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Fault Detection in Induction Motor

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ABSTRACT

As we know the induction motor is processing the main part in the industries as well as the home appliance like motor pumping the water and is frequently effected by the open circuit, short circuit, earth leakage, and over loading faults, it is very difficult to identify and take long duration for identification of faults it causes main operation of the industry production for long duration of time to avoid this we are going to propose this project called smart fault detector of induction motor. In this project we are identify the type of fault occur in the induction motor and immediate intimate to the operator. So operator will take the necessary actions depends upon the type of fault so this will cause the major production of the industry will not shunt down for a long duration.

Keywords— Induction Motor, Faults, Operator

1. INTRODUCTION

In the world of the electrical machine, induction motor is one of the changeable inventions drastically used in the modern world. An induction motor is also popularly termed as asynchronous motor. It is an AC electric motor through which a medium of electromagnet induction a mechanical energy is obtained. Induction motor was first level induced by the scientist Nikola Tesla. An induction motor runs the principle of emf by which an AC power supplied to motors starter creates a magnetic field in turn rotates in synchronism. The rotor accelerates till torque and induced rotor current balances mechanical load on rotor rotation. An induction motor always operates slightly lower than the synchronous speed.

Induction motor has an advantage of running on either single phase or three phase powers, theoretical can have any no of phases. Generally, an induction motor is of two types they are given below in specific diagram. The induction motor is of single-phase mostly applied on low-power applications and

rarely used in industrial as well as domestic sectors like pumps, compressor drilling machine, electric shavers, mixers etc. Whereas three phase induction motor are self-starting on other side single phase type is not self-starting. This type of induction motor contributed its applications on cranes lifts, hoists, large exhaust fans, crush mills etc. In discussion of the proposed project, faults play an important role which in turn can be detected whether it may single phase or three phase, induction motor widely makes faults which sometimes makes a huge loss and increases man-power. The reason for fault on a induction motor mostly like over voltage, under current, under-voltage, under current, over loads etc. It is considered and suggested advice to protect induction motor from such faults. In other hand, motor may undergo nascent faults. In spite of this this concern, we focusing especially on the fault detection ideas, made a model to identically detect the faults at any certain the upcoming proposed system deals with the mechanisms which was developed named as "fault detection in induction motor" in this upcoming chapters this model evaluates the model circuitry and working.

2. PROPOSED SYSTEM

With the impact of detecting the identical faults in an induction motor. The idea composed was implemented as a model to detect the fault automatically nerveless like other system, this model looks small and feasible in fault detection in comparison of other existing methodology available on the table Motor Current Signature Analysis (MCSA) is widely used method to detect faults in induction motors. It aims in spectral analysis of stator current. When a machine is under fault state such as broken rotor bars, high damage and eccentricity of rotor axis will be detected. Even though increasing on identifying it came across some drawbacks. The native sequence it faced was it gets deg laded by increment of the load modifying the amplitude of fault. In addition with this, frequencies associated with this type depends on the particular motor conditions. It mainly come up with a power quality maintenance not all

caused by stator wildness keeping an eye on such of this existing method we encouraged a new system to sort out built in drawbacks of existing methods.

Our system “fault detection in induction motor” is a simple and reliable which can be used at any condition. It is structured in a way such that it can be evolved in any part of the motor. identically ,it will act on any kind of single -phase (or)three -phase induction motor. besides, its performance is simple and quickens in sorting the drawbacks and identifying faults our proposed model is developed in according with supply given parallel to an isolation and fault detection .it was whole handled by micro controller performing the total operation with the help of a relay. Here relay acts as a main source which identifies the fault occurred and turns up the isolation to reduce the fault angina on power loss and continuity.

3. BLOCK DIAGRAM

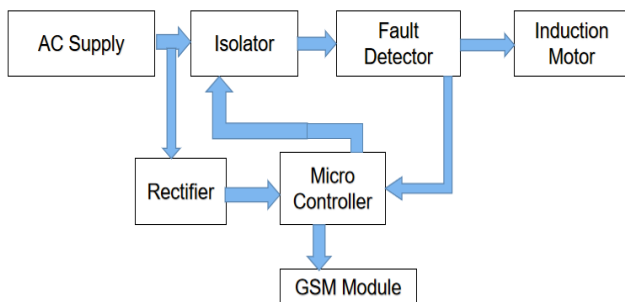


Figure 1: Block Diagram

The witnessed block diagram for the system “fault detection in induction motor “ is shown in the figure 1. Here micro controller acts as a key component in the detection .relay and isolation are primary moves in circuit . induction motor runs a normal condition with the designed model affixed on it supply for the model is given AC supply parallel with induction motor rectifier pinned micro controller is normally closed which awaits for next signal whenever induction motor forehead with overload (or)over current the supply activates micro-controller and relay in turn over rides into normally open condition and totally isolates induction motor from the an input supply GSM module alerts operator through communication in mobile call or message alert indicating the type of fault after correction the model is let into reset condition.

