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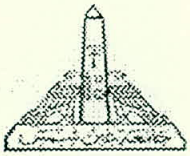

EFFECT OF SOME DESIGN PARAMETERS ON THE PERFORMANCE OF A GIROMILL VERTICAL AXIS WIND TURBINE

BY

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B.SC. IN MECHANICAL POWER ENGINEERING

FACULTY OF ENGINEERING AIN SHAMS UNIVERSITY

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EXAMINERS COMMITTEE

The undersigned certify that they have read and recommend to the Faculty of Engineering, Ain Shams University, for acceptance of this thesis entitled "EFFECT OF SOME DESIGN PARAMETERS ON THE PERFORMANCE OF A GIROMILL VERTICAL AXIS WIND TURBINE".

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PREFACE

This dissertation is submitted in partial fulfillment for the degree of Master of Science in Mechanical Power Engineering, Ain Shams University.

The work included in this thesis is carried out by the author at the laboratories of Mechanical Power Engineering Department, Faculty of Engineering, Ain Shams University.

No part of this thesis has been submitted for a degree or qualification at any other university.

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ABSTRACT

The Thesis describes the effect of some design parameters on the performance of a Giromill Vertical Axis Wind Turbine. A Giromill wind turbine has been designed, manufactured and tested. The turbine performance has been investigated with varying the design parameters such as, pitch angle, number of blades, airfoil type, turbine radius and blades chord length. Then, the results were used for the comparison between the performance achieved while changing the design parameters.

Many experiments have been performed with changing the above mentioned parameters. The effect of each parameter on the power coefficient and torque coefficient has been studied and explanation of the results was also discussed. It has been found that the pitch angle, turbine radius and chord length have a significant effect on the turbine performance.