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Prevention of Casuality in Automobiles due to Air conditioners

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ABSTRACT

Now a day the rate of deaths are increased because of sleeping in the automobiles with Air conditioner. In our project we have proposed a concept to prevent the death during such situations. The causes of death are because of the presence of carbon monoxide and R134A [Refrigerant] in air conditioning. Here we are using two different gas sensors to measure the values of both the gases in safer levels. We are using Arduino to control the levels of gases which won't cause any death. The control of gases is done by indication the people through alarm / buzzer at minimum level were people will be in conscious state and by opening the power windows at maximum level when they are in unconscious state.

Keywords: **Arduino, CO, R134a.**

1. INTRODUCTION

This paper based on the real time incidents happening throughout the world. The comfort zone of each and every people makes a disadvantage through physically; likewise this Air conditioning system concept in automobile takes an extreme disadvantage of taking a life of human being. This happed and became an issue on 25 august 2012 on UAE.

Here our proposed concept is to save the life even they are sleeping in car, the controllers and the sensors we are using is an affordable one on which this project can be installed in all the cars which has a power window.

2. METHODOLOGY

The objective is to design and develop a project that reduces cost of developing a system which prevents the death due to the automobile air-conditioning system. We are following a basic method in which the system is very simple in construction and operation too.

3. FUNCTIONAL DIAGRAM

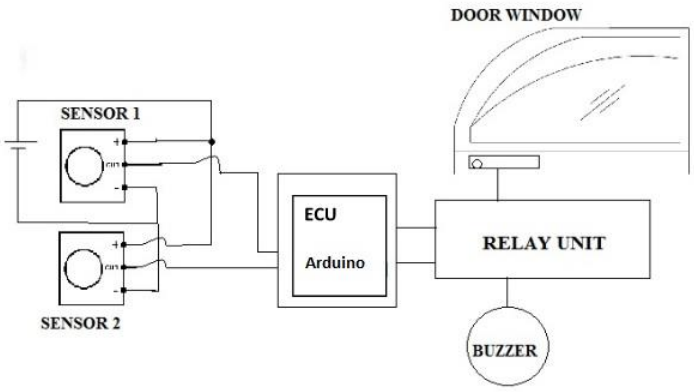

Fig 1.Functional diagram of sensing process and controlling

4. FLOW CHART

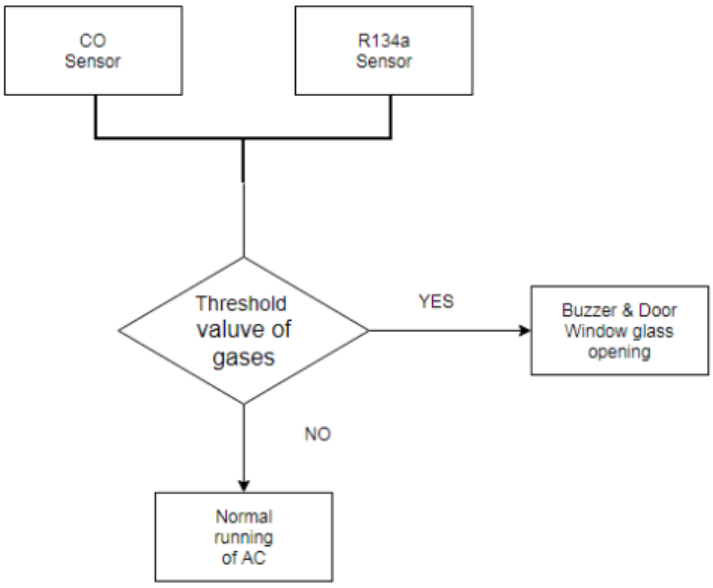

Fig 2. Flow Chart of the Process

5. WORKING

The controller used here is Arduino which is easy to program and easy to interface the sensors. The two sensors CO sensor and R134a sensor are interfaced with the arduino as inputs and the power window and a buzzer is connected as outputs. The threshold level of the carbon monoxide and R134A are pre-calibrated and the analog signals of the sensors are sent to the arduino as input and the programming is done on C language and dumped into Arduino. When the ignition system of the vehicle is in OFF state and if the AC remains in ON state the arduino starts monitoring the level of CO inside the vehicle through the sensors. If the sensor senses the level of CO reaches the pre calibrated threshold value the Arduino starts to enable the buzzer to alert the person and opens the power window glass manually to allow the fresh air to come inside and to dilute the amount of CO. if the windows are opened the level of CO will rapidly increases and it exceeds the pre calibrated threshold level in this situation the power windows control will be override and it will be forced to open automatically.

6. MAJOR COMPONENTS

6.1 Thermistor

A thermistor is a type of temperature sensor used as the input to the controller to keep the system in ON condition at the desired temperature. In which the monitoring and controlling of CO will be done only at certain levels which exceeds the threshold level.

6.2 CO SENSOR

Carbon monoxide detector or CO detector is a device that detects the presence of the carbon monoxide (CO) gas in order to prevent carbon monoxide poisoning. In the late 1990s Underwriters Laboratories changed their definition of a single station CO detector with a sound device in it to a carbon monoxide (CO) alarm.

This applies to all CO safety alarms that meet UL 2034 standard; however for passive indicators and system devices that meet UL 2075, UL refers to these as carbon monoxide detectors.

