

“PROTECTION OF INDUCTION MOTOR FROM SINGLE PHASING AND OVER TEMPERATURE”

Under the guidance of MR. MAHENDRA PRATAP DEO (Electrical Dept.)

ABSTRACT

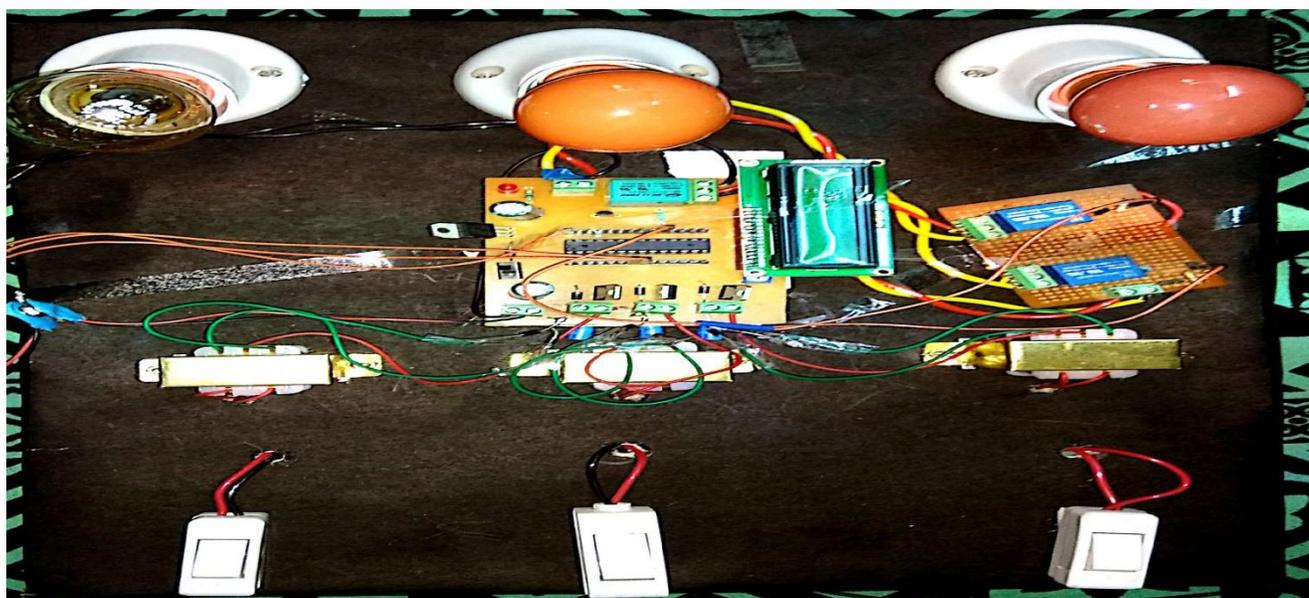
The topic is introduced to protect an induction motor from single phasing and over temperature. Providing a protection system is very important in industries, using lot of motors such that production is not hampered owing to failure of any motor.

The basic idea for the development of this topic is to provide safety to the industrial motor/pump/lift Motor etc. If any of the phases, out of the 3 phases is missing or if the temperature of the motor during operation exceeds the threshold value, motor stops immediately. The system uses a 3-Phase power supply where three single phase transformers are connected to it. If any of the phases is not available the corresponding transformer stops supplying power to the circuit. This leads to one of the four relays getting switched OFF. The main relay which is powered through a set of four relays gets disconnected because of one relay not being powered. Thus the main relay that delivers 3 phase supply to the motor gets disconnected. A thermistor is connected to the motor body to sense the temperature. If the temperature increases then supply to the fourth relay is disconnected.

Three phase induction motor generally suffers from overheating, single phasing and phase reversal problems. The rise in temperature level of a motor during its operation beyond a permissible limit is known as overheating. The causes of motor overheating are motor overloading, distortion in the supply voltage, impaired cooling capability, unbalanced supply voltages etc. Because of overheating, we can face the problems such as Electrical fire, Insulation failure, Decrease in life time of motor due to earlier wear and tear of the motor windings etc.

Hence, for three phase induction motors, it is necessary that all the three phases of supply be present and the Motor Temperature be within the permissible limits. Hence, for the protection of the motors from mechanical damage and to increase its life time, it is very necessary to protect the phase motors from Single Phasing and Overheating. In this project, we are going to design a hardware circuit to prevent the three phase loads from single phasing or overheating by disconnecting the load from the supply whenever any one of the two occurs, to monitor the current status of the motor by the help of LCD screen showing the current temperature and bulbs showing which phases are currently present, inform the user through alarm and by sending SMS to the user's mobile whenever any one of the abnormal condition occurs.

In the case of motor overheating a LM sensor is used which senses the temperature of winding if it exceeds the specified limit then once again motor fails to start. It is highly desired that 3 phase induction motor works freely from these all types of faults. Induction motor is the most widely used motor in the industry due to its simple and rugged construction. It requires least maintenance as compared to the other electrical motors. Induction motor speed control is nowadays more easy and versatile due to the advancement in the field of power electronics and hence is easy to replace other costly and controllable motors. The protection of induction motor plays an important role in its long life service. Researchers have done costly and limited protection for the stator windings protections, broken rotor bars protection, thermal protection.



Group Members

				
ALOK KUMAR	GIRISH VERMA	NARENDRA SAXENA	SUMIT SHARMA	VINOD KUMAR

FINAL YEAR ELECTRICAL ENGG. STUDENTS, REC BANDA