GENERALIZED MODEL OF THREE-PHASE INDUCTION MOTOR FOR FAULT ANALYSIS

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Abstract

Induction motors are critical components in many industrial processes. In spite of their robustness they do occasionally fail and their resulting unplanned downtime can prove very costly. Because of costly machinery repair, extended process down time, and health and safety problems, a trend in modern industry is to focus attention and resources on fault detection and predictive maintenance strategies for industrial plant Therefore, condition monitoring of electrical machines has received considerable attention in recent years. A suitable model enables motor faults to be simulated and the change in corresponding parameters to be predicted without physical experimentation. This paper presents a mathematical foundation and theoretical analysis of asymmetric stator faults in induction machines. A three-phase induction motor is simulated under normal healthy operation, unbalanced voltage and some general faults. Experimental verification of these faults is given in the second part of the paper.

Keywords: induction motor, fault diagnosis, and modeling.
