

# **DESIGN AND ANALYSIS OF INCREASING EFFICIENCY OF SINGLE PHASE INDUCTION MOTOR USING VARIABLES R-L-C BASED ON ARDUINO MEGA**

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## **Abstract**

Induction motors are one type of electric machine that is widely used in everyday life for both industry and households. With rising energy prices it is imperative to replace inefficient motors with efficient motors. The start-up operation of the motor often results in a transient phenomenon which results in an increase in current magnitude causing a voltage drop. This study aims to determine the effect of adding RLC components when the motor is working on the motor current and voltage. The expected results in this study are to reduce the starting of the motor so that the results of the motor efficiency are obtained. The research was conducted by starting the motor directly and recording the value of motor voltage and motor current. After that the starting circuit is added with RL which is installed in series and C which is installed parallel to the motor. The value of the combination of RLC is varied so that the effect of each component can be seen. In the RLC circuit with different values R: 10, 15, 22 Ohm, L: 330, 220, 100 uH, and C: 5, 8, 16 uF. then the most efficient value is obtained at the value of R: 22 Ohm, the value of L: 100 uH and the value of C: 5,8,16 uF to the motor. At a voltage of 100, 140 and 200 volts with a value of R: 22 Ohm, L: 100 uH, and a value of C: 5 uF, the efficiency values are 72%, 72% and 97%.

Keywords: single phase induction motor, RLC circuit, Arduino.