

Advance Protection for Three Phase Loads

Ashish A.Damahe¹ Bhushan H.Rahangdale² Nandkishor D.Mohankar³ Shital L. Kamble⁴

^{1,2,3}Student ⁴Assistant Professor

^{1,2,3,4}Department of Electrical Engineering

^{1,2,3,4}MPCE Bhilewada, Bhandara, India

Abstract— This Project tends to develop for protection of three phase induction motor from single phasing, phase reversal, over voltage and under voltage. Due to this electrical fault the winding of motor get heated which lead to insulation failure and thus reduce the life time of motor. This fault is generated in induction motor due to variation in induction motor parameters. When three phase induction motor runs continuously, it is necessary to protect the motor from these anticipated faults. Three phase induction motor generally directly connected through the supply, if the supply voltage has sag and swell due to fault the performance of motor is affected and in some cases winding is burned out. When phase sequence (RYB) is reversed due to wrong connection then motor start rotating in another direction, if supply system has only one phase and other phase is disconnected then it is single phasing problem.

Key words: Fault, Over-Temperature, Over-Current, Over-Voltage, Microcontroller, LCD Screen

I. INTRODUCTION

In three phase induction motors and load when there is any fault in a single phase the motor will draw more current in other two phases and will supply reduced amount of load power. So as the efficiency of the system is decreased it is not economical to operate the load in this condition. So we design a system called single phasing preventer which will disconnect the load when there is fault in any of the phases. In this system Programmable OP-amp is used to measure all the three phase voltages and the output is then given to the driver IC. Controller circuit will acquire all the data and its algorithm will enable it to observe whether the load should be connected or not. If not then it will give the indication of the faulty phase on the LED so the maintenance person can easily resolve the problem. To measure the VOLTAGE we are using Potential transformers, here 230v/12-0-12 transformer is used and this transformer will give output in the form of voltage depends upon the load.

II. FAULT IN THREE PHASE DEVICES AND THEIR CAUSES

A. Over voltage:

In overvoltage protection system of 3 phase induction motor, protects the motor from overvoltage, the voltage which is higher than the rated voltage. In circuit diagram of overvoltage protection it consists the comparator which compare two voltages one is supply and another one is drop across the variable resistance. When the voltage drop across the variable resistance is higher than specified value then comparator generates signals. This signal is fed to microcontroller and microcontroller takes the appropriate action.

B. Overheating:

In under voltage protection of 3 phase induction motor provides the protection from the under voltage. When supply system has low voltage than the rated of induction motor then under voltage protection section of protection supply is provided to motor. Single phasing works. It has same concept as overvoltage it also has comparator which compare two voltage one from supply and another from the voltage drop across the variable resistance. When voltage drop across the variable resistance is lower than specified value, this signal sends to microcontroller and microcontroller stop the operation of motor in the case of running and fails to operate in case of starting.

C. Single phasing:

In single phasing protection to 3 phase induction motor, if other two phases is faulted and only one protection of motor section starts functioning. Generally in single phase supply voltage is lower value than specified value. On this value of voltage motor is unable to start. Comparator which compares single phasing supply voltage and rated specified voltage, and single sends to microcontroller and microcontroller generates single which stop the motor if motor is running and does not allow to motor start in case of standstill. Sometimes single phasing protection looking much motor important when the motor is tight which important function like furnishing, pump driving and crane driving etc.

III. PROPOSED SYSTEM

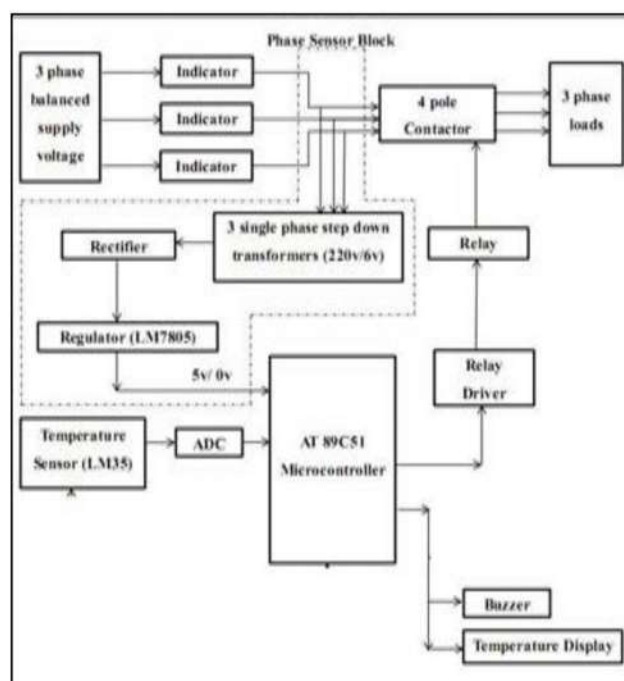


Fig. 1: Block Diagram of Fault Monitoring and Protection of Industrial Load