CO is a colorless, tasteless and odorless compound produced by incomplete combustion of carbon-containing materials. It is often referred to as the "silent killer" because it is virtually undetectable by humans without using detection technology and, in a study by Underwriters Laboratories, "Sixty percent of Americans could not identify any potential signs of a CO leak in the home".

Elevated levels of CO can be dangerous to humans depending on the amount present and length of exposure. Smaller concentrations can be harmful over longer periods of time while increasing concentrations require diminishing exposure times to be harmful

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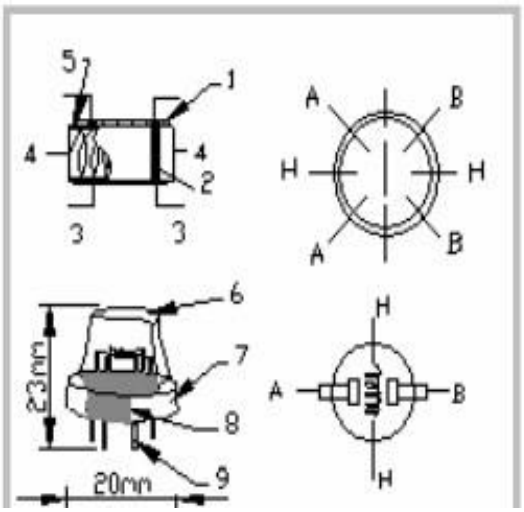

	Parts	Materials
1	Gas sensing layer	SnO_2
2	Electrode	Au
3	Electrode line	Pt
4	Heater coil	Ni-Cr alloy
5	Tubular ceramic	Al_2O_3
6	Anti-explosion network	Stainless steel gauze (SUS316 100-mesh)
7	Clamp ring	Copper plating Ni
8	Resin base	Bakelite
9	Tube Pin	Copper plating Ni

Fig 3. Co sensor pin configuration

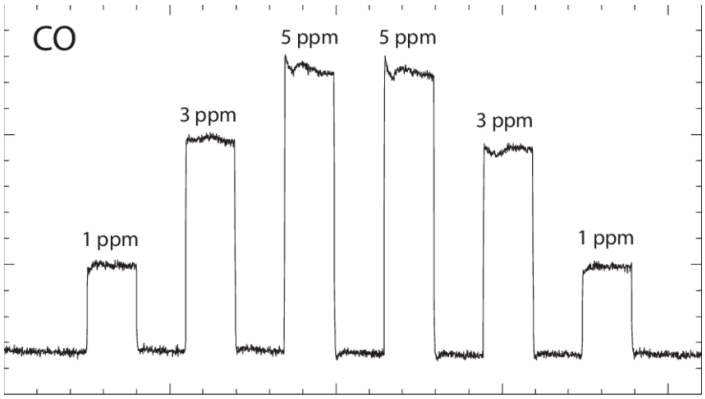

Fig 4 . CO sensor PPM details

6.3 R134A

Tetrafluoroethane (also known as norflurane (INN), R-134a, Freon 134a, Forane 134a, Genetron 134a, Florasol 134a, Suva 134a, or HFC-134a) is a haloalkane refrigerant with thermodynamic properties similar to R-12(dichlorodifluoromethane) but with insignificant ozone depletion potential and a somewhat lower global warming potential(1,430, compared to R-12's GWP of 10,900). It has the formula CH2FCF3 and a boiling point of −26.3 °C (−15.34 °F) at atmospheric pressure. R-134a cylinders are colored light blue. Attempts at phasing out its use as a

refrigerant with substances that have lower global warming potential, such as HFO-1234yf, are underway.

6.4 Arduino

Arduino is an open-source hardware and software company, project and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical and digital world. Its products are licensed under the GNU Lesser General Public License (LGPL) or the GNU General Public License (GPL),[1]permitting the manufacture of Arduino boards and software distribution by anyone. Arduino boards are available commercially in preassembled form or as do-it-yourself (DIY) kits.

Arduino board designs use a variety of microprocessors and controllers. The boards are equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards or breadboards (shields) and other circuits. The boards feature serial communications interfaces, including Universal Serial Bus (USB) on some models, which are also used for loading programs from personal computers. The microcontrollers are typically programmed using a dialect of features from the programming languages C and C++. In addition to using traditional compiler toolchains, the Arduino project provides an integrated development environment (IDE) based on the Processing language project.

7. PROGRAM

```
const int AO=0;
const int DO=8;
const int buzzer=11;
const int motor= 12;
long limit;
long sensorvalue;
long voltage;
long ppm;
void setup()
 {
Serial.begin(9600);
pinMode(AO,INPUT);
   pinMode(DO, INPUT);
   pinMode(buzzer, OUTPUT);
   }

void loop()
{
   sensorvalue = analogRead(AO);
```

```
    voltage=sensorvalue*3/4095;
    ppm = 3.027*1.0698*voltage;
    Serial.print("CO ppm: ");
Serial.print(ppm);
    delay(100);
if (ppm >40)
        {
digitalWrite(buzzer, HIGH);
        }
else
        {
digitalWrite(buzzer, LOW);
        }
    if (ppm >50)
        {
digitalWrite(motor, HIGH);
        }
else
        {
digitalWrite(motor, LOW);
        }
}
```

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