

(The Effect of Variations in the Diameter of Motorcycle Alternator Coil Wire on Output Performance as a Prototype Generator for PLTPH)

Alex Taufiqurrohman Zain, S.Si., M.T. (*Chief Concelor*)

Zlatan Aditya Juliano

*Study Program of Automotive Mechanical Engineering
Majoring of Engineering*

ABSTRACT

This study aims to analyze the effect of wire diameter variations in a motorcycle alternator coil on generator output performance in a pico hydropower (PLTPH) prototype. The wire diameters used were 0.5 mm, 0.8 mm, and 1 mm, with a constant 35 turns per pole (12 poles). An experimental method was applied by measuring voltage, current, output power, and efficiency. The results show that the 0.8 mm wire diameter provides the best performance, with an average voltage of 109 V, current of 0.113 A, output power of 12.363 W, and efficiency of 12.62%. The 0.5 mm wire produced 11.733 W, while the 1 mm wire produced 10.856 W. These results indicate that smaller diameters increase resistance, while larger diameters reduce effective coil turns. Therefore, 0.8 mm is the optimal diameter for this configuration.

Keywords: *wire diameter, stator, generator, pico hydropower, efficiency*