TESTING PERFORMANCE OF WIND TURBINE
HORIZONTAL AXIS TYPE
(CASE OF STUDY 6 BLADE)

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Abstract

Wind turbine is fluid machinery with rotating blades that convert the kinetic energy of wind into mechanical energy. The wind energy sources including renewable energy types.

The equipment test is a type of horizontal axis wind turbine with blade number 6. Diameter and height of the turbine rotor is 1.2 m and 0.8 m. In this test, variation of wind velocity is 7.4 m/s, 8.2 m/s, and 9.4 m/s.

The results of testing is equipped with wind tunnel as flow rectifier. At a speed of 7.4 m/s at maximum load has a power turbine, rotating per minute(rpm), tip speed ratio and efficiency of 10.59 watt, 162 rpm, \( \lambda=1.37 \) dan \( \eta=13.18\% \). At a speed of 8.2 m/s at maximum load has a power turbine, rotating per minute(rpm), tip speed ratio and efficiency of 24.61 watt, 216 rpm, \( \lambda=1.68 \) dan \( \eta=22.48\% \). At a speed of 9.4 m/s at maximum load has a power turbine, rotating per minute(rpm), tip speed ratio and efficiency of 54.76 watt, 250 rpm, \( \lambda=1.67 \) dan \( \eta=33.23\% \).

Keywords: horizontal axis wind turbine, blade, wind velocity, tip speed ratio, rpm, power of turbine, efficiency, load.