

LPG Gas Sensor

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Abstract— LPG gas is supplied in pressurized steel cylinder . As this gas is heavier than air, when it Leaks from a cylinder it flows along floor and tends to settle in low spots such as a basement. This can cause fire or suffocation if not dealt with. Here is a circuit that detects the leakage of LPG gas and alerts the user through audio-visual indication .This LPG gas sensor (MQ6), ideal sensor for use to detect the presence of dangerous liquefied petroleum gas (LPG) and it has high sensitivity to propane, butane, isobutene, natural gas. The sensor can also be used to detect combustible gases, especially methane. This circuit can detect leakages in your home, car or in a service station, storage tank environment. This unit can be easily implemented to industrial level by upgrading its range. This project is designed to detect the LPG from 200 parts per million (PPM) to 10000(PPM). Whenever there is LPG concentration of 100ppm in the area, the OUT pin of the sensor module goes high .This signal drives timer IC555, which is wired as an a stable multi vibrator .The multi vibrator basically works as a tone generator .This LPG gas sensor can be used to make wireless gas leak detection in home security system .The LPG Gas Sensor Module is designed to enable LPG detection interface to microcontroller without ADC Channels. By providing a GSM modem we can receive “SMS ALERTS” also.

Index Terms— IC 555,SEN-1327 gas sensor ,ON/OFF Switch and connecting wires

I. INTRODUCTION

An LPG gas sensor is a one kind device which is used sense the presence of a hazardous LPG gas leak in service station, cars, storage tanks and homes .This sensor is attached to a alarm circuit to give an alert to the operators through a buzzer sound in the area where the gas leak is occurring. The LPG gas sensor is also used to detect cigarette smoke, toxic gases, combustibile,propane ,iso-butane and LNG.

Nowadays, security is the major problem in many fields due to robberies, fire accidents and blasts due to LPG gas leakage. At present, LPG gas can used in the car, the storage tank or service station. But , due to some reasons the LPG gas might leak from the gas cylinders ,this may cause the cylinder blast, damage the house risk of a life to the living persons in the house. The fire ignite can be occurred due to many reasons such as an electrical short circuit, oil lamps or candles kept inside the house. Sometimes fire accidents are very small, but if proper action is not taken to control the fire accidents are very small, but if proper action is not taken to control the fire, then it can spread in complete house. To overcome this problem, an LPG gas sensor is used to detect the presence of a dangerous LPG gas leak in various places.

II. BLOCK DIAGRAM

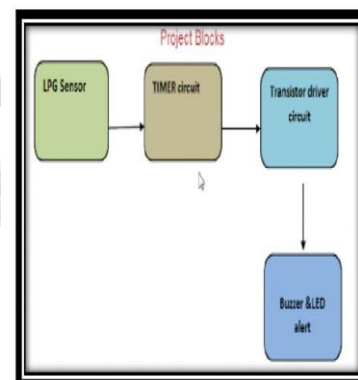


FIG- 1

[A] LPG SENSOR [MQ-6]



FIG-2

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This is a simple-to-use liquefied petroleum gas (LPG) sensor, suitable for sensing LPG (composed of mostly propane and butane) concentrations in the air. The MQ-6 can detect gas concentrations anywhere from 200 to 10000ppm.

This sensor has a high sensitivity and fast response time. The sensor's output is an analog resistance. The drive circuit is very simple; all you need to do is power the heater coil with 5V, add a load resistance, and connect the output to an ADC.

This sensor comes in a package similar to our MQ-3 alcohol sensor, and can be used with the breakout board below.

[B] TIMMER CIRCUIT [555 TIMER CIRCUIT]

The 555 timer IC is an integrated circuit (chip) used in a variety of timer, pulse generation and oscillator application. The 555 can be used to provide time delays, as an oscillator and as a flip-flop element. Derivatives provide two or four timing circuit in one package.

