VIVEKANAND EDUCATION SOCIETY'S INSTITUTE OF TECHNOLOGY

MINI PROJECT

ON

SENSOR ALARM USING THYRISTOR

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DEPARTMENT OF ELECTRONICS

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SENSOR ALARM USING THYRISTOR

Abstract :

The thefts in the places such as banks, shops, ,treasuries etc are increasing day by day. All these places occupy a very large area and to alert the concerned authorities over such a large area we need an alarm system which can operate and withstand large power. Sensor alarm using thyristor is a device which can perform this task. This project report discusses the operation, advantages, disadvantages and the future scope of Sensor alarm using thyristor.

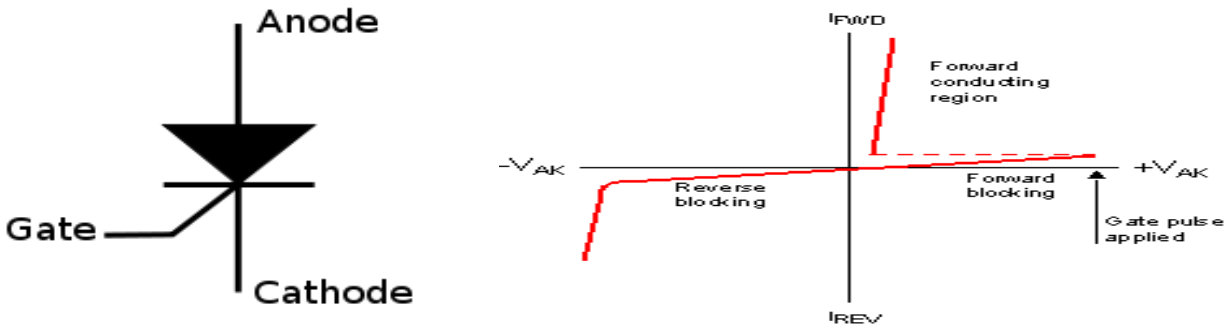
INTRODUCTION:

Sensor alarm using thyristor as the name indicates does the job of sensing and indication using an alarm. The circuit uses diodes, capacitors, resistors for biasing the thyristor and sounding the alarm. This sensor alarm is designed to detect intrusion, unauthorized entry into a building or area. These sensor alarms can be used in residential, commercial, industrial, and military properties where the coverage area for alarm is very large for protection against burglary (theft) and as a tool for personal protection against intruders .The basic idea was to make a senor alarm which can withstand and operate on large power and serve a purpose of burglary protection and intrusion protection.

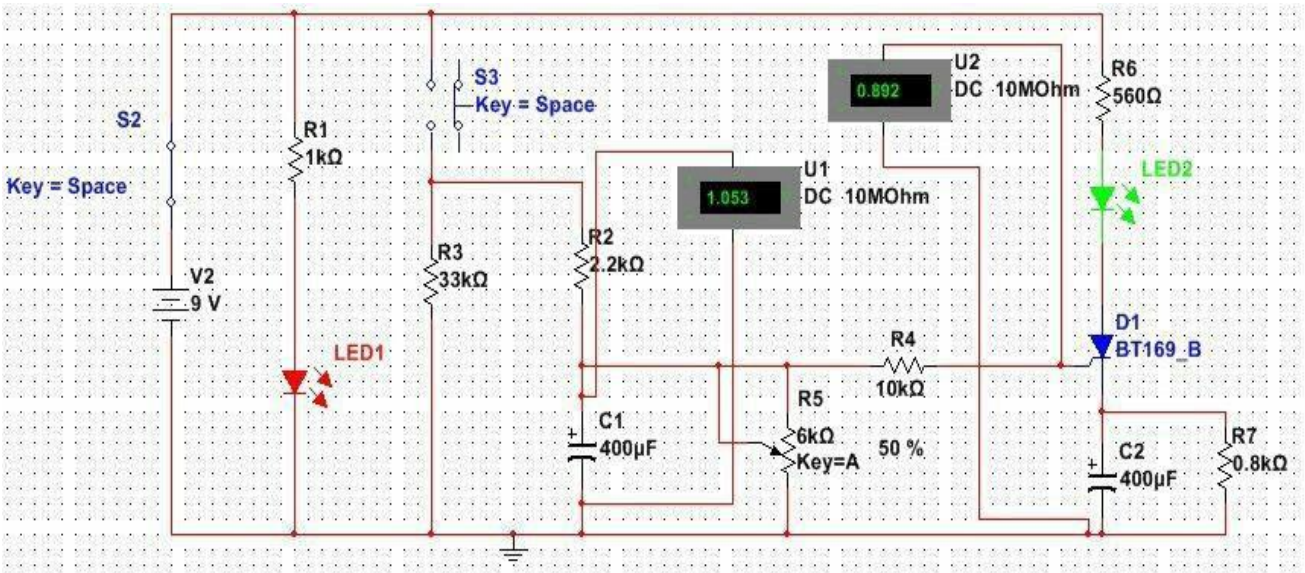
PROJECT COMPONENTS:

