Detection and Diagnosis of Induction Motor Faults by Intelligent Techniques

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Abstract:

This paper presents a complete design and implementation of a monitoring system for the operation of the three-phase induction motors. This system is built using a personal computer and two types of sensors (current, vibration) to detect some of the mechanical faults that may occur in the motor. The study and examination of several types of faults including (ball bearing and shaft misalignment faults) have been done through the extraction of fault data by using fast Fourier transform (FFT) technique. Results showed that the motor current signature analysis (MCSA) technique, and measurement of vibration technique have high possibility in the detection and diagnosis of most mechanical faults with high accuracy. Subsequently, diagnosis system is developed to determine the status of the motor without the need for an expert. This system is based on artificial neural network (ANN) and it is characterized by speed and accuracy and the ability to detect more than one fault at the same time.

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