

INDUCTION MOTOR PROTECTION

Mr. Sachin Jadhav.
Student: Department of Electrical
Engineering
SSIRERAS. Rahatra
Ahmednagar, India.

Miss. Deboshmita Mondal.
Student: Department of Electrical
Engineering
SSIRERAS. Rahatra
Ahmednagar, India.

Mr. Ravindra Shelke.
Student: Department of Electrical
Engineering
SSIRERAS. Rahatra
Ahmednagar, India.

Prof. Gaikwad D.D
Assistant Prof
Department of Electrical
Engineering
SSIRERAS. RAHATA
INDIA

Abstract— As in our day to day life the demand for new and fine product and technology is increasing the industrial load is also have increase. to meet this demanding nature of human many automation industries have introduced the use of induction motor in industries. As the demand increases the work load on motor also increases. Perhaps the tension on the motor increases which may lead to future wear and tear of machine ,so in order to give motor about 95% to 98% of protection this project is introduce. This article well help people to know about the induction motor protection and it will also help researcher to improve protection system for machines. In hope which will lead to more smart city ,digital world and may also give better quality product or it may lead us one step further to better half for our future.

Keywords— Induction Motor, Faulty Condition protection, Microcontroller, Simulation Condition.

I. INTRODUCTION

For the betterment of induction motor it is essential to give protection to motor. Our project shows the overall protection description . In our project we have use Adriano kit and Microcontroller for the betterment of project. There are many different technology for the fault detection in induction motor . This protection scheme protect during over voltage, under voltage, temperature rise, short circuiting, Phase shifting time . In this article when ever any faulty condition occurs the overall process is monitor by ATmega32 microcontroller. This microcontroller can sense 8 analog input and 6 analog input up to 5V, for voltage and current distortion. And remaining inputs can be use receive information from motor ,like temperature rise, speed ,etc. The microcontroller sense the voltage and compares with reference voltage. This same process takes place for current, temperature, speed, etc. After comparisons if the value is near what equal to the reference value then it is normal condition . And if the rated value is beyond the reference vale then it is faulty condition , hence the microcontroller sends trip signal to contactor or relay.

II. BLOCKDIAGRAM.

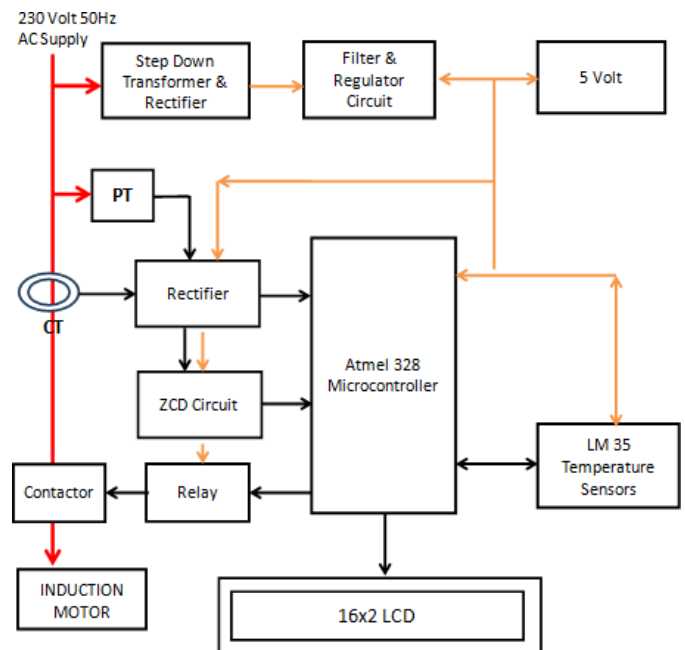


Fig. Block Diagram of Induction Motor.

A. Power supply.

Powersupplyarevarious typebuttherethepowersupply is designed to convert high voltage AC mains to suitable low voltagesupplyforelectroniccircuitsandother devices.

B. Step downTransformer.

Transformer is a static device, which help to transform electrical energy from one form to another without any changes created in voltage, frequency and current. A step down transformer helps to reduce the voltage in the system.

