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FINAL REPORT OF DIPLOMA PROJECT

FACULTY OF ELECTRICAL ENGINEERING

GAS DETECTOR
(CHLOROFLOUROCARBONS. CFCs)

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ABSTRACT

Final project is part of our course, structure that needs to be taken to complete our Diploma, by a student that is in the final years. This project has been required to finish in two semesters, which the first project (KEU280) is taken while in semester 05 and continued in second project (KEU 380) in semester 06. The main propose that all electronics students have to take this course is to give us opportunity to test our skill and to gather all the knowledge that we have been studying for this few years. From this kind of course, we can learn the practical way of doing the project such as design, drawing, experimenting, prototyping, testing and troubleshooting. We also can figure out the best way to improve our knowledge for the purpose of using in the future.

Nowadays, the rapid changes in quality of life require new technologies to fix with us. It is important to design new system that can make everything simpler as possible to operate. We choose this project because we always heard from a previous time about the depletion of ozone layer. The depletion of ozone layer will give an effect on our environment that it can increase the temperature of environment and it will cause a skin cancer. This project is called a 'Gas Detector (CFCs)'.

Due to the rapid increase in the use of refrigerants, in homes and automobiles, it is critical that everyone keep his or her air-conditioning system and refrigerators in good repair. Finding any possible refrigerant leaks is a must. The circuit described here will sniff out gas leaks. It uses a variable frequency oscillator system that emits a low-frequency audio tone when exposed to clean air but a higher tone when gas is detected by its unique, but readily available, TGS830 sensors. Six alkaline cells or 9-to-12V-power supply can power it.

ACKNOWLEDGEMENTS

THE ALL Mighty ALLAH s.w.t as proclaimed in the Quran that he would assist us regardless, be that in the of inspiration or outstanding excellency to surmount all predicaments. It is from our wise conscience and profoundly modest heart to devote immense gratitude to Him, for conferring us with ample ideas and encouragement in the progression of completing this project that called 'Gas detector' to fulfill the requirement for finished our Diploma.

In order to conclude this project, we have also utilized the assistance as of numerous masses. We would like to thank our honoured supervisor En. Anuar B. Mohamad @ Ahmad who had been our guider for this projects that is a requirement in our course. We learn many new things from him especially his valuable experiences in handling student problem in their project. We will never going to forget his advise on us to be more creative if we would like to produce a good project. Sincerely, we were encouraged by his attitude in helping student at any time and also his responsibility to make sure that we are really understands the work progress in this project. We will never forget his helping forever.

Our sincere appreciation also goes to Mr. Kazumi Unno as the representative of Figaro USA, Inc for his abundance cooperation and information about our gas sensor called 'TGS 830'. We also would like to thank our parents and friends for giving us non-stop moral support and material support to complete this project. Thanks to our senior that also given us idea and advise on how to improve our project.

Finally we would like to exclaim appreciation to those who deliberately or in deliberately assist us.

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1.1 INTRODUCTION

As we know, nowadays the temperature of world is increase and its cause the weather becomes hotter. The factor of this phenomenon happened is from the depletion of ozone layer. The ozone layer of our atmosphere is a very important "space suit" for our planet. It protects Earth from harmful ultraviolet rays contained in sunlight. Our ozone space suit is being destroyed by chlorofluorocarbons that are emitted into the atmosphere. Places where the ozone layer has been depleted (called "ozone holes") now allow harmful ultraviolet rays to reach Earth. Chlorofluorocarbons are chemical substances created by human beings. Chlorofluorocarbons are created when home video games are made, for example, and are used in refrigerators and air conditioners. These chlorofluorocarbons are not harmful to humans and have been a benefit to us in our daily lives for many years. However, when chlorofluorocarbons get out into the atmosphere, they are not destroyed near the Earth's surface and rise up into the stratosphere. There, they are bombarded by ultraviolet rays and destroyed. But the same reaction that destroys the chlorofluorocarbons in the stratosphere depletes the ozone layer.

Due to the rapid increase in the use of refrigerants, in homes and automobiles, it is critical that everyone keep his or hers air-conditioning system and refrigerator in good repair. Finding any possible refrigerant leaks is a must. The circuit describe here will sniff out gas leak.

This gas detector circuit begins when switch S_1 is closed, output from a 9V power source is fed to IC_1, which is a 5V-voltage regulator. Output from the regulator is fed to the FIGARO TGS 830 CFC sensor. When the sensor is exposed to clean air, its ohmic resistance is relatively high, around 30 k ohms. When the sensor is exposed to an atmosphere containing gas, its ohmic resistance is reduced. Thus, the sensor is a variable resistor, the ohmic value of which is inversely proportional to the concentration of gas being sensed.