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## Gas Leakage Detector

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### ABSTRACT

Gases such as LPG and CNG are used in residential, industrial areas and in vehicles every day as an alternative fuel to petrol and diesel. There are occurrences of major accidents around the world due to gas leakage. There were huge losses of lives and property due to those accidents. They could have been prevented if we had used the right technology at the right time. Gas leakage detector helps in efficiently detecting the leakage of gas and avoid risk of accidents by saving lives and property. In residential and industrial areas, a gas leakage is toxic and hazardous to people and industrial operations. A proactive detection and an alert would minimize the dangers caused by a gas leak.

Keywords: Arduino UNO, GSM Module 800A, LCD, LED and Buzzer.

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### 1 INTRODUCTION

LPG is a blend of commercial propane and butane. It also incorporates hydrocarbons which are highly ignitable. It is unscented. Hence, an odorant is added to recognize gas leakage. Ethanethiol, EN589, Amyl Mercaptane and Tetrahydrothiophene are commonly used as odorants. There is a possibility that a few people may have low smelling capacity. In such cases, high security frameworks have been developed to prevent accidents and loss of life.

Gas detection systems use a variety of sensors and electronic devices to detect potentially harmful gas leaks in that area. The device is low-cost and may be easily implemented within chemical companies and in residential areas that are surrounded by chemical industries or facilities.

In this design MQ-6 sensor is utilized to recognize and detect the gas spillage, it is fit for detecting LPG, iso-butane, propane, and CNG. This proposed framework is not just fit for detecting or identifying the gas spillages but also cautioning the concerned user about the gas spillage by audio-visual alert and sending SMS to the client. The yield of the sensor goes LOW when the LPG sensor detects any gas spillage. This is recognized by the microcontroller and the LED and Buzzer are turned ON.

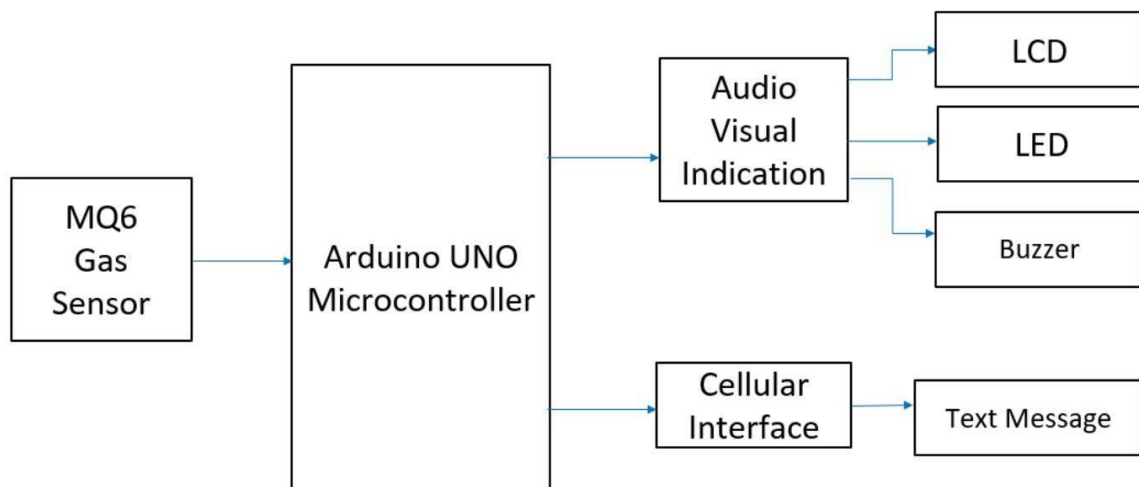
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### 2.Literature Survey

[1] Proposed a framework in which gas spillage is recognized by the MQ5 sensor. Later it conveys a message to the concerned to inform about the spillage of gas.

