show that RCBO with a sensitivity of 30 mA is able to reliably detect leakage currents and cut off electricity in less than 0.1 seconds, thereby protecting users from the danger of electric shock. Meanwhile, the grounding system shows increasing efficiency with electrode depth, where smaller ground resistance provides better protection against current leakage. The combination of RCBO and grounding has proven to be effective in increasing electrical safety and reducing the risk of touch voltage, so it is recommended for application in various electrical installations.*

*Keywords, Touch Voltage, Leakage Current, Grounding, RCBO (Residual Current Circuit Breaker with Overcurrent Protection), Electrical Protection.*