ALCOHOL BREATH ANALYSER ALARM SYSTEM
INTRODUCTION

The main aim of this project is to design an electronic system for implementing an efficient alcohol detection system that will be useful to avoid accidents. There are many different types of accidents which occur in daily life. Accidents may cause due to many reasons it may be due to brake fail. Most often accidents occur due to over drunken person. Though there are laws to punish drunken drivers they cannot be fully implemented because traffic police cannot stand on every road to check each and every car driver whether he/she has drunk or not. This can be a major reason for accidents. So there is a need for an effective system to check drunken drivers. Therefore in order to avoid these accidents we have implemented a prototype project. In our project, initially we check whether the person has drunken or not by using the MQ3 GAS sensor. In this system, sensor circuit is used to detect whether the alcohol was consumed by driver or not. To this end, we have designed such a system that when alcohol concentration is detected alarm is raised.
Introduction to Alcohol Sensor

The onboard Alcohol Sensor (MQ-3) provides the Alcohol contents in the air. If this found above set PPM value then it will inform the Host controller by pulling the Digital Output Pin to High and onboard status LED glow. The sensor module is mainly intended to provide a means of comparing Alcohol sources and being able to set an alarm limit when the source becomes excessive.

Circuit Specification

- Supply Voltage – 5 V
- Maximum Current – 200mA
- Output voltage
- Digital Output (5V)
• Analog Output (0 V to 5 V – Variations)

Features

• It provides alcohol gas PPM in the air
• TTL Level Compatible (Directly connection to Microcontroller)
• Analog output also available to connect this with ADC
• Value can be set through given potentiometer

<table>
<thead>
<tr>
<th>PIN No</th>
<th>PIN Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>GND</td>
<td>Supply Ground</td>
</tr>
<tr>
<td>DOUT</td>
<td>Digital Output (TTL Level)</td>
</tr>
<tr>
<td>AOUT</td>
<td>Analog Output (0V to 5 V)</td>
</tr>
<tr>
<td>5V</td>
<td>Supply +5V</td>
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</tbody>
</table>

Applications

• Automotive Domain
• Security & Surveillance
• Smart Home System
• Industrial Control System
Working of Circuit

The alcohol sensor circuit will detect the alcohol PPM in atmosphere depends on human breath and the signal will send data to LM358 (OP-Amp) to other circuits. The result of human breath contains alcohol that has detected from alcohol sensor circuit will changed into digital form.

The alcohol sensor MQ-3 is selected in this system due to its sensitivity in detection the small value of BAC. Has high sensitivity to alcohol and small sensitivity to benzene.

The sensor is able to detect BAC with different concentration and classified the range of BAC detected into a few level. Figure shows the overview of alcohol sensor MQ-3.
In our system we are detecting alcohol level in air by alcohol sensor MQ3. This sensor is directly connected to OP-Amp. Sensor Analog values are given to LM358 as Comparator which calculate PPM value of Alcohol sensor and compare it with present value. If the values of PPM increase more than 300 an alarm is raised and buzzer will be on.
Block Diagram

POWER SUPPLY

ALARM

LM358 (OP-AMP)

ALCOHOL SENSOR
POWER SUPPLY

Power supply is a reference to a source of electrical power. A device or system that supplies electrical or other types of energy to an output load or group of loads is called a power supply unit or PSU. The term is most commonly applied to electrical energy supplies, less often to mechanical ones, and rarely to others.

Here in our application we need a 5v DC power supply for all electronics involved in the project. This requires step down transformer, rectifier, voltage regulator, and filter circuit for generation of 5v DC power. Here a brief description of all the components are given as follows:
CIRCUIT DIAGRAM OF POWER SUPPLY
The LM358 series consists of two independent, high gain, internally frequency compensated operational amplifiers which were designed specifically to operate from a single power supply over a wide range of voltages. Operation from split power supplies is also possible and the low power supply current drain is independent of the magnitude of the power supply.
Basic op amp types such as the LM358 will perform adequately as comparators in simple circuits, such as a temperature controlled switch that is required to switch on or off a circuit when the input voltage from a temperature sensor is higher or lower than a preset reference value.

In above figure a reference voltage is applied to the non-inverting input, whilst a variable voltage is applied to the inverting input. Whenever the voltage applied to pin 2 is higher than the reference voltage on pin 3 the output will be at a low voltage, only slightly higher than \( -V_s \) and if pin 2 is at a lower voltage than pin 3, the output voltage will be high, slightly less than \( +V_s \).
However, standard op amps are designed for low power amplification purposes and if they are driven into, then out of saturation, it takes some time for the output voltage to recover and for the op amp to begin operating in a linear manner once more.

Op amps designed as amplifiers are not particularly suited to use as comparators especially where the input signals are changing rapidly in such applications as audio level sensors or analogue to digital converters.
The circuit has an alcohol sensor. This sensor measures the content of alcohol from the breath of drunken people on in air. The sensor delivers a current with linear relationship to the alcohol molecules from zero to very high concentrations. Output of the sensor is directly proportional to the alcohol content. When the alcohol molecules in the air meet the electrode that is between alumina and tin dioxide in the sensor, ethanol burns into acetic acid then more current is produced. So the more alcohol molecules more will be the current produced. Because of this current change, we get the different values from the sensor. Output of the sensor is then fed to the comparator for comparison. The output of the sensor is in the analog nature which should be converted into digital format. The LM358 controls the entire circuit. When the measured value reaches the threshold (here it is 300) the buzzer produces sound.
CONCLUSION

Our project Alcohol Detection System was implemented successfully. This device provides much advanced facilities in now a day’s life as it can be easily implemented in vehicles. Thus we can reduce alcohol related road accidents and hence these kinds of detectors have a great relevance. It can also be used in schools, colleges, offices and some public places such as hospitals, libraries etc. Through this project we present simple hardware interfacing.
REFERENCES


