

Harmonics Induced By Triac-Based Soft Starting Of An Induction Motor In A Residential Air Conditioner

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Summary

This work is focusing on the frequency analysis of a window type residential AC unit line current under time-based soft-starting control strategy. The control strategy assumes that only source voltage and current measurements are available. The soft-starter is based on power electronic devices controlled through a firing signal generated by a programmed microcontroller during the first 500 ms. The frequency content shows the effect of the soft starter in exciting high frequency components of the line current. A Fast Fourier Transform as well as a body diagram analysis show that the high frequencies even or odd multiples of the fundamental line frequency are all excited by the soft-starter approach. Some these frequencies may harm the life cycle of the air-conditioner. The paper describes the experimental setup in details.

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