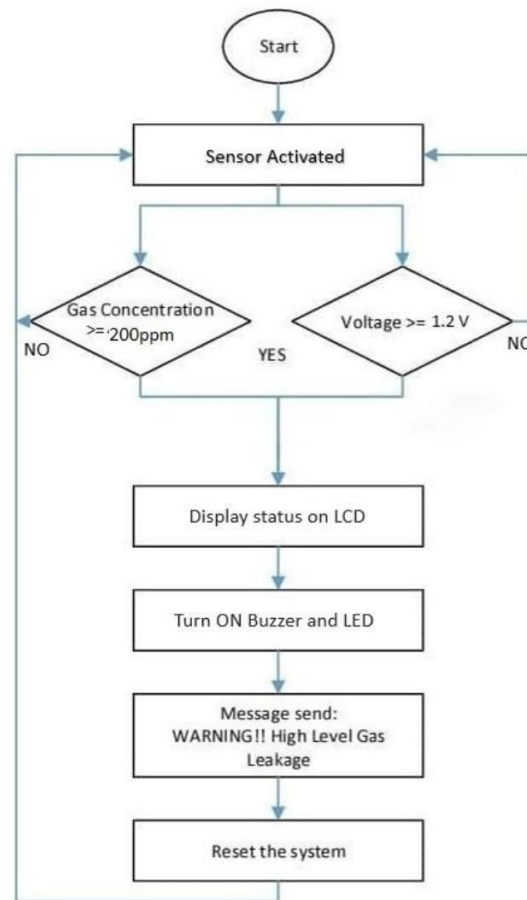
- [2] Proposed the device wherein of LPG and CNG are detected for residential and automobile safety.
- [3] Proposed the gas spillage detection and constant checking of the gas chamber. The gas spillage is constrained by the usage of an exhaust.
- [4] The proposed system is to recognize the spillage of the LPG by a gas sensor and utilizes the GSM to caution individuals about the gas spillage through SMS.
- [5] Proposed a framework in which the degree of LPG in the chamber is checked and the level of gas shown. In case there is any spillage, it is identified by an audio visual alarm.
- [6] This system detects Gas Leakage using MQ-5 Sensor. Then sets up an SMS based Alert Mechanism and send 3 SMS to 2 specified mobile numbers. Later, produces an alarm sound upon gas leak and stops the alarm once gas leak is under control. Display status in an LCD module.
- [7] The system detects gas above 2000ppm. It sent an SMS via GSM Module to the concerned user. It also alerts the surrounding via buzzer and displays the leakage message on the LCD.
- [8] The project has a system which uses IoT. Gas leakage is detected and an audio -visual alarm is used to indicate it. An SMS is sent to the user about the weight of the gas cylinder via Wi-Fi module.
- [9] In this framework gas spillage is partitioned into two levels, LOW and HIGH. At the point when sensor close to chamber detects the spillage, it implies LOW level and when the sensor far away from chamber recognize the spillage, it implies HIGH amount of gas is detected .
- [10] The system proposed, uses IoT. An alert is sent to the user on twitter. Cloud storage is used for sending the notifications

### 3.Working



The Gas leakage detector consists of the MQ-6 gas sensor which has a coating of SnO<sub>2</sub>. The coating is sensitive to propane and butane. The leaked LPG is detected in the sensor. The sensor is connected to the Arduino UNO. The Arduino UNO consists of the ATmega328P Microcontroller. The microcontroller receives the signal from the sensor when the gas level goes above 200 ppm. This signal is transmitted to the external devices. The buzzer rings until the gas level goes below 200 ppm. The LED blinks. The 16x2 LCD displays the amount of gas detected in ppm and shows the message that an SMS has been sent to the concerned user through the GSM 800A Module.

#### 4. Methodology



In the proposed system, the sensor is in an activated state. The sensor can detect gas in the range of 100 - 1000ppm. When the gas detected is more than 200 ppm, there is a change in the potential difference, and it becomes more than 1.2 V. Then, a signal is sent to the microcontroller from the sensor. That signal is transmitted to the external devices. These external devices are LED, LCD, Buzzer and GSM Module. When the signal is transmitted, the LED is turned ON, the buzzer is activated, and a sound is produced. The GSM Module sends SMS to the concerned user regarding the gas leakage. The LCD module shows the gas concentration detected and displays the message indicating that the SMS has been sent.

#### 5. Conclusion

The prototype detects the gas leakage via MQ6 sensor, and sends a signal to the microcontroller. Which is then transmitted to the external devices. The system can be improved by the usage of relay to turn off the main power supply. The risk of burst is reduced. An exhaust can also be added to reduce the gas leakage and make it less hazardous.

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