

LPG Gas Detection And Alert System

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Abstract :The presence of hazardous LPG gas leakage in a domestic, work place, also, stored gases container gas which exhibits ideal characteristic is use. For that sake, an alarm unit is used to vibrate an alarm which is buzzer. Buzzer gives an audible sign of the presence of LPG volume. The sensors are widely used to detect essence of propane, iso-butane, LPG and even smoke. The sensor has an advantage to combine a sensitivity response time. If the LPG sensor senses gas leak from work place or home, sensor output goes to active low (logic-0) condition. Arduino UNO is used in the project; low signals are overlooked by the Arduino and gas leakage is been noticed by the Arduino. The Arduino UNO turns on the LCD and buzzer. It even turns on the GSM modem after that, it continues to send messages SMS to mobile number specifically mentioned in the program of the source code for alerting danger to the people.

INTRODUCTION

- I. Gas leakage leads to various accidents resulting in both material loss and human injuries. The risk of explosion, firing, suffocation are based on their physical properties such toxicity, flammability, etc.
- II. The number of deaths due to explosion of gas cylinders has been increasing in recent years. The reason for such explosion is due to substandard cylinders, old valves, worn out regulators and lack of awareness in handling gas cylinders.
- III. The LPG or propane is a flammable mixture of hydrocarbon gases used as fuel in many applications like homes, hostels, industries, automobiles, vehicles because of its desirable properties which include high calorific value, less smoke, less soot, and meager harm to the environment.
- IV. Natural gas is another widely used fuel in homes. Both gases burns to produce clean energy, however there is a serious problem of their leakage. Being heavier than air, these gases do not disperse easily. It may lead to suffocation when inhaled and may lead to explosion .
- V.
- VI. Due to the explosion of LPG, the number of deaths has been increased in recent years. To avoid this problem there is a need for a system to detect the leakage of LPG. Gas leak detection is the process of identifying potentially hazardous gas leaks by means of various sensors.

LITERATURE REVIEW

A. Existing Systems

A gas detector is a device that detects the presence of gas in an area, often as a part of safety system. This type of equipment is used to detect gas leak or other emissions and can interface with a control system so a process can automatically shut down. A gas detector can sound an alarm to operators in the area where the leak is occurring, giving them opportunity to alert. These types of devices are important because there are many harmful gases that can be harmful to organic life such as humans and animals. Gas detectors can be used to detect flame-able, combustible and toxic gases and oxygen depletion. This type of device is widely used in industry and can be found in locations such as oil rigs, to monitor manufacture process and emerging technologies such as photovoltaic. Gas leak detection methods become concern after the affects of harmful gases on human health is discovered. Before modern electronic sensors

Their use in automobiles was initially for engine emission control, but now gas sensors may also be used ensure passenger comfort and safety. Carbon dioxide sensors are being installed into buildings as part of demand control ventilation systems. Sophisticated gas sensor systems are being researched for use in medical diagnostic, monitoring and treatment system, well beyond their initial use in operating rooms. Gas monitors and alarms for carbon monoxide and other harmful gases are increasingly available for office and domestic use, and are becoming legally required in some jurisdictions

early detection methods relied on less precise detectors. Though the 19 and 20th centuries coal miners would bring canaries down to the tunnels with them as an early detection system against life-threatening gases such as carbon dioxide, carbon monoxide and methane.. The first gas detector in industrial age was the safety lamp or day lamp was invented by Humpohry Davy (of England) in 1815 to detect the presence of methane gas in the underground coal mines. The flame safety lamp consisted of an oil flame adjusted to specific height in the fresh air. To prevent ignition with the lamps flame was contained within a glass sleeve with a mesh flame arrestor. The flames height varied depending on the presence of methane or the lack of the oxygen

Issues with current Systems

The user is required to physically interact with the communication-based hardware and is also required to open the gas knob themselves as well, these systems seem like they are complicating something which isn't that complicated.

Thus, the problem with existing systems is still the major amount of user interaction that is required.

B. Problem Statement

LPG gas cylinders are used in our homes for various purposes.detection .

Cooking and heating water are a major part of the same. Hence it would not be wrong to say that it is an integral part of our life. However, there have been cases in the past about accidents due to gas leakage The basic objective of the project is to provide a security system to prevent a caused due to the leakage of gas This can be achieved by creating a ready standalone system of the same..

