

Savonius - Darrieus Turbine Design with Modification of Fin Addition to Improve Self Starting Ability

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ABSTRACT

Wind turbine is a converter device that converts the wind's energy to kinetic energy in order to turn the generator and produce electrical energy. Vertical wind turbine Savonius – Darrieus is an innovative developed wind turbine for wind with low speed. Vertical wind turbine has weaknesses in the first starting because it has low torque. The fin addition in the savonius turbine installation is purposed to increase the self starting's power to make the turbine works optimally. This research is aims to analyze the effect of fin addition against the performance of wind turbine especially for self starting's power. Savonius turbine U type is made of PVC with 0.4 meters height and 0.24 meters for the diameter, while Darrieus turbine is made of mahogany with 0.5 meters height, 0.3 meters arm length and 0.1 meters long chord. The test is conducted to wind tunnel with the wind's speed around 4-9m/s. The wind source blower in any variety with fin and without fin. The analyzing result shows that the fastest rpm for the wind's speed 6.3m/s is 195 rpm of fin variety test without generator. The maximum coefficient power that generated from wind turbine is 0.49 in the 4.7m/s wind's speed of fin variety test without generator, while the highest TSR is 0.97 in 6.3m/s wind's speed of fin variety test without generator. The average of analyzing the variety addition fin is affect against the optimal of wind turbine.

Keywords: Savonius - Darrieus Turbine, Fin, Self Starting, Wind Speed, Rpm, TSR, Power Coefficient