ABSTRACT

Light Emitting Diode (LED) has been widely used in Indonesia for a lighting system. LED lamp has high energy efficiency and environmentally friendly. The use of LED lighting is also used in the field of automation, for example in the smart home automation. The ability LED lamps to dimmed provide power efficiency as well as being an attractive feature on a smart home automation. However, some references mentioned that some brands of LED lamps have high levels of harmonic current that higher than maximum limit of IEC 61000-3-2 Class C standard. These high harmonic currents will make distortion of the current signal, interference to other equipment and poor power quality of the system.

On this research harmonic filter will be implemented in LED lights which commercially available in Indonesia market. The research method consists of several stages, there are measurement, calculation, implementation, and analysis. Results indicate that current harmonic from LED lighting system exceeds the limit of IEC 61000-3-2 which is, 176.6% on units percentage of Total Harmonic Current (% THDi).Then the value of capacitors and inductors of the filter is calculated according to the cut-off frequency. Filters which implemented in this final project is a Low Pass Filter. The result of implementation and analysis will be compared with the differences between before and after implementation of harmonic filters.

The results of measurement harmonic after the implementation of the low pass filter shown that % THDi is decreasing from 176,6% to 25,3%. The measurement results also shown the increase of power factor from 0.56 to 0.97 and the real power from 18 watts to 21 watts.

***Keywords**: LED lamp, harmonics, low pass filter, %THDi, IEC 61000-3-2, Power Quality*