WIRELESS MONITORING OF THREE PHASE INDUCTION MOTOR

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Abstract –This paper is presented wireless monitoring of three phase induction motor driven by single phase. The speed controlled is also one of the main aspect and presented in this paper. Out of the various method of controlling induction motors, V/f controlled has proven to be the most versatile. The overall scheme of implementing V/f control To maintain reliability in power system it is important to protect the 3 phase devices like inductive, resistive etc against various faults occurring in it. This fault should be identified and analyzed quickly for their remedies. The aim of our project is to study and implement various fault detection technique and monitoring system. The purpose of this project is also to send the information to the mobile by using Global system for Mobile Communication (GSM) technology about the 3 phase operations

Key Words: Induction motor, PIC microcontroller, ULN2003 Driver IC, VFD,GSM, Temperature sensor.

1. INTRODUCTION

Three phase devices like Induction motors, transformers, etc, have a long service life if they are operated at its full load conditions. However, their life is significantly reduced if they are overloaded, unbalance power conditions resulting in unexpected failures and loss of supply to a large number of customers thus effecting system reliability. Overloading and ineffective cooling of 3 phased devices are the major causes of failure in power system. Online monitoring of key operational parameters of transformers can provide useful information about the health of 3 phased devices which will help the utilities to optimally use their devices and keep them in operation for a longer period.

There are various fault occurred in 3 phased devices which causes damaged to the operating parts if they are not diagnosed at quick time. It is thus important to monitor devices continuously. Real-time and Online monitoring is the solution for continuously observing the health.

In our project we will monitor various faults like, under voltage, Over voltage, Unbalance voltage, over Current, Single phasing, Over temperature and protect them against any abnormal conditions, same will be send in term of SMS using a GSM module. In addition to this we also give a provision for automatic restoration (reset) after fault may get OK, which result less human interactions.

2. LITERATURE REVIEW:

The relevant information about project report is explained in various technical book, research papers which we have referred. Drive been classified into two types as AC & DC. Variable Frequency Drive is a AC Drive used this Project.

The detail Drive operations, control strategies are presented and the operation of induction motor in all four quadrant i.e. forward motoring in first quadrant, forward braking in second quadrants, reverse motoring in third quadrant and reverse braking in fourth quadrant. Different types of control strategies i.e V/F control and PWM control is studied. Among these PWM method is used for Inverter O/p control. Hence, it is being implement in our project.

The description of various components such as 1ph Bridge rectifier, DC Bus, 3 ph Bridge Inverter presented in this report . In our project, we require pulse generation, constant voltage conditions, same will be send in term of SMS using a GSM module. In addition to this we also give a provision for automatic restoration (reset) after fault may get OK, which result less human interactions.

For monitoring and control purpose we are used a PIC microcontroller, Potential transformer (PT), Current transformer (CT), Regulator, Relay, LCD, GSM.

3. METHDOLGY:

In power plant most of the control cards, sensors, transducers, relays, etc., are operates on 220vdc to5vdc .generally power plant uses a transistorized power pack, which may lead increase in weight as well as size. Heavy heat-sinks are required to keep cool the transistors, which may again increase the surrounding temperature due heat dissipated by heat sink. These power pack works on simple zener regulation circuitry, which doesn't have any protection against over/under voltage and over current.

EXISTING POWER PACK

The importance of power supply in our project is to give continuous voltages to the various components like microcontroller, liquid crystal display, sensors, relays, drivers, etc. Power supplies are AC or DC types.

Two types of power supplies are there.

1. Unregulated DC power supply

2. Regulated DC power supply

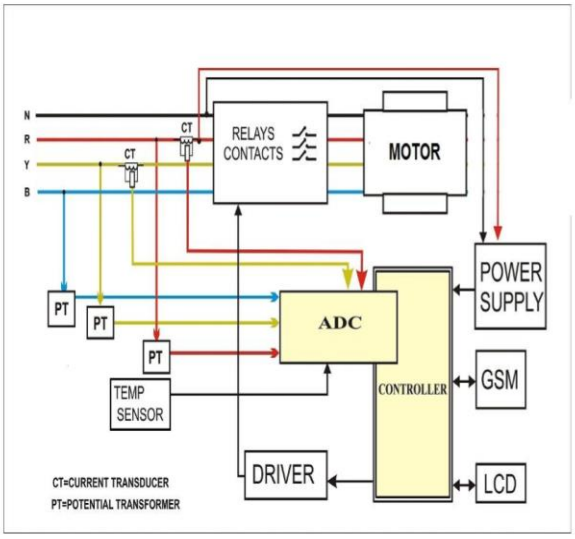
Unregulated power supply are those which are not constant, means if we design power supply which converts 220 volt AC to 12 volt AC with the help of resistances, inductors, transformers in which the output 12 volt is directly proportional to the input 220 volt

Regulated power supply are gives a constant voltages according to requirement of a circuit irrespective of any fluctuations.

In our project, some components required constant 5 volt like microcontroller, LCD, sensors and some requires 12 volts like relay and relay drivers.

3.1 BLOCK DIAGRAM:

BLOCK DIAGRAM:



3.2 BLOCK DIAGRAM DISCRIPTION:

In our project we will monitor faults like Over current and protect them against abnormal conditions, same will be send in term of SMS using a GSM module. In addition to this we also give a provision for automatic restoration (reset) after fault may get OK, which result less human interactions. For monitoring and control purpose we are used a PIC microcontroller, current transformer (CT), Regulator, Relay, LCD, and GSM Overloading and ineffective cooling of 3 phase motor are the major causes of failure in power system. Online monitoring of key operational parameters of motor can provide useful information about the health of 3 phased motor which will help the utilities to optimally use their devices and keep them in operation for a longer period. This will also help identify problems before any sudden failure which can result in a significant cost savings and greater reliability. There are various fault occurred in 3 phased devices which causes damaged to the operating parts if they are not diagnosed at quick time. It is thus important to monitor devices continuously. Real-time and Online monitoring is the solution for continuously observing the health.

4. IMPLEMENTATION:

We can remotely monitor the speed and frequency of VFD drive using a GSM module & start & halt operation of drive can also be controlled from distant place. A GSM modern is a specialized type of modern which accepts a SIM cards, & operates over a subscription to a module operator, just like a mobile. From the mobile phone which is helpful to send data of frequency, speed , phase rating, current & voltage to user in the format of text massage. It detect the fault occur on the system.

5. CONCLUSIONS

Due to daily increased load of power system it is important to maintain system Reliability .As transformer plays important role in power system by maintaining reliability it is important that we should keep transformer from daily fault occurring in it just by observing its key parameter so that such fault cannot result in bigger failure also apart from these sharing of data information is also essential using new technology at reduced cost. System to expert systems can be used to achieve all the parameters test and analysis of automation every system is automated in order to face new challenges in the present day situation. Automated systems have less manual operations, so that the flexibility, reliabilities are high and accurate. Hence every field prefers automated control systems. Especially in the field of electronics automated systems are doing better performance.

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