LPGGASDETECTION

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Abstract— LPG gas is a highly flammable gas that catchesfireveryeasily.Itismostlyusedincooking because it undergoescompletecombustion. It also produces enough heat to cook food in less time. Using it at home is dangerous as there are many things at home that catch fire. There are cases of leakage of gas which result in fire. So, there are manyLPGgasdetectorsbuttherearesomemissing things inthem[1]. Theyare not fullydevelopedto create their efficiency. Our paper has a design which includes different things that can minimize the effect.

This LPG gas detector design includes power cut, motorized windows, buzzer, LPG gas detector. It allhappenswiththehelpofMQseriessensors,and with the help of an Arduino board.

Keywords:ArduinoUno,Motorizedwindow,LPG gas, MQ sensor, buzzer.

Introduction

LPG gas has become a very important part of our daily life. As it is used in cooking at homes. Nowadaysitbecomesquitedifficult forustocook food easily without this gas. It becomes a needed hour for us. This gas undergoes complete combustion and has enough heat to cook food in lesstime. That iswhyit ispreferredbut thisgas is dangerous as well as it is highly flammable gas. It can cause fire as this gas catches fire froma short distancealso.Inpastyearsitcausedahugeamount of loss due to its leakage. There is addition of ethane thiolwhichsmellsdifferent and people can easily recognize this gas[2].This gas causes a huge amount of loss not only to materialistic things not but also causes death of livingbeings.In1984,duetoleakagethiscausedahugeamountofdestructionduetoexplosionsatthefactoryandthe placesnearit.Eventhesmellofthisgas is toxic which can easily cause death to those who have respiratory disease. Leakage happens duetomanyreasonslikebrokenregulators,broken seal of the gas cylinders and due to improper handlingofthegascylinders.Therecanbeaminor mistake from our side but it can cause a huge amount of loss in the end. We cannot ignore even small mistakes in this case. This gas is very delicate. One needs to understand that it is important to take proper safety measures before usingthesetypesofgases. Asthesegasescanburn out the whole place with a blink of an eye. We cannot even imagine the situation of the people who suffered due to the gas leakage. There is an additionofethane thiolwhichsmellsdifferent and people can easily recognize this gas [3].

For safetythereare manyLPGgasdetectorsatthe marketbuttheyonlyperformoneortwooperations which creates a situation of risk. So, we came up witha designthat canperformas manyoperations inasinglesystem.Operationsare likedetectionof gas, power cut, buzzer, alerting lights, alarms and also displaying a message on a screen for alerting people around. This all is possible due to use of Arduino Uno, MQ series sensors, LCD pin configuration, buzzer, breadboard etc. [4]

Itispocketfriendlydesignasitdoesnotcostmuch. At low rate it protects the expensive things from burning due to LPG gas leakage [5].

III. BlockDiagram:

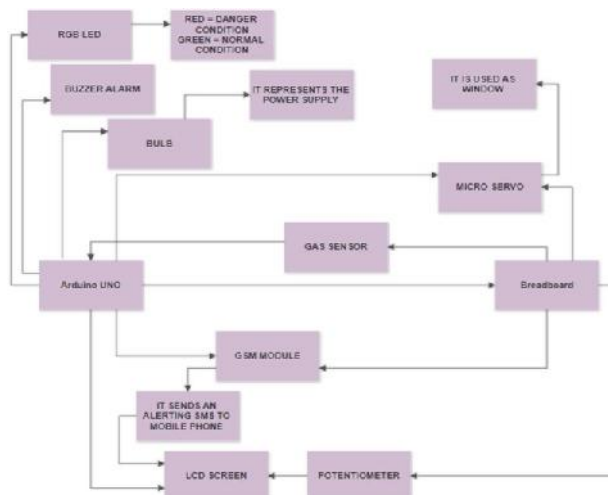**Figure1.CircuitDesign**

IV. Methodology:

Themodelstartsbytakingthepowersupplybythe Arduino to the breadboard so that we can add the positive and negative terminal to the breadboard and we have connected the GND pin to the negative part of the breadboard.

Itwillactivateallthecomponentsthatareattached in the system. The system has an Arduino, breadboard, gas sensor (MQ SERIES), LCD display, buzzer, RGB LED and also there is a power cut at the time of leakage. So that there is less chance of fire catching incidence ofLPG gas.

