

Microcontroller based automatic Single Phasing Preventing System for 3-phase Industrial Motors

The aim of this project is to construct a single phasing monitor and prevention system using 8-bit microcontroller. Anti-single phasing relays or single phasing preventer are required for critical loads and circuits. These are required because the normal overload protection doesn't trip on time. For large air-conditioning compressors, irrigation pumps these are sometimes, included.

The purpose of this project is to develop an intelligent system that continuously monitors all the three phase voltages (High voltage AC) and if any of these three phases is disconnected then this system takes the preventive action. The preventive action could be disconnecting the power supply immediately to the load by operating an electromagnetic relay. This system also alerts the user using buzzer alarm system.

This system consists of three optically isolated high voltage sensors for sensing the presence of high voltage in the respective circuits. One of the voltage sensors is connected to phase line of the supply and the other is connected to neutral line. A microcontroller based control system continuously monitors the voltage in all the three phases of the power supply circuit. In ideal conditions all the three phases gets the same voltage. The visual indicators display the health status of all three phases (Red, Yellow and Green). But, when any of the phases gets disconnected then in such situations the microcontroller-based system alerts the user using buzzer alarm system.

The main objectives of the project are:

1. Automatic monitoring of all the phases.
2. Automatic switching OFF the motor if any of phases is off.
3. Alerts using buzzer.

The project provides the following learning's:

1. Conversion of AC supply to DC supply
2. Monitoring three phase supply.
3. Embedded C programming.
4. Interfacing high 3-phase motor to Microcontroller.
5. PCB designing.
6. Relay operation .and interfacing.

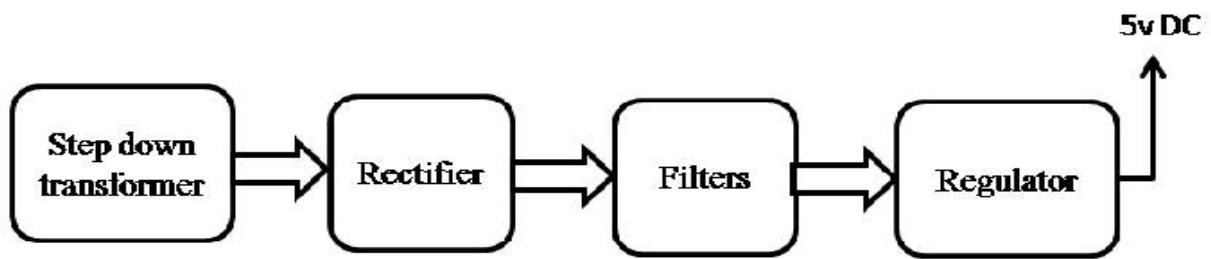
The major building blocks of this project are:

1. Regulated Power supply.
2. Microcontroller.
3. High voltage sensors.
4. Optical Isolation circuit.
5. Relay with driver.
6. Reset.
7. Buzzer with driver.
8. Crystal oscillator.
9. LED indicators.

Software's used:

1. PIC-C compiler for Embedded C programming.
2. PIC kit 2 programmer for dumping code into Micro controller.
3. Express SCH for Circuit design.
4. Proteus for hardware simulation.

Regulated Power Supply:



Block Diagram



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