A project Based Lab Report

On

DETECTION OF GAS AND SMOKE LEAKAGE AND AUTOMATIC ALERT SYSTEM USING ARDUINO

SUBMITTED BY:

GROUP 7

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ABSTRACT

This Project describes gas and smoke leakage detection system using Arduino. Gas and smoke leakage is common phenomena around the world and is causing millions of accidents every day.

This system can prevent these accidents and aware the people nearby. The buzzer included in the system starts buzzing whenever there is more gas or smoke present than usual. The LCD display will show the gas or smoke level. This device can be one of the best solution to overcome such accidents.

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INTRODUCTION

The usage of the gas and fire brings great problems in the domestic as well as working places. The inflammable gas such as Liquidized petroleum gas (LPG), which is excessively used in the house and at work places. The leakage of the gas causes destructible impact to the lives and as well as to the heritage of the people. So, by keeping it in the concept of the project we have determined to develop an examining system which finds the leak of LPG gas and smoke caused by fire and protects the work places by taken correct precaution at correct time. This system provides the alert when a gas leakage is noticed, sensors of in the project are used to notice the gas leakage and immediately turns on the buzzer for the danger indication. Buzzer is a clear indication of gas leakage. By the detection of the hazardous gas or smoke the value of the smoke or gas level is shown on the display. The main objective of this project is to provide accurate gas detection and alert to make the household safer at comparatively cheaper price.

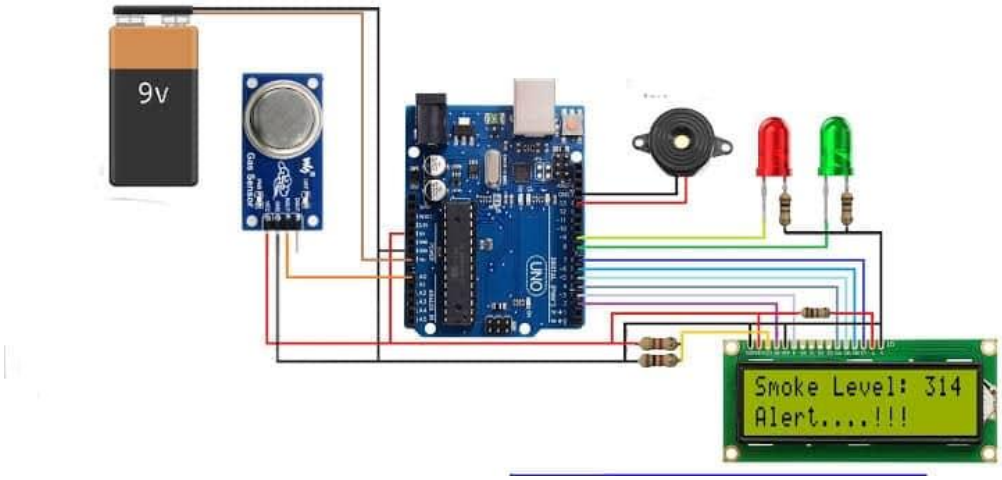
COMPONENTS

Component Name	**Amount**
Arduino Uno	1
Alphanumeric LCD (16x2)	1
5 mm LED: Red	1
5 mm LED: Green	1
Analog LPG Gas Sensor (MQ5)	1
Buzzer	1
9V Battery	1
4.7k Resistor	1
1k Resistor	1
Jumper Wires	30
Breadboard	1
100 Ohm Resistor	3

METHODOLOGY

Arduino UNO (Atmega-328) is the main unit of the system which performs the following tasks.

A signal conditioning of the Arduino UNO is done by output signal of the sensor, provided input to Arduino. The gas sensor is MQ-5. It can detect H2, LPG, CH4, CO, Alcohol. It's Aout pin is connected with A0 of Arduino. 2 LED lights (green & red) are connected with Arduino (8 & 9 pin accordingly) while another pin of each led is connected with lcd K pin. The detection results displayed on LCD. LCD & Arduino are directly connected with pins D7, D6, D5, D4, E & RS pins. LCD is connected with MQ-5 via resistors (1K & 4.7K). A buzzer is attached with Arduino to 13 & GND pin. MQ-5 detects the gas & smoke level in analog form to the Arduino UNO.



Circuit Connection

Arduino send its digital form to the buzzer (which will make sound when gas level arises), LCD (which shows the resultant level of gas) and LED (which lights as levels).

FLOW DIAGRAM

Flow diagram of our gas and smoke detection system is shown below-

OUTCOME

Normal State

Gas Leakage State

In case of gas leakage & smoke, the buzzer starts giving alert, and red LED glows and the gas value is displayed on the LCD.

APPLICATION

This Arduino based gas and smoke detection system can be mounted anywhere where there is chance of fire or gas leakage. Buzzer is used to alert people nearby if there is excessive gas or smoke in the atmosphere. The reading of the LCD display can be used to monitor the environment which can be useful in factories and mills. The system can be powered using a 9V battery which is available in market. The components used in this system is cheap and easily available in market. So, if anything malfunctions, it is easily replaceable which makes this system highly useful in household as well.

CONTRIBUTION

Contribution of each member is shown below:

Member ID	**Contribution**
202014067	• Component Selection • Report Writing • Circuit Connection
202014034	• Arduino Programming • Circuit Connection • Project Decoration
202014036	• Arduino Programming • Circuit Connection • Project Decoration

CONCLUSION

After this project performance, can conclude that detection of the gas and smoke leakage is successful in the project system. Applicable usefully in the industrial and domestic purpose. In danger situations we are able to save the life by using this system. An alert is indicated by the buzzer and LED. A sensor node senses gas like H_2, LPG, CH_4, Smoke etc. The estimated range of transmission and consumption of power is obtained. The simple procedures and Arduino UNO Micro controller area used to build the sensor.