

PROJECT 11

OVER VOLTAGE PROTECTION SYSTEM

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GII ES & IOT

Overview:

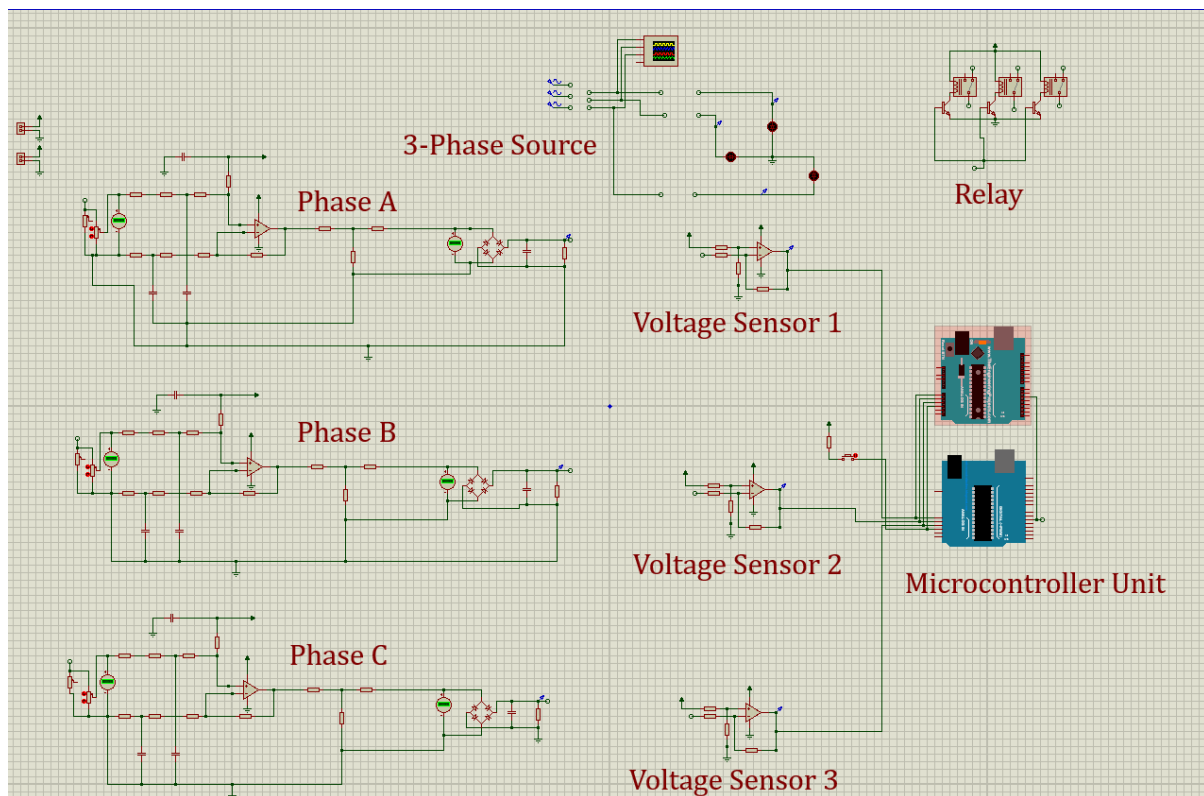
The project designed, focuses on the protection of a 3-phase power system in the event of an voltage overload. In industrial power applications, overvoltage is a serious concern that needs to be addressed quite quickly in order to minimize damage. Our project focuses on the implementation of such as a system, that will protect industrial equipment in an over-voltage condition. Based on some necessary assumptions, restrictions and

industry-grade emulation, we designed a micro-controller based system to successfully carry out our objectives.

Components Used:

- Arduino UNO R3
- Relay Block
- Voltage sensor Block
- Voltage Rectifier Block
- 3-Phase Source

Schematic Diagram:



Arduino Code:

```
int control = 5;

//For delay

unsigned long counta = 0;
unsigned long countb = 0;
unsigned long countc = 0;
unsigned long count = 9600;

void setup() {
  // initialize serial communication at 9600 bits per second:
  Serial.begin(9600);
  pinMode(control, OUTPUT);
  digitalWrite(control, LOW);
  delay(3000); // Delay at starting
}

// the loop routine runs over and over again forever:
void loop() {
  // read the input on analog pin 0:
  int sensorValuea = analogRead(A0);
  int sensorValueb = analogRead(A1);
  int sensorValuec = analogRead(A2);
  // Convert the analog reading (which goes from 0 - 1023) to a voltage (0 - 5V):
  float voltagea = sensorValuea * (5.0 / 1023.0);
  float voltageb = sensorValueb * (5.0 / 1023.0);
  float voltagec = sensorValuec * (5.0 / 1023.0);
  // print out the value you read:
  //Serial.println(voltagea);
  //Serial.println(voltageb);
  //Serial.println(voltagec);
  //Serial.println(".....");
  //Serial.println(counta);
```

```

//Serial.println(".....");
if ((voltagea < 3)) {
    //digitalWrite(control, HIGH);
    counta = counta + 1UL;
    if (counta > count) {
        digitalWrite(control, HIGH);
    }
}
else if ((voltageb < 3)) {
    //digitalWrite(control, HIGH);\
    countb = countb + 1UL;
    if (countb > count) {
        digitalWrite(control, HIGH);
    }
}
else if ((voltagec < 3)) {
    //digitalWrite(control, HIGH);
    countc = (countc + 1UL);
    if (countc > count) {
        digitalWrite(control, HIGH);
    }
}
else
{
    int s = analogRead(A3);
    //Serial.println(s);
    Serial.println(".....");
    if (s == 1023)
    {
        digitalWrite(control, LOW);
        counta = 0;
        countb = 0;
        countc = 0;
    }}
}

```

Difficulties:

- The project done using Proteus 8.6, which did not fully comply while running the simulation in real-time.
 - The input voltage had to be kept within a certain range in order for the voltage sensor to read the voltage properly.
 - While creating the PCB layout for the design, some of the components did not contain PCB packages, and the correct model was quite difficult to find for Proteus 8.6.
 - Certain restraints had to be taken while simulating the model of an industrial load.
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