LPG GAS DETECTOR

INDEX

ACKNOWLEDGEMENT

It gives me great sence of pleasure to present the report of the DESIGN PROJECT under taken during First year

We acknowledge the enormous assistance and excellent cooperation given by my respected MISS AKHILA V H who helped us a lot and contribute a lot during the development and designing of the product.

We also take the opportunity to acknowledge the contribution of ASST. PROFESSOR MR .ANURAG SIR

who helped us in solid works and cad lab and his fully supported and assistance during the development of the project.

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Last but not least ,We acknowledge my friends who helped me directly and indirectly for the success of the project.

ABSTRACT

This is a live real time project designed at low cost with high detect accuracy. It is easy to implement. This project is designed to the LPG gas leakages and to alert the users through Audio visual indications. This project is designed to detect the LPG and four other dangerous gases from the range 200(ppm) to 10,000(ppm). A buzzer is connected to produce audible alert signal. The LPG Gas sensor can be used to make wireless gas leakage detector in home security system.

INTRODUCTION

The use of liquefied petroleum gas (LPG) is rapidly increasing in developing countries like Nigeria, India, Bangladesh, Nepal, South Africa as It produces low smoke and less soot. The LPG is a flammable mixture of hydrocarbon gases like propane and but Gas pipelines are safe but they are prone to gas leakage due to mishandling, accidents and over filling of the gas cylinder. Explosions resulting from domestic cooking gas leakage can be fatal causing loss of property and injuries or even deaths. A number of research papers have been published on gas to leakage security system in which gas sensors are used to detect gas leakage and a response circuit is caused to initiate an alert procedure and/or take action to avert an incident.Our method not only detects gas leakage but also beep .Apart from LPG,it can also detect gas nad alcohol.Therefore it is a multipurpose leakage detector.

