

## Abstract

Capacitor bank is a collection of power tools in the form of a capacitor that serves as a tool that can reduce or improve reactive power into the power grid. The load on the electricity network in general is an inductive load. If the average power factor ( $\cos \theta$ ) is less than 0.85, the State Electricity Company will provide the reactive power in KVAR fines usage charges on customers. An effort should be done to reduce the reactive power. An installation of bank capacitor is suitable to be implemented in an industry AC loads. It will reduce the reactive power and improve the power factor. In the case of 380 V, 50 Hz, 500 kW AC loads are improved the power factor from 0.7 to 0.93 using genetic algorithm, thus the AC loads current and reactive power will be decreased. It is suitable that the AC loads current is inversely proportional to the power factor, and the reactive power is proportional to the AC loads current.