



OPTIMAL PHOTOVOLTAIC WATER PUMPING SYSTEM PERFORMANCE UNDER DIFFERENT OPERATING CONDITIONS

G. El-Saady , El-Nobi A. Ibrahim , Mostafa Ahmed

Abstract:

This paper presents dc photovoltaic pumping system. The system consists of photovoltaic (PV) generator, boost converter and permanent magnet (PM) dc motor-pump set. Each part of the system is modelled. Photovoltaic generator parameters are extracted based on data-sheet parameters. Boost converter is designed to operate in continuous conduction mode (CCM) and controlled using incremental conductance (IC) algorithm for maximum power point tracking (MPPT). The system is simulated using Matlab/Simulink. The proposed system is studied under direct coupling and maximum power point tracking conditions. The results show a very good performance MPPT compared with direct coupling. The system is tested under varying conditions of temperature and radiation.

Keywords:

PV generator, pumping system, dc-dc boost converter and MPPT

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