4. WORKING

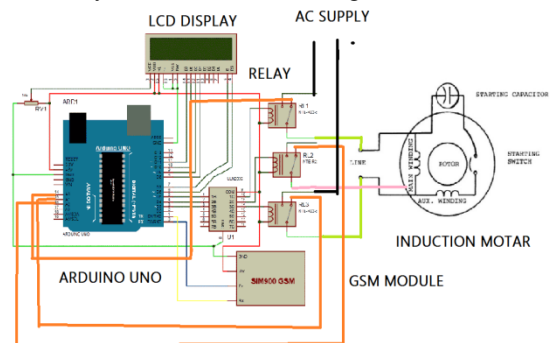
The proposed system is generally operating on the bias of isolation. The whole model is active with the micro controller unit. The idealized prototype consists of an MCU, GSM, Relay and Isolation . the whole kit is equipped with an induction motor which is small and reliable .in normal induction ,the relay is first initialized as normally closed (NC) condition without any activation. The supply for the circuit is taken main AC supply. Whereas the circuit required DC is taken from a separated adaptor in motor running state, whenever a fault is occurred ed without knowledge of humans, the micro controller circuit detects the faults and changes the position of relay to normal open (NO).in turn ,isolation getting immediate supply from the relay activates at the time and isolates/separates the motor from main supply. This isolation alerts the used through G.S.M linked mobile system. It alerts uses through a message or a call. In addition, it detects the evaluates which type fault the motor is facing and intimate’s user certain faults are overloaded (or)over current ,high voltage

,open circuit etc. after avoiding the from motor, the circuit is revised into reset option which turns into its initial stage.



5. CIRCUIT DIAGRAM

An abstract finalized circuit design for proposed system “fault detection in induction motor” with micro controller relay and GSM module made the idea feasible. The proposed circuit model for the system is shown in the fig 2.



Here the Arduino attached with a micro controller containing of pins. An input pin supply is directed into relay voltage required for operation is 5volt optimized from Arduino .addition LCD display and GSM module is holds with Arduino pins induction motor which required input supply for motor operation is given to relay which is normally closed (NC).Whenever a fault is identified , this relay from supply isolates the whole unit of motor into normally open (NO) indicating that circuit separates input AC supply and induction motor. After correction of faults in induction motor the circuit which is automatically setup for reset condition which turns into its initial state. The developed circuit structured as a small model makes a huge place and duty of fault detection of fault detection in induction motor.

6. CONCLUSION

As a part of conclusion and giving as a final statement we conclude, the product developed for fault detection is applicable in all type of sectors and any kind of phase currents. Developed model is small and made efficient which can be prefixed at any part of machine. Here, Relay which has small operating duty and isolating two systems acts a main and higher responsibility which switches its state for every action by detecting faults through micro controller unit.This circuit makes fault detection within time before any involvement of users and it automatically isolates whole system from input supply ahead of any phase. After fixing corrections and small errors this circuit gets switched into its initial state by setting reset condition. As a view on economic results, this model is made in order to be user friendly and cost-less taken by every individual.

7. ACKNOWLEDGEMENT

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8. REFERENCES

- [1] A Text Book of Electrical Technology Volume 2 AC and DC Machines.by BL Theraja.
- [2] Monitoring and faults diagnosis in Electric Motor Drive System (EMDS)by Jordi Cusido.
- [3] Stator Fault Detection in Induction Motor by autoregressive Modeling.
- [4] IEA (2019) Global EV outlook 2019. IEA, Paris. <https://www.iea.org/reports/global-ev-outlook-2019>.
- [5] Ishkova I, Vitek O (2015) Diagnosis of eccentricity and broken rotor bar related faults of induction motor by means of motor current signature analysis. In: 2015 16th international scientific conference on electric power engineering (EPE), 2015. IEEE, pp 682–686.

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