

Abstract

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Parameters determination of grid connected interior permanent magnet synchronous generator

Renewable energy sources are being utilized as a reliable alternative to the traditional energy sources for electricity production. Among these renewable sources, wind energy has the largest and fastest penetration into power systems. This paper introduces a method for measurement of the equivalent-circuit parameters of an interior permanent magnet synchronous generator (IPMSG) used in a wind energy system which utilizes a full scale converter between the generator and the utility grid. The conventional two-axis IPMSG model is modified to include the saturation effect of the inductance in the q-axis including self-inductance values in the d- and q-axes, the stator resistance and also the PM flux-linkage. The modified model of the IPMSG is grid connected using full scale back to back converters which are used in grid active and reactive power control.