COMPONENTS REQUIRED

SemiConductors

IC1 LM358 dual op amp

IC2 NE555 timer

IC3 BC547 npn transistor

Resistors

R1 10kilo ohm

R2 4.7kilo ohm

R3 220 kilo ohm

R4 1 kilo ohm

R5 56 kilo ohm

VR1 10-kilo ohm potmeter

Capacitors

C1 00micro Farad

C2 0.047micro Farad

C3 0.01micro Farad

C4 47micro Farad

Sensors

MQ2

MQ3

MQ6

Fig. 1 MQ2

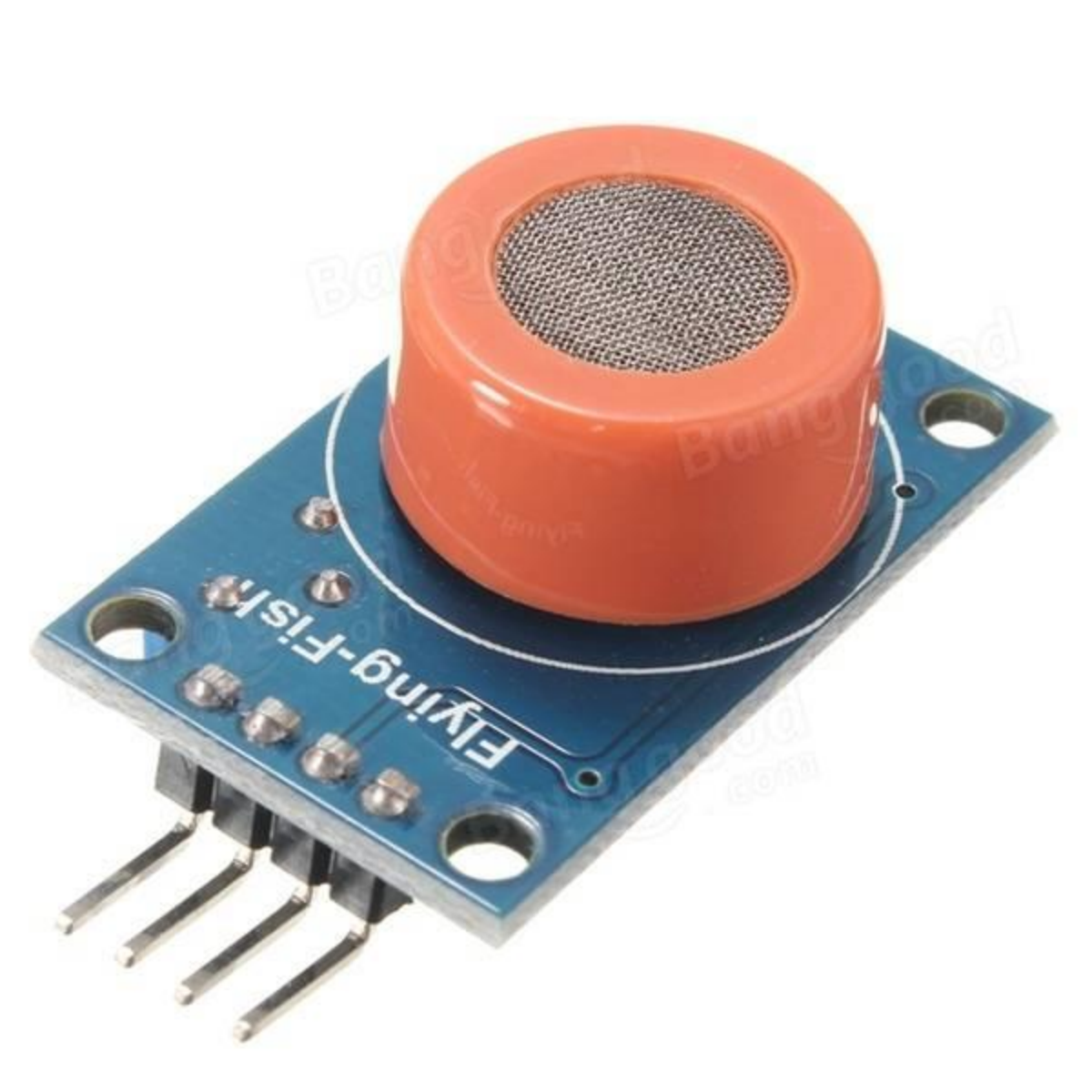


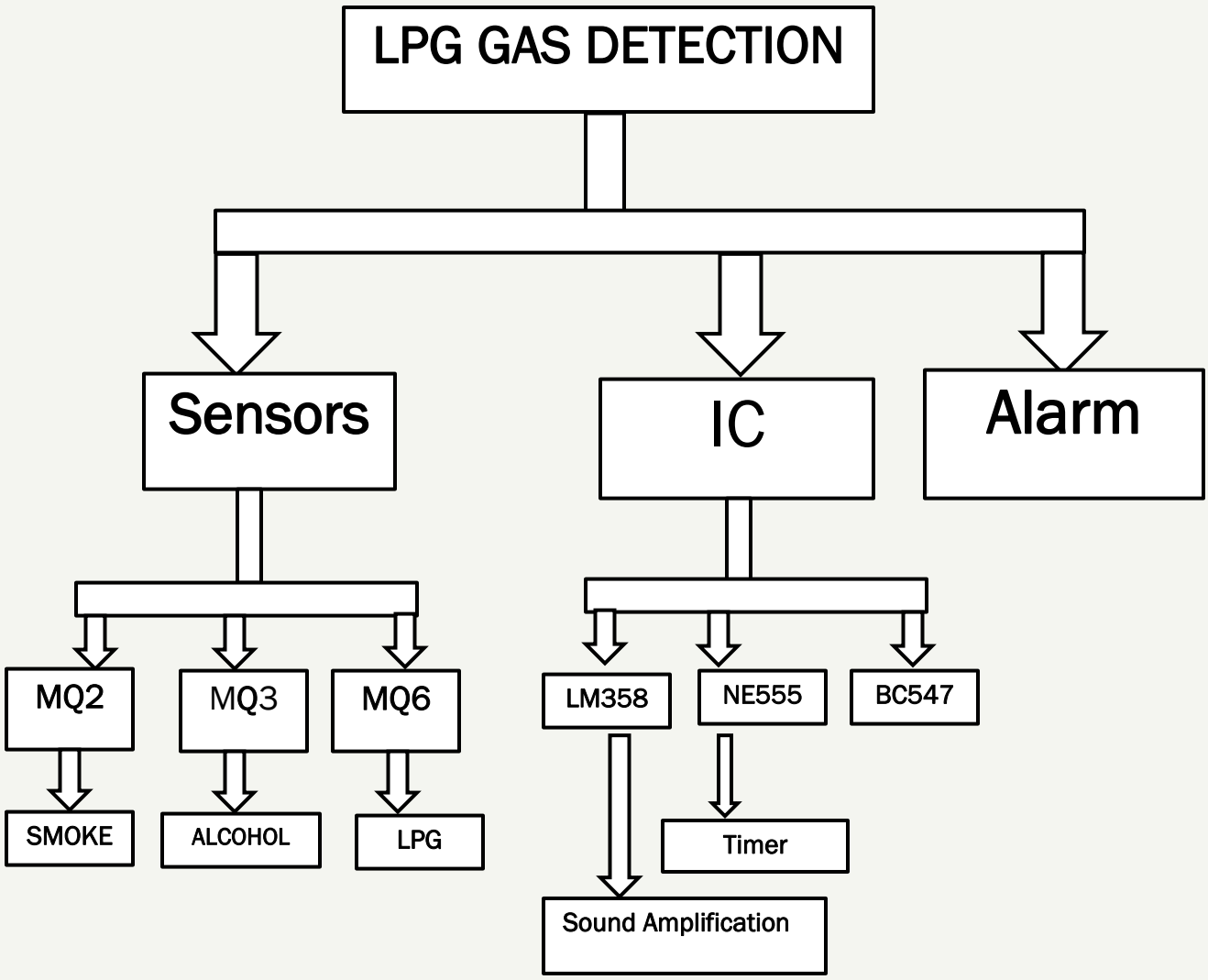
Fig.2 MQ1

Fig.3 MQ6

FEATURES

- Uses the MQ-6 LPG Gas Sensor
- Onboard Pot for threshold setting
- On board microcontroller
- This sensor has a fast response time
- Good sensitivity to Combustible gas in wide range
- Long life and low cost Simple drive circuit
- High sensitivity to Propane, Butane and LPG

MEANS TREE


LPG GAS DETECTION
Sensors
IC
Alarm
MQ2
MQ3
MQ6
LM358
NE555
BC547
SMOKE
ALCOHOL
LPG
Timer
Sound Amplification