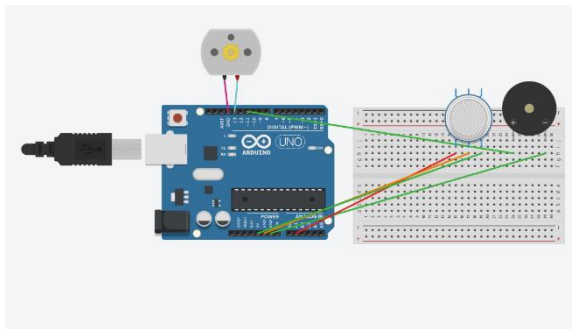
VII. PROPOSED SYSTEM

A signal conditioning of the Arduino UNO is done by output signal of the sensor, provided input to Arduino. Indicates the people of danger in work place, factory, home. Buzzer activity with beep(siren) sound is made amount of heat.

Following Components will be used:

LPG Detection System

- Arduino Uno
- MQ-2 Sensor
- Buzzer
- Jumper wires
- Exhaust Fan
- Bread board



**Fig 3.2 Architecture of
LPG gas
detector
system**

The system consists of MQ-2 gas sensor which will in turn sense the gas, and send alert to the Arduino uno. Once the alert is sent, the buzzer will turn on and the exhaust fan will start rotating in order to remove the gas in the air out of the room.

Information about the components:

Hardware:

LPG gas detection System:

- Arduino Uno
Arduino/Genuino Uno is a microcontroller board based on the ATmega328P ([datasheet](#)). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button
- Buzzer
A buzzer or beeper is an audio signaling device, which maybe 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.
- Jumper wires
A jump wire is an electrical wire, or group of them in a cable, with a connector or pin at each end, which is normally used to interconnect the components of a breadboard or other prototype or test circuit, internally or with other equipment or components, without soldering
- Breadboard
A breadboard, or protoboard, is a construction base for prototyping of electronics

Fig . Block Diagram of LPG gas Detector System

With this system we make sure that the user/owner doesn't have to be present at the door personally to open it.

The flowchart also puts the working into a diagrammatical view and helps in understanding the process through which the proposed system will work. Attached below is the flowchart.

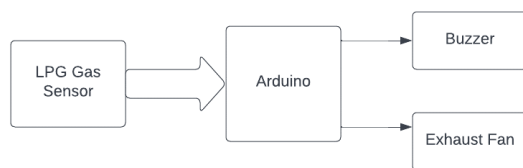
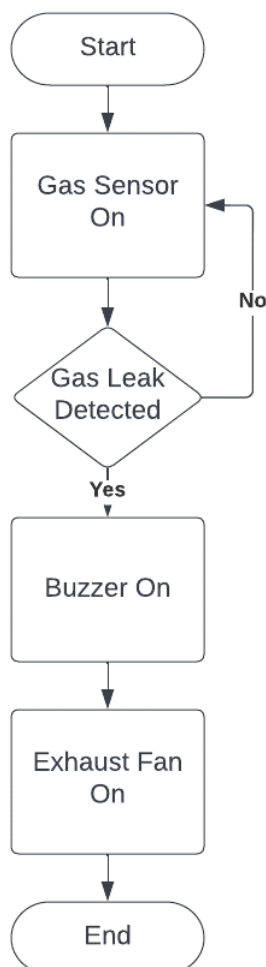


Fig. Flow Chart Of the System



Software:

- **Arduino IDE**

It is an open-source software which helps to write and upload the code on the board. This software can be used with any Arduino board.

