World Academy of Science, Engineering and Technology
International Journal of Electrical and Computer Engineering
Vol:11, No:08, 2017

Inverter IGBT Open–Circuit Fault Detection Using Park's Vectors Enhanced by Polar Coordinates

Authors : Bendiabdellah Azzeddine, Cherif Bilal Djamal Eddine

Abstract : The three-phase power converter voltage structure is widely used in many power applications but its failure can lead to partial or total loss of control of the phase currents and can cause serious system malfunctions or even a complete system shutdown. To ensure continuity of service in all circumstances, effective and rapid techniques of detection and location of inverter fault is to be implemented. The present paper is dedicated to open-circuit fault detection in a three-phase two-level inverter fed induction motor. For detection purpose, the proposed contribution addresses the Park's current vectors associated to a polar coordinates calculation tool to compute the exact value of the fault angle corresponding directly to the faulty IGBT switch. The merit of the proposed contribution is illustrated by experimental results.

Keywords : diagnosis, detection, Park's vectors, polar coordinates, open-circuit fault, inverter, IGBT switch
Conference Title : ICEE 2017 : International Conference on Electrical Engineering
Conference Location : Kuala Lumpur, Malaysia
Conference Dates : August 24-25, 2017