The IC 555 has three operating modes:

- 1: BISTABLE
- 2: MONOSTABLE
- 3: ASTABLE

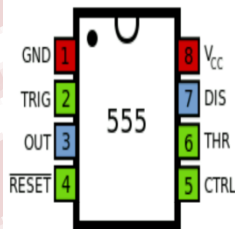


FIG -3

Pin Name	Purpose
1 GND	Ground reference voltage, low level (0 V)
2 TRIG	The OUT pin goes high and a timing interval starts when this input falls below 1/2 of CTRL voltage (which is typically 1/3 V _{CC} , CTRL being 2/3 V _{CC} by default if CTRL is left open). More simply we can say that OUT will be high as long as the trigger is kept at low voltage. Output of the timer totally depends upon the amplitude of the external trigger voltage applied to this pin.

3 OUT	This output is driven to approximately 1.7 V below +V _{CC} , or to GND.
4 $\overline{\text{RESET}}$	A timing interval may be reset by driving this input to GND, but the timing does not begin again until RESET rises above approximately 0.7 volts. Overrides TRIG which overrides THR.
5 CTRL	Provides "control" access to the internal voltage divider (by default, 2/3 V _{CC}).
6 THR	The timing (OUT high) interval ends when the voltage at THR ("threshold") is greater than that at CTRL (2/3 V _{CC} if CTRL is open).
7 DIS	Open collector output which may discharge a capacitor between intervals. In phase with output.
8 V _{CC}	Positive supply voltage, which is usually between 3 and 15 V depending on the variation.

[C] BUZZER

A buzzer or a beeper is an audio signaling device, which may be mechanical, electromechanical or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or keystroke.



FIG -4

[D] LED ALERTS



FIG-5

LED is a semiconductor device that converts electricity into light .LED lights are super energy efficient, using approximately 85% less energy than halogen

III. FLOW CHART

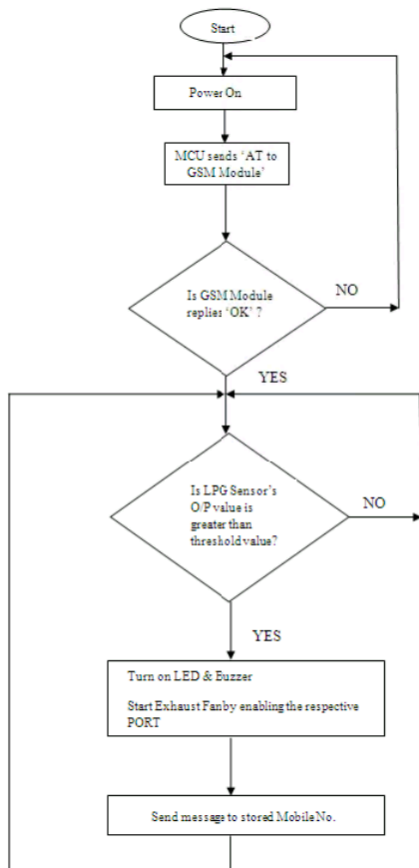


FIG -5

IV. SOFTWARE USED- PROTEUS

Proteus 8 is a best simulation software for various design with microcontroller. It is mainly popular because of availability of almost all microcontrollers in it. So it is a handy tool to test programs and embedded designs for electronics hobbyist. We can simulate our programming of microcontroller in PROTEUS 8 simulation software.

V. CONCLUSION

The mini project on gas sensor and alert system has been done successfully. By using Proteus software we can design the simulation diagram on proteus. In such a way this mini project is done successfully and tested. This project is very simple for using. Our daily life, there is more important role of LPG gas. This gas is used to make food in many industries, hospitals and hotels LPG gas is required. So the gas may leak anytime from the cylinder and it is very dangerous. Sometimes it may cause fire and death of people also occur. So, this simple cost-effective gas leakage detection system was used to detect leakage in gas. It is easy to use. Hence, this project is designed and implemented successfully.

VI. REFERENCES

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