Working

I. Arduino Uno is a open-source microcontroller board based on the ATmega328p microcontroller.

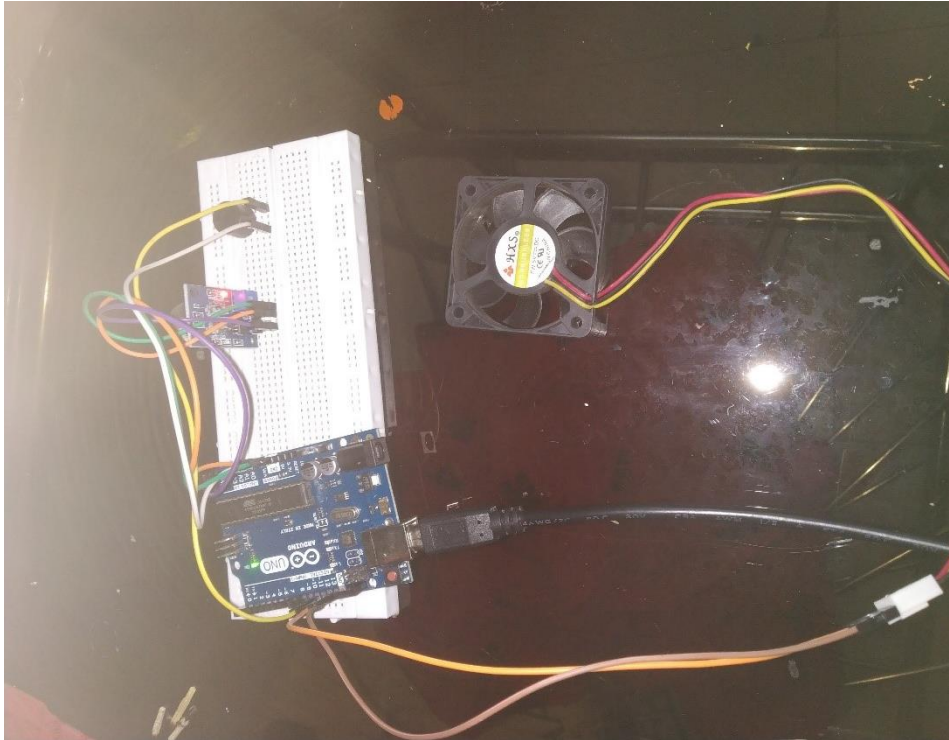
II. The gas sensor detects the presence of lpg gas emitted by the gas cylinder. It gives logic 1 as output if gas is detected, otherwise, it gives logic 0 as output.

Arduino Uno checks the logic level on the output pin of the sensor and performs further tasks such as activating the buzzer and exhaust fan.

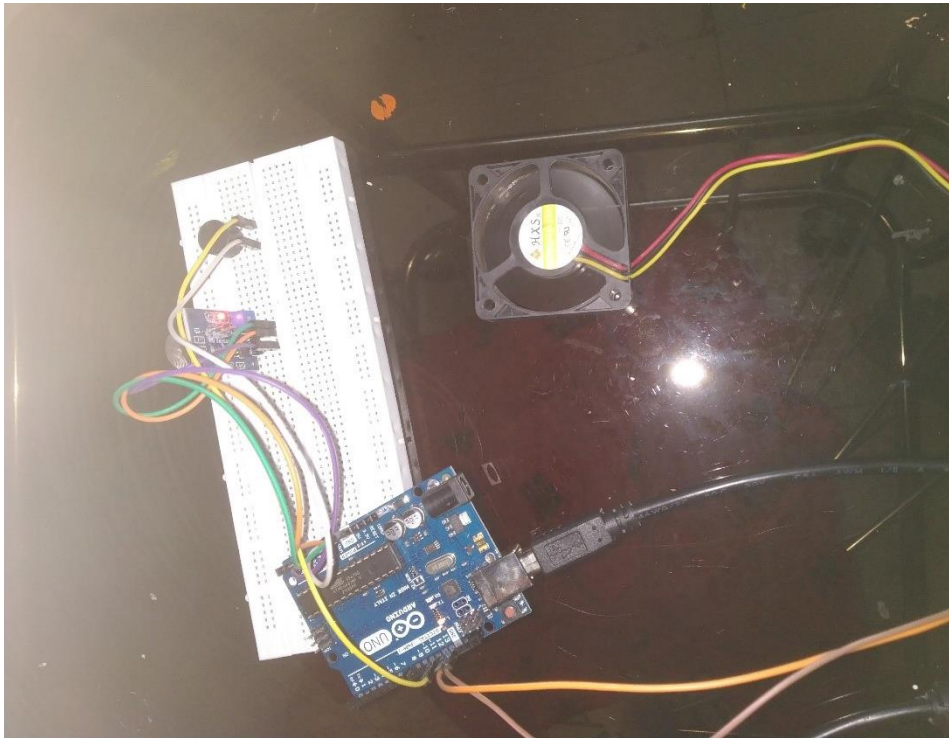
III. The system consists of MQ-2 gas sensor which will in turn sense the gas, and send alert to the Arduino uno. Once the alert is sent, the buzzer will turn on and the exhaust fan will start rotating in order to remove the gas in the air out of the room

OUTPUT:

I. When No Gas Detected :



II. When Gas Detected



Conclusion:

Gas leakage leads to severe accidents resulting in material losses and human injuries.

Gas leakage occurs mainly due to poor maintenance of equipments and inadequate awareness of the people. Hence, LPG leakage detection is essential to prevent accidents and to save human lives. This report presented LPG leakage detection and alert system. This system triggers exhaust fan and buzzer to alert people when LPG leakage is detected. This system is very simple yet reliable.