**GAS LEAKAGE DETECTION & AUTO ON-OFF GAS SYSTEM**

This system helps you to upgrade your safety standards, comply statutory requirements on environmental commitments and most important and basic function being prevent accidents and protect life and property from disaster. In the past, it has been a conventional practice to employ combustion apparatus such as a furnace, heater, stove or LPG kit in cars, which utilizes a combustible vapor or gas to produce heat energy when properly ignited. In the use of combustible apparatus in which a combustible gas such as natural or liquid propane gas is burned in heating boilers, domestic water heaters, ovens, stoves and the like, the apparatus or appliance is generally of an automatic recycling type. That is to say, the equipment is generally in operation for short periods of time after which is shut down for a short period of time. The equipment has intermediate operation and the appliance is generally started and stopped at the signal of an automatic controller, such as a thermostat, which may be actuated by temperature, pressure, or the like. The LPG Kit installed is many times installed inside the car creating possibilities of large accidents. This type of appliance/Kits is normally unattended by any operating personnel, since it is automatic in operation and, therefore, one hazard encountered in the use of such an appliance is the possibility that during a standby period or a period in which it is not in operation, a gas leak may occur thereby resulting in a large accumulation of combustible gas which can produce an explosion if the detection is not quickly noticed. Although some sophisticated detector means have been provided, it is contemplated that the indicator means should be simple and economical so that the entire system may be readily incorporated into mobile trailers, campers, boats and other vehicles or living quarters having appliances dependent upon storage of pressurized gas.

**OBJECTIVES**

The primary objects of the present project to provide a novel means for safely detecting any malfunction of a pressurized gas system in order to prevent accumulation of combustible gases so that damage or explosion due to such an accumulation of gases is prevented.

Another object of the present invention is to provide a novel safety means for detecting the leakage of gas into the area of an appliance when the appliance is in a shutdown condition and not in operation. Yet another object of the present invention is to provide a novel gas detection and monitoring system which is economical to manufacture and which may be readily installed in conventional trailers, boats or the like which are normally dependent upon a stored supply of pressurized gas.

Typical installation areas being gas yards (Bullets), gas banks with multi cylinders in manifold, user production departments / utility areas like kitchens.
Ideal sensor for use to detect the presence of a dangerous LPG leak in your car or in a service station, storage tank environment. This unit can be easily incorporated into an alarm unit, to sound an alarm or give a visual indication of the LPG concentration. The sensor has excellent sensitivity combined with a quick response time. The sensor can also sense iso-butane, propane, LNG and cigarette smoke.

### APPLICATIONS

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<tr>
<th>Protection from any gas leakage in cars.</th>
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<td>For safety from gas leakage in heating gas fired appliances like boilers, domestic water heaters</td>
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<tr>
<td>For safety from gas leakage in Cooking gas fired appliances like ovens, stoves etc</td>
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<td>Large industries which uses gas as their production.</td>
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<td>They are used in gas leakage detecting equipments in family, Car and industry, are suitable for detecting of LPG, iso-butane, propane, LNG, avoid the noise of alcohol and cooking fumes and cigarette smoke.</td>
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### NOTE:

If the detected gas is LPG, Butane and propane which is heavier than normal air, Install the gas leak alarm about 1.00 meter above the ground, adversely, For the Natural gas, Methane, coal gas, and CO, which is lighter than the normal air, Install gas leak alarm about 1 meter below the roof, Both of them are should be with good air circulation.
In this circuit we used MQ-6 sensor for gas leakage detection. MQ-6 sensor composed by micro AL2O3 ceramic tube, Tin Dioxide (SnO2) sensitive layer, measuring electrode and heater are fixed into a crust made by plastic and stainless steel net. The heater provides necessary work conditions for work of sensitive components. The enveloped MQ-6 has 6 pin, 4 of them are used to fetch signals, and other 2 are used for providing heating current. Here MQ-6 sensor works on basics of combustion process, and output is given in variable voltage form, so, when LPG gas is leakage voltage at the output pin of MQ-6 is increased and we use IC2 (Op-amp LM324) as a comparator for compare the LPG leakage with respect to normal condition. Output of comparator is fed to IC1 microcontroller (ATMEL 89S8253) and corresponding coding LCD is display gas leakage and give another instruction to stepper motor via ULN2803 to turn 90° to turn off the regulator of gas tank. Temperature sensor DS18B20 is continuously communicated with Microcontroller and display temperature at LCD. If temperature is more than 50° then fire alarm is activated and display fire on LCD.

**MQ-6 GAS SENSOR:**
MQ-6 gas sensor composed by micro AL2O3 ceramic tube, Tin Dioxide (SnO2) sensitive layer, measuring electrode and heater are fixed into a crust made by plastic and stainless steel net. The heater provides necessary work conditions for work of
sensitive components. The enveloped MQ-6 has 6 pin, 4 of them are used to fetch signals, and other 2 are used for providing heating current.

**DISPLAY UNIT:** It is 16*2 LCD that shows the Tag ID number as instructed by the microcontroller.

**MICROCONTROLLER DETAILS:**

The microcontroller used here is a common 8 bit Atmel microcontroller AT89s8253. It is a low-power, high-performance CMOS 8-bit microcontroller with 12K bytes of In-System Programmable (ISP) Flash program memory and 2K bytes of EEPROM data memory. It has 32 programmable input output lines.

**FEATURES:**

- 12K Bytes of In-System Programmable (ISP) Flash Program Memory
  - SPI Serial Interface for Program Downloading
  - Endurance: 10,000 Write/Erase Cycles
- 2K Bytes EEPROM Data Memory
  - Endurance: 100,000 Write/Erase Cycles
- 2.7V to 5.5V Operating Range
- Fully Static Operation: 0 Hz to 24 MHz (in x1 and x2 Modes)
- Three-level Program Memory Lock
- 256 x 8-bit Internal RAM
- 32 Programmable I/O Lines
- Three 16-bit Timer / Counters
- Nine Interrupt Sources
- Enhanced UART Serial Port with Framing Error Detection and Automatic Address Recognition
- Enhanced SPI (Double Write/Read Buffered) Serial Interface
- Programmable Watchdog Timer
APPLICATIONS
- Gas leak detection system
- Fire/Safety detection system
- Gas leak alarm
- Gas detector

FEATURES
- High sensitivity LPG, iso-butane, propane
- Small sensitivity to alcohol, smoke
- Fast response
- Wide detection range
- Stable performance and long life
- Simple drive circuit

ADVANTAGE
- It is used in house as LPG leakage detection.
- It also detect alcohol so it is used as liquor tester.
- The sensor has excellent sensitivity combined with a quick response time.

DISADVANTAGES
It is little sensitive to smoke, then in kitchen it is not perfectly response for LPG gas leakage.
It work only when at 5V power supply is given.
Its sensitivity depends on Humidity and temperature.