

ABSTRACT

Power electronic-based equipment is becoming a common necessity in life. Some of these devices require a controlled direct current to be more efficient, while the available source is alternating current, thus a controlled ac - dc converter is needed. One of the controlled ac - dc converter with high efficiency is the single phase full converter of controlled rectifier. This ac - dc converter contains a component semiconductor switches, such as thyristors, called non-linear loads. Non-linear load could generate harmonic in voltage and current which cause distorted wave be a non-sinusoidal form.

The high levels of harmonics in the electrical load or electrical power distribution system could make power quality system is getting worse. These are because the power system is getting lower, the voltage waveform is distorted, power losses in the system is increased, and more heat on the transformer. In the end, electrical consumable is inefficient. To resolve this, %THD (Total Harmonic Distortion) current and voltage generated by the ac - dc converter is made to meet IEEE 519-1992 Standard.

This study will carry out the implementation of passive filter LCL on single phase full converter of controlled rectifier with Resistor as much as 23 Ω . Before implementation of passive filter, maximum efficiency power of this controlled rectifier is 57,04%; and after the implementation of passive filter LCL, maximum efficiency power is decreasing to 54,6%. Next, the harmonics is measured with harmonic meters. The result is %THDv maximum 3,1% and %THDi maksimum 71,8%, before the implementation of passive filter LCL. And after the implementation of passive filter LCL, maximum %THDv is decreasing to 2,7% and maximum %THDi is also increasing to 96,5%. So, implementation of passive filter could generate %THDv that meets the allowable standards of voltage harmonics, which is below 3%. But, %THDi could not meet allowable standard of current harmonic, which is below 20%.

Keywords : *Passive Filters, Harmonic, Total Harmonic Distortion, IEEE 519-1992.*