C. Filters

Filters are use in this project in order to element the harmonic present in the system. This harmonic can be present in supply system or can get generated during step-downing of energy.

D. PT (Potentialtransformer)

PT is use for the measurement of voltage in the system.

E. Rectifier.

Rectifiers are use to convert the AC voltage to DC supply of electronicdevices.

F. ATMEL 328Microcontroller.

This microcontroller is use as a CPU unit in system .This kit helps to process data, compare it, makes decision and also helps to give command during faultycondition.

G. ZCD.

Zero Crossing Detector is use to change the output value of comparator when AC input crosses the zero reference voltage.

H. Relay.

Relay is known as electrical controlled device which is use to detect faulty condition in the system. It also hepls to activate and deactivate the devices during the faulty conditions.

I. LMSensor.

LM Sensor is use to detect the temperature rise in machine.

This sensor is connected to the microcontroller to store data in it , to compare data with the reference values in the system. This sensor is specially use to determine the temperature rise in the windings of the motor.

J. 16x2 LCD.

16x2LCD is use to display the output reading of machine. It also gives the output process situation status. This LCD helps the operator to give command to themicrocontroller.

III. PROJECT DESIGNINEN

This project is totally PCB mounted project ,one can easily design the circuit on PCB this helps to reduce the size of project. And only main thing is that the person should have knowledge about AUTO-CADD. After designing mounting of equipment gets far easier.

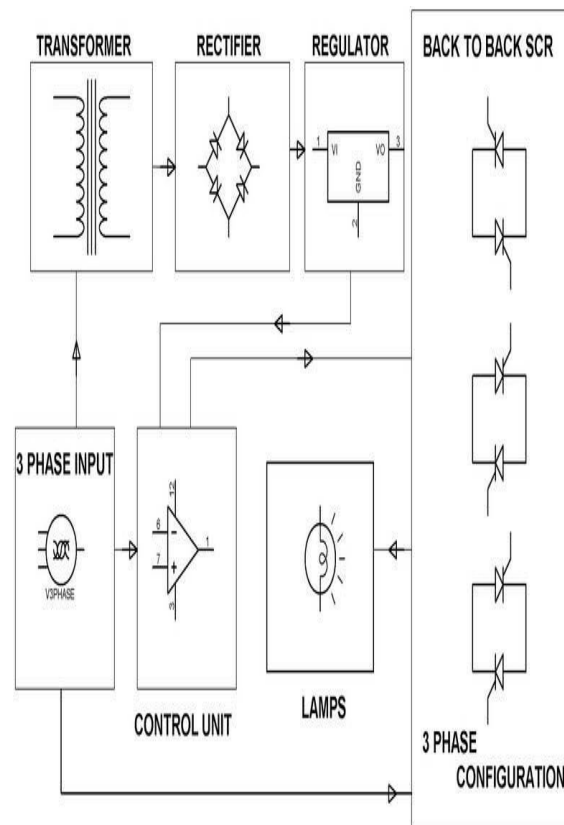


Fig Circuit Diagram

IMPLEMENTATION OFPROJECT.

This project can easy varied according to the requirement of consumer demand, easy to handle and operate can be easilly mounted on machin du to it low weight and compress size.

A. APPLICATION.

- Industrial machinery
- House hold items like TV , refrigerator
- Agriculture motors
- Water pumps
- Microwave oven
-

Possible additional circuits:

- ☐ Earth fault detection
- ☐ Automatic starting protection

Equipment use in Circuit:

- Transformer 12v
- Bridge wave rectifier
- Capacitors-480, 0.1micro farads
- Regulator IC 7812
- Potentiometer-50k
- Zener diode-6.8v, 6.0v

□ □ Conclusion

system should be protected by certain protection scheme. Sohere system modeled using comparator and relay to disconnect supply when any overvoltage and under voltage problem occurs.

From above discussion it has cleared that of under voltage and overvoltage problem are very common and can create problem for consumer good and industrial application

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