DESIGN SPACE

M Means / Functions		
Smoke detecting	MQ2 Sensor	NE555
Alcohol detecting	MQ3 Sensor	
LPG detecting	MQ6 Sensor	
Temperature detecting	LM358	

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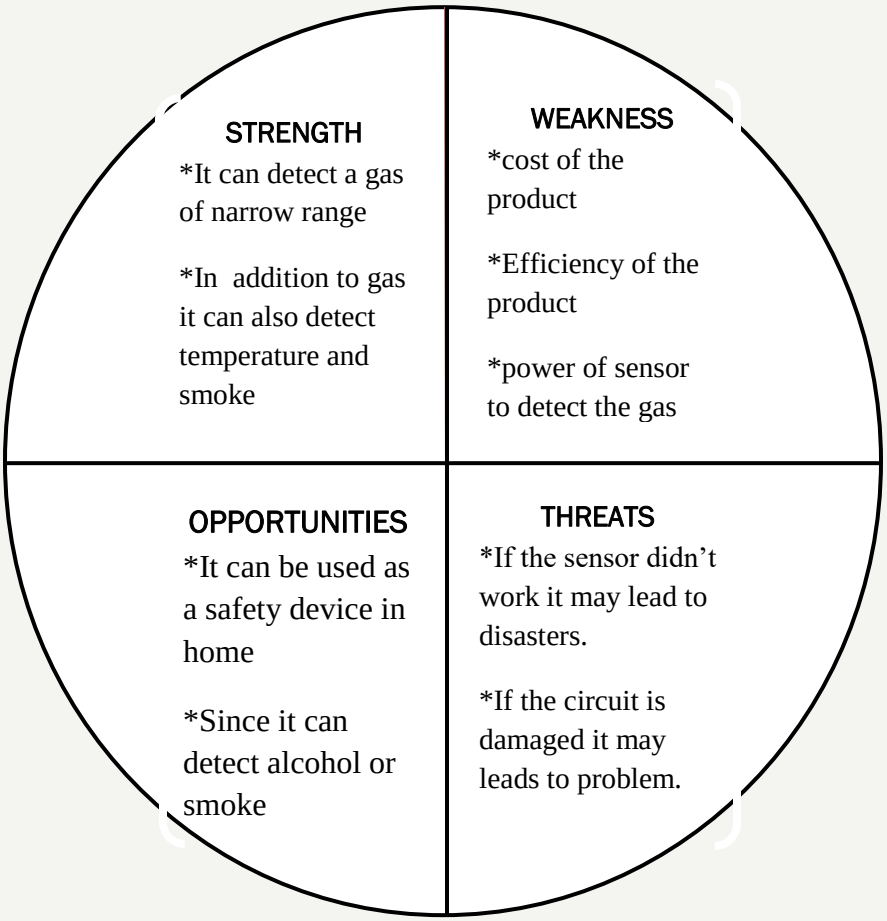

WORKING

In our approach, leak detection module consists of MQ-6 gas sensor to detect amount of combustible gas present in the surrounding.It then develops a gas detection and response system that detects gas leakage and automatically sounds an alarm. It is focused on managing cylinder gas supply used in domestic household cooking in the kitchen to minimize accidents due to gas leakages.Similarly MQ2 and MQ3 sensors detect the presence of alcohol or smoke from surroundings. It then develops a gas detection and response system that detects gas leakage and automatically sounds an alarm.

