# PERANCANGAN DAN ANALISA FILTER HARMONISA PASIF *SINGLE TUNED* DI RUANGAN LABORATORIUM *INTERFACE* GEDUNG ELEKTRO


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## ABSTRAK


Laboratorium *Interface* di Gedung Elektro Politeknik Negeri Bengkalis menggunakan banyak peralatan non-linier yang menghasilkan harmonisa, sehingga menurunkan kualitas daya listrik. Penelitian ini merancang filter harmonisa pasif jenis single tuned untuk mereduksi harmonisa arus. Proses dimulai dengan pengukuran THD arus dan tegangan menggunakan *Power Analyzer*. Setelah dilakukan perhitungan dan perancangan kapasitor 41 µF dan induktor 27 mH, filter dipasang secara paralel di sistem. Hasilnya, THD arus fasa I2 turun signifikan dari 65,7% menjadi 36,9%, sedangkan fasa I1 dan I3 mengalami penurunan lebih kecil. Sebaliknya, THD tegangan justru meningkat pada semua fasa, menunjukkan bahwa filter lebih efektif mereduksi harmonisa arus dibanding tegangan. Hal ini kemungkinan disebabkan oleh kualitas komponen atau desain filter. Kesimpulannya, filter pasif *single tuned* cukup efektif untuk perbaikan bentuk gelombang arus, namun perlu evaluasi lebih lanjut agar tidak menambah gangguan pada tegangan.



**Kata Kunci**: Filter harmonisa, *single tuned*, THD, Beban non-linier, kualitas daya

# *DESIGN AND ANALYSIS OF SINGLE TUNED PASSIVE HARMONIC FILTER IN THE INTERFACE LABORATORY ROOM OF THE ELECTRICAL BUILDING*


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## *ABSTRACT*


*The Interface Laboratory in the Electrical Engineering Building of the Bengkalis State Polytechnic uses numerous non-linear devices that generate harmonics, degrading power quality. This research designed a single-tuned passive harmonic filter to reduce current harmonics. The process began with measuring the current and voltage THD using a Power Analyzer. After calculating and designing a 41 µF capacitor and a 27 mH inductor, the filter was installed in parallel with the system. As a result, the current THD of phase I2 decreased significantly from 65.7% to 36.9%, while phases I1 and I3 experienced smaller decreases. Conversely, the voltage THD increased across all phases, indicating that the filter is more effective at reducing current harmonics than voltage. This is likely due to component quality or filter design. In conclusion, the single-tuned passive filter is quite effective for improving current waveforms, but further evaluation is needed to ensure it does not increase voltage disturbances.*



***Keywords****: Harmonic filter, single-tuned, THD, non-linear load, power quality.*