Frequency response analysis technique for induction motor short circuit faults detection

ABSTRACT

The paper presents the description for diagnostic methods of induction motor's stator windings fault. The presented methods use Frequency Response Analysis (FRA) technique for detection of Winding Faults in Induction Motor . This method is previously reliable method for faults diagnosis and detection in many parts of transformers including transformer windings. In this paper, this method was used for motor windings faults detection. This paper presents the FRA response interpretation on internal short circuit (SC) fault at stator winding on three cases studies of different three-phase induction motors (TPIM), were analysed according to two status: healthy induction motor at normal winding status and same motor with windings shorted of main windings. A conclusion of this paper provides the interpretation of and validation the FRA response due to internal SC fault case by using NCEPRI algorithm, which is considered as one of certified statistical indicators. The proposed method in this paper had a useful result for detect and diagnosis of stator windings faults of TPIM. The applications of developed method can be used to detece the other machines types faults.

Keyword: Frequency response analysis; Induction motor; NCEPRI algorithm; Short circuit fault; Stator winding fault