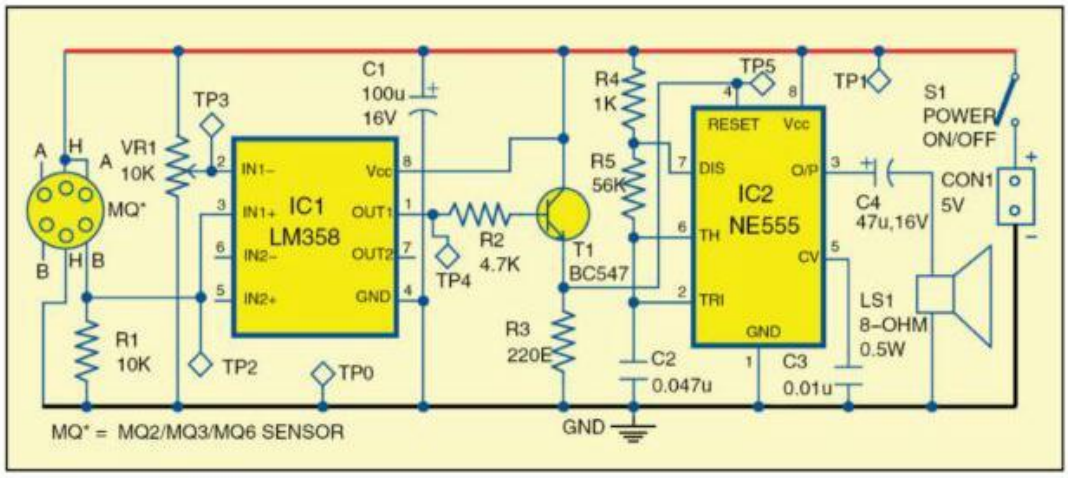

Fig. 1: Circuit diagram of the alarm circuit

Fig.4

ADVANTAGES

*It can detect a gas of narrow range

*In addition to gas it can also detect temperature and smoke

*It can be used as a safety device

*It can be therefore be used for multipurpose in home hotels etc

DISADVANTAGES

*cost of the product

*Efficiency of the product

*power of sensor to detect the gas /smoke

*Product should be analysed every 2 months.

THREAT

*If the sensor didn’t work it may lead to disasters.

*If the circuit is damaged it may leads to problem.

*Electrical shocks are possible to happen.

DESIGN METHODOLOGY

In this work a sensor capable of detecting the presence of gas in the air .To avoid increasing the gas concentration which will hasten fire incidents, supply of gas to the burner must be proper, if it is not then it should alert the owner of the status of the gas cooking system, an alarm must beep.

A. Block Diagram B. Circuit Diagram C. The Design of the Control Unit

The control unit receives signal from the gas detector sensor and then sends signal to the solenoid valve drive unit and then activate an alarm.

In this project we have used MQ-6 gas sensor. Whenever LPG gas is leaked the sensor detects and it passes signal to timer circuit. Here we have used IC 555 timer which acts as astable multivibrator.Then it will be given to Transistor driver circuit which activates buzzer and alerts the user through audio-visual indications.

RESULTS & DISCUSSION

Testing was carried out by releasing LPG into the atmosphere around the sensor. The gas detector and response unit are there to detect it. The results of test carried out on the device at different times and days for concentration of gas in the air around the sensor. The last four

values is the case of an endless loop due to high gas concentration. The device was tested placing the LPG device at different distances from the gas source. It was observed that when the LPG device was test by placing it at different distances from the gas source, the response time of the LPG system decreased as the distance from the gas source increased. Also it was observed that the sensitivity of the gas sensor was very high in clean air. The gas sensor sensitivity varied with temperature while the reference voltage remained constant over time. At constant gas concentration, the sensed voltage will always be constant. The gas sensor has a very fast response to gas since the time difference between test results with same concentration is very small while the difference between the sensed voltages is very high.

USES

*It can be used as a safety device in home

*Since it can detect alcohol or smoke

It can be used in bars and hotels

*With powerful sensors we can extend its use

CONCLUSION

A device that can detect such leakages and shuts off the gas supply to the burner from the cylinder was designed and developed. It was

observed that when the LPG device was tested by placing it at different distances from the gas source, the response time of the LPG system decreased as the distance from the gas source increased and vice versa. The gas sensor's sensitivity varied with temperature while the reference voltage remained constant over time. This device can be deployed any where cooking place or in kitchen.This system will ensure that explosions resulting from leakages of cooking gas from the cylinders are averted.

FUTURE WORKS

*A modified system which can alert as well as automatically switch of the leakage can be constructed

* The product is designed in such a way that it can give alert signals to the owners as well as the persons whose numbers are inserted in the product

*Chemical resistance circuit can be prepared

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