Development of a Three Phase Induction Motor Controller for Solar Powered Water Pump

Abstract

This paper intends to develop a three phase induction motor controller for a solar powered water pump. In many areas, disrupted and inadequate power supply can cause significant damage in household or industrial activities which require water supply. Agricultural production is also hindered as most of the irrigation process is solely based on electricity. So far, DC motors have been used for solar application in Bangladesh due to the simplicity of their speed and torque control. But, DC motors ar every expensive. Additionally, regular maintenance of the commutator and brushes is necessary. A three phase induction motor can perform robustly in this field with the help of an inverter. The paper focuses on the developments of a three phase inverter to drive an induction motor through optimal control and design techniques, which can replace the DC motor. A three phase induction motor was successfully run with a prototype setup, established with 320Watt solar panel and a three phase inverter with appropriate and low cost gate drive circuit. The experimental results satisfied the demand as we effectively handled a water pump using three phase induction motor with optimal cost and efficiency.

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