

## Outdoor Performances of Micro Scale Wind Turbine Stand Alone System

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**Abstract :** Recent current rapid industrial development and energy shortage are essential problems, which face most of the developing countries. Moreover, increased prices of fossil fuel and advanced energy conversion technology lead to the need for renewable energy resources. A study, modelling and simulation of an outdoor micro scale stand alone wind turbine was carried out. For model validation an experimental study was applied. In this research the aim was to clarify effects of real outdoor operating conditions and the instantaneous fluctuations of both wind direction and wind speed on the actual produced power. The results were compared with manufacturer's data. The experiments were carried out in Borg Al-Arab, Alexandria. This location is on the north Western Coast of Alexandria. The results showed a real max output power for outdoor micro scale wind turbine, which is different from manufacturer's value. This is due to the fact that the direction of wind speed is not the same as that of the manufacturer's data. The measured wind speed and direction by the portable metrological weather station anemometer varied with time. The blade tail response could not change the blade direction at the same instant of the wind direction variation. Therefore, designers and users of micro scale wind turbine stand alone system cannot rely on the maker's name plate data to reach the required power.

**Keywords :** micro-turbine, wind turbine, inverters, renewable energy, hybrid system

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