DESIGN AND DEVELOPMENT OF CAPACITOR COMBINATION MODULE AS THREE PHASE MOTOR POWER FACTOR CORRECTION

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ABSTRACT

In many companies, inductive loads which generally have a low power factor, such as induction motors, are widely used. In this context, designing and analyzing capacitor combination modules to increase the power factor in three-phase motors becomes relevant. This research aims to see the impact of using a combination of capacitors on the power factor of a three-phase motor, identifying a comparison of the power factor of a three-phase motor when equipped with a capacitor and when without a capacitor. The test results show that in conditions without a capacitor the current value is 4.2 A and the power factor value is 0.5. Furthermore, based on tests on each capacitor, various current values and power factors were obtained. This research shows that the appropriate capacitor for a three-phase induction motor is a 6 μF capacitor. With the lowest average current value of 1.2 A and a power factor reaching 0.8. The addition of capacitors greatly influences the current value and power factor. The use of a 6 μF capacitor is able to overcome power losses and reduce large voltage drops. Apart from that, the addition of capacitors also succeeded in reducing the reactive power to a smaller level. Analysis of measurement data shows that before installing the capacitor the reactive power value obtained was high, reaching 2,243.7 VAR and after installing the 6 μF capacitor, this reactive power value decreased to 469 VAR.

Keywords: Power factor, capacitor, induction motor