- Voltage supply-9V
- Switches
- Thyristors
- LEDs
- Resistors(ohms)
  R1=1K
  R2=2.2K
  R3=33K
  R4=10K
  R6=560
  R7=0.8K
- Capacitors(uF)
  C1=400
  C2=400
- Potentiometer-6K ohms

WORKING/DESIGN:



A thyristor is a two- to four-lead solid-state semiconductor device with four layers of alternating N and P-type material.They act exclusively as bistable switches, conducting when their gate receives a current trigger, and continue to conduct while they are forward biased (that is, while the voltage across the device is not reversed). A three-lead thyristor is designed to control the larger current of its two leads by combining that current with the smaller current or voltage of its other lead - known as its control lead. On the other hand, a two-lead thyristor is designed to 'switch on' if the potential difference between its leads is sufficiently large - a value representing its breakdown voltage.



The red led shown in the above circuit diagram indicates the state of input supply voltage, when red led is on it indicates that supply voltage is on and vice versa. The resistor R2 and capacitor C1 forms the R-C charging system. While resistor R5 is used to adjust the firing angle of SCR. The green led is the actual output, it glows only when SCR gets triggered.

Initially suppose supply voltage is OFF so both red and green led are off. Now, supply voltage is turned ON so simultaneously red led glows but green led is still off. Now if switch is pressed by user after adjusting R5 for certain value, immediately green led glows as soon

as voltage across capacitor equals triggering voltage of SCR. Due to this SCR goes in forward conducting region and green led glows. Now, when switch is released capacitor C2 discharges through R7 and after some time SCR gets turned OFF and green led too turns off.

Thus the firing angle of SCR and in turn the time for which green led glows can be controlled by user by adjusting value of resistor R5.

ADVANTAGES:

- Circuit is compact and simple to design.
- Thyristors can provide controlled rectification, that is, provide DC from an AC source with a wide range of voltage or current control.
- Firing angle can be adjusted from 0 to 180 degrees with very less variation of resistor.

DISADVANTAGES:

- Circuit is application specific and for using same circuit for related applications some modifications are need.
- Thyristors "latch" in the on state once they begin to conduct and remain on after the gate pulse is removed until they are reverse biased.

APPLICATIONS:

- Signaling for help through SOS.
- In communication between ships.
- During maritime operations.
- During situations regarding security and easy transmission of important messages.

RESULT:

The sensor alarm senses if there is any emergency and led is used for the its indication. A buzzer can also be used for indication.

CONCLUSION/FUTURE SCOPE:

Thus, we have designed a sensor alarm using thyristor which can withstand large power and can be used for various security applications. A buzzer or an alarm system can be incorporated for better results. For multilevel emergencies, a firing circuit can be used with of help of which the firing angle of thyristor(i.e. the period of the indicator) can be varied.

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