

V. THE PROPOSED SYSTEM

The hardware requirements of this project include op-amps, resistors, capacitors, diodes, thermistor, transformers, relays, microcontroller. The protection system for 3-phase induction motor is represented by the block diagram in Fig.3.

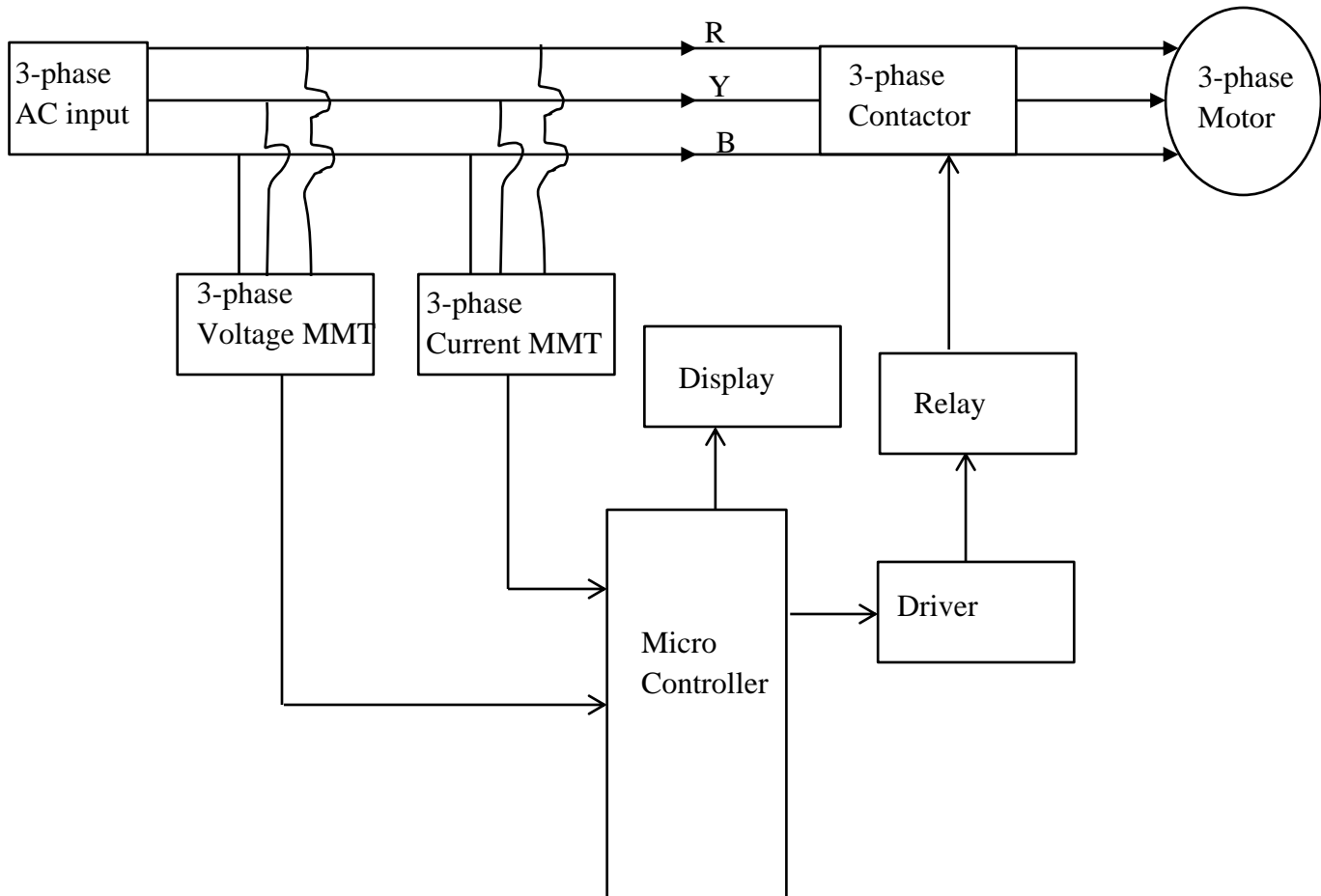


Fig.4.. Block Diagram of System

For the implementation of various protections, protection schemes are used. The values of voltage and current of the motor and the problems occurring in the motor and monitored, detected by the microcontroller, and the warning signals are displayed on the LCD. The motor will trip if any fault occurs. The faulty conditions considered are overload, overcurrent, over voltage, under voltage, unbalanced voltage, phase reversing and single phasing.

Circuit diagram of the microcontroller is depicted in Fig.4.

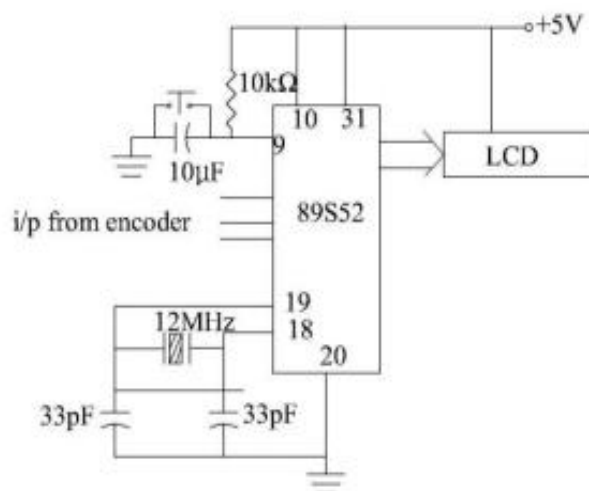


Fig.4. Circuit diagram of microcontroller

Over current protection: Over current protection protects the three phase motor when the current in the motor exceeds the rated value. The over current relay senses the current in each phase and current value exceeds the its rated value, the comparator gives signal to the microcontroller to stop the motor and the nature of the fault is display on the LCD.

Single phasing protection: If single phase supply voltage is lower than the specified voltage, the motor is unable to start. Comparator compares the single phasing supply voltage and the specified voltage and the sensed value is sent to the microcontroller to stop the motor from running.

Overvoltage protection: Over voltage protection is a power supply feature which shuts down the supply, or clamps the output, when the voltage exceeds a preset level. The protection involves setting a threshold voltage above which the control circuit shuts down the supply. The comparator sends signal to the microcontroller when the supply voltage exceeds the preset value and the supply voltage is shut down.

Undervoltage protection: If the supply voltage has low voltage than the rated voltage of the induction motor then under voltage protection section of the protection supply is applied to the motor. It has the same concept as overvoltage; as a comparator compares two voltages. Signal is sent to the microcontroller and microcontroller stops the operation of the motor, in case it is running, and will not operate, in case of starting.

VI. CONCLUSION

This paper presented a reliable, fast and efficient for induction motor protection. It is recommended for the industry in all cases of drives employing induction motors. Protection of three phase induction motor from electrical faults ensures continuous and smooth running of motor, and improves its life span. The prototype model of microcontroller based protection system is very simple in design, reliable, and cost effective and guarantees quick response.

References

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