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# Induction Motor Protection Unit

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***Abstract :****Three phase induction motors are used in majority of the industries. During operational condition of such motors, due to poor power quality, there may be occurrence of electrical faults frequently. Finally it leads to affect the performance and reliability of the motors. Considering the above, this project envisaged to develop a prototype model of embedded motor protection scheme by analyzing the frequently occurring fault conditions and give better solution to solve the above problems. Non-invasive technique of voltage and current measurements are simple, economical and efficient one. There is no need of special sensors for fault analysis. Only optocoupler were used for measurements in this scheme. In this project, fault analysis involves the occurrences of the majority of electrical faults like single phasing, phase reversal, voltage unbalance, under and over voltages, earth fault, over heating, etc., So far, the researchers analyzed the induction motor performance during typical load conditions with electrical faults.. Based on the findings an improved protection scheme was designed.*

***Keywords –*** IM, under-voltage, single-phase, over-current, phase-reversal, etc...

## I. Introduction

The electric motor is a most crucial drive in modern era of automation. These motor are used in various industrial application. But these motor can be protected from the different mechanical and electrical faults for helping their purposes. This article discusses about a protection system for induction motor portion from emerging faults using embedded microcontroller. The induction motor experiences various kind of electrical faults such as over voltage or under voltage, unbalanced voltage, overload, earth fault, phase reversing and sing phasing. Due to these faults, the winding in the motor gets heated which lead to reduce the life of the motor. The faults in motor may occur due to faults in the motor or in the driven plant, Surroundings executed by the external power supply . the degree of the induction motor depends on the applications and cost of the motor.

Induction motor and a synchronous motor is the most commonly used motor in various applications. Because, these motor always run at a lower speed than synchronous speed. Synchronous speed can be defined as, the magnetic field of speed. which is rotating in the stator. Induction motor are classified into teo types based on the sort of input supply such as single phase induction motor and three phase induction motor induction motor are classified into four types namely; split phase induction motor, capacitpr start induction motor, capasitor run induction motor and shaded pole induction motor. And also based on the type of rotor three phase induction motors are classified into two types such as wound type, slip ring motor squirrel cage motor.

Need for automation:

Automation can be achieved through computers, hydraulics, rototics, etc…, of these sources for low cost automation. Automation plays an important role in mass production. The advantages of automations are

- Reduction of lab our and material cost
- Reduction of overall cost
- Increased production
- Increased storage capacity
- Increased safety
- Reduction in failure
- Improved personnel comfort

## II. Design Of Experimentation

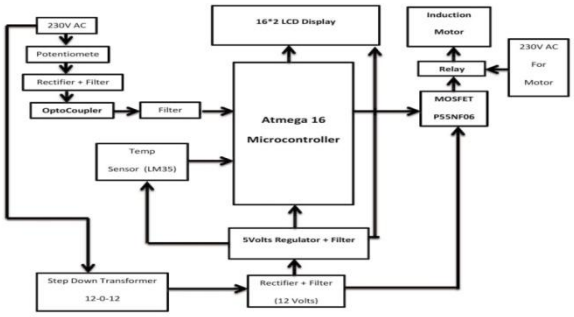


**Fig. 2.1** Block diagram of induction motor protection unit

## III. Circuit Diagram Of Regulated Power Supply

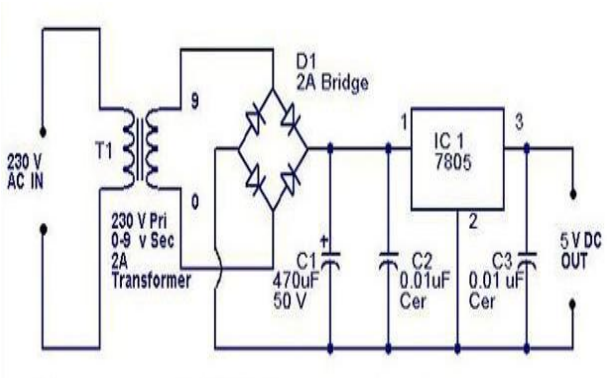


**Fig. 3.1** Circuit Diagram of 5V regulated power supply

Here, meanings of components are,

**C1:-** this capacitor is known as diversion capacitor and it is employed to diversion extremely tiny duration spikes to the ground with no distress the other components.

**C2:-** this is the filter capacitor employed to steady the slow changes in the voltage applied at the input of the circuit. mounting the value of the capacitor amplify the stabilization as well as the declining value of the capacitor reduces the stabilization. Moreover this capacitor is not alone capable to ensure very constricted period spikes appear at the input.

**C3:-** this is known as a filter capacitor employed in the circuit to steady the slow alterations in output voltage. increase the value of the capacitor enlarges the stabilization furthermore declining the value of the capacitor declined the stabilization. Moreover this capacitor is not alone capable to appear very fine duration spikes happen at the output.

**U1:-** U1 is IC with positive DC and it upholds the output voltage steady exactly at a constant value even although there are major deviations in the input voltage.

**Main Components of Circuit diagram**

1) Atmega16 MICROCONTROLLER
2) Optocoupler
3) 16*2 LED Display
4) LED
5) Resistor
6) Capacitor
7) Temperature sensor

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