Figure2. Components Used in the design of system

After setting up the connection between the breadboard and Arduino weattached a Gas sensor andconnectedA2pintoanalogpinofArduinoand connected the H1, A1 pin to ground along with it B1,H2,B2withthepositiveendofthebreadboard in order to work. Connected with the analog pin since we require an output from a sensor which is going to be an input for the Arduino and thus the Arduino can perform the specific task assigned in the coding section through the digital pins.

NowwewishtoaddanLCDdisplayfordisplaying the messages according to the conditions to do so we have to make a connection between the LCD and Arduino by using the data pins of the LCD to the digitalpins ofthe Arduino. After that we have to make a connection between the LCD and the Breadboard starting with the power supply and ground pins (one of them is LED Cathode). The LED Anodeto be connected withthe positive part ofbreadboardandREAD/WRITEgroundedatlast connectedthecontrastpinwiththeWiperterminal of the potentiometer so that LCD will work accordingly, now supply power and ground the other pin for the potentiometer.

Atthisstagewehaveestablishedamodelwhichis capable of detecting and displaying the gas condition. In the coding part we have added a threshold limit so that when the gas is measured above threshold then the screen will display "WARNING LPG LEAKAGE" and at the normal condition the sensor will display "ALL CLEAR" message.

Let us now add some more alerting systems to it. Starting straight away with piezo as it is a very basic requirement for an alerting system like this. We connect the negative terminalofthe piezo,the GNDpinandthepositiveterminalwithpinD6and we make our code so that if a certain limit is crossed then the alarm starts ringing and remains quite in normal condition. In the coding part we have added the tone,the loudnessand the time for whichthebuzzer isindicatingthedanger.Another thing added through the coding part is that the buzzer turns louder and louder till the model gets back in the normal condition.

Another indicationistheRGB led light inorderto minimizetheuseofseveralLEDsatatimewehave usedRGBLED.Theoutcomewewantisthatgreen

LED to glow in normal condition and red LED to blink in danger condition. For that we have connectedgroundterminaltoGNDofArduinoand for red LED we have selected the pin D10 along with a resistance of 120   as we want the LED to blinkand forthegreenLED,wehaveusedpinD9 along with a resistance of 220   so that it glows constantly and in the coding part we have used these LEDs as per the situation if it is danger then wehavemadetheredLEDinhighmodeandgreen in low mode and vice versa for the danger condition.
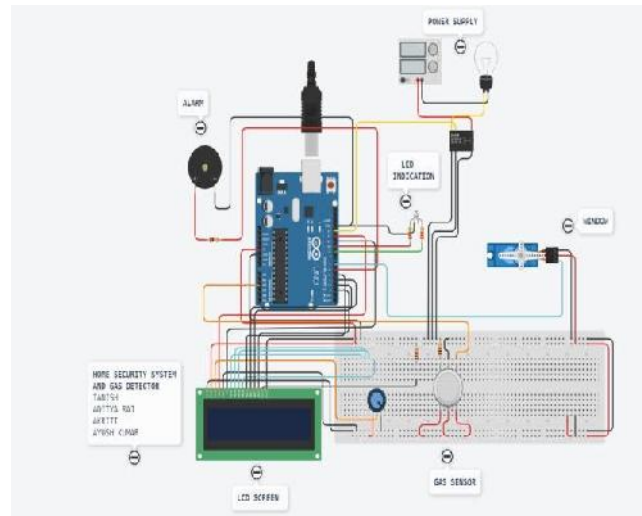
Figure3.CircuitDiagram

FutureScope:

Asthemodelisacompilationofnumerousalerting and security operations it can be used in homes, companiesand manyother places instead ofusing many alerting or security measurements.

Itcanbeusedduetosomesalientfeatures:-

1) FastSpeedofresponse.

2) Immunetocatalyticpoisons.

3) HighReliability& Repeatability.

4) Heatedopticseliminatescondensation.

5) Ability to operate in the absence of oxygen or enriched oxygen.

Conclusion:

After this project performance can conclude that the detection, alerting and securityofthe LPG gas leakage is an incredible compilation in the project system. Applicable usefully for industrial and domesticpurposes.Indangeroussituations,wecan save lives by using this system. An alert is indicated by the GSM module, window is opened and power. A sensor node senses gas like CO2, oxygen, and propane. The estimated range of transmission and consumption of power is obtained. The simple procedures and Arduino UNO Microcontroller area were used to build the sensor.

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