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## Analysis of SCR, R and RL load, R and RC, DIAC circuit

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### ABSTRACT

*In this report it consist of how the model is done of study of DIAC characteristics, R & RC Triggering circuit, & speed controlling using SCR. SCR is a unidirectional device that allows the current in one direction & repel in another direction. SCR is three terminal device anode, cathode, & gate. SCR has built in characteristics to turn ON or OFF. When the PV inverter is connected to the R load operating in high frequency it is found that voltage level is doubled and current is in phase with the voltage & when the PV inverter connected to the RL load the voltage level is doubled as in the R load and the current is lagging with respect to the voltage. In R triggering circuit firing angle is limited to 90 degree only & RC triggering circuit which provides the firing angle control from 0 to 180 degree. These are the most frequently used method of triggering. A DIAC is a two-way semiconductor switch that can be turned on in both forward & reverse polarities above a certain voltage.*

**Keywords:** Teaching Aids, Electronic, Circuit Kit, Design and Technology.

### 1. INTRODUCTION

Silicon controlled rectifier, abbreviated as SCR is a high-power electrical component, also known as a thyristor. It has the advantages of small size, high efficiency and long life. In the automatic control system, it can be used as a high power drive device to realize the control of high-power equipment with low-power controls. It has been widely used in AC & DC motor speed control system, power control system and servo system. An RL circuit (also known as an RL filter or RL network) is known as an electrical circuit consisting of the passive circuit elements of a resistor (R) and an inductor (L) connected together, is drive by a voltage source or current source. The basic passive linear circuit elements are the resistor (R), capacitor (C) and inductor (L). These circuit elements can be connect to form an electrical circuit in four different ways: the RC circuit, the RL circuit, the LC circuit and the RLC circuit with the abbreviations indicating

which components are used. These circuits exhibit important types of behaviour that are basic to analogue electronics. In specific, they are able to act as passive filters. This article considers as RL circuit in both series and parallel as shown in the diagrams. A diac is an important member of the thyristor family and is usually used for triggering triacs. A diac is a two-electrode

Bidirectional avalanche diode which can be switched from off-nation to the on-nation for either polarity of the carried out voltage. That is similar to a triac without gate terminal, as proven in determine. Its equal circuit is a pair of inverted four layer diodes. Two schematic symbols are shown in figure. Once more the terminal designations are arbitrary because the diac, like triac, is also a bilateral device. The switching from off-kingdom to on-country is executed by way of honestly exceeding the avalanche break down voltage in either route.

### 2. V-I CHARACTERISTICS OF SCR

A V-I Characteristic of SCR (Silicon Controlled Rectifier) is the voltage current characteristics. The cutting-edge thru the SCR varies because the Anode to Cathode terminal voltage and Gate to Cathode terminal voltage is numerous. The graphical representation of present day via the SCR and voltage throughout the anode to cathode terminal is called V-I traits of SCR.

To acquire V-I characteristics of SCR, its anode and cathode are connected to the supply via the load. The Gate and cathode are fed thru a separate source which is supposed to provide nice gate cutting-edge from gate to cathode. The elementary circuit diagram for obtaining V-I characteristics of SCR is fig a careful observation of the V-I characteristics reveal that an SCR has three basic mode of operation: opposite blocking Mode, ahead blocking Mode and forward Conduction Mode.

### 3. R AND RL LOAD

A resistor-inductor circuit (RL circuit), or RL filter out or RL network, is an electric powered circuit composed of resistors and inductors driven by means of a voltage or modern supply. A first-

order RL circuit is composed of one resistor and one inductor and is the simplest type of RL circuit. A single phase half wave controlled rectifier is thyristor based totally circuit which produces output voltage for effective half of the supply voltage however, the segment dating between the initiation of load present day and deliver voltage may be controlled by means of converting firing perspective. That is the motive; it is called segment controlled 1/2 wave rectifier. In this newsletter, we will speak the circuit diagram, average load voltage, average load present day and RMS load voltage for a unmarried segment 1/2 Wave controlled Rectifier with RL load.uit

**4. R AND RC TRIGGERING CIRCUIT**

It consists of variable resistor, two diodes, SCR (Silicon controlled Rectifier), Capacitor, Load resistor. The panel of an RC Triggering is shown fig.

R-C-Diode circuit giving full half-cycle manage (one hundred eighty electric ranges). at the nice 1/2-cycle of SCR anode voltage the capacitor fees to the cause point of the SCR in a time determined by the RC time constant and the rising anode voltage. The pinnacle plate of the capacitor prices to the height of the negative voltage cycle through diode D2 at the bad half of-cycle, resetting it for the subsequent charging cycle.



Fig. 01

**.DIAC circuit**

A diac is an essential member of the thyristor own family and is normally hired for triggering triacs. A diac is a -electrode bidirectional avalanche diode which can be switched from off-kingdom to the on-kingdom for both polarity of the carried out voltage. That is just like a triac without gate terminal, as proven

in discern. Its equal circuit is a pair of inverted four layer diodes two schematic symbols are shown in figure. Again the terminal designations are arbitrary because the diac, like triac, is also a bilateral device. The switching from off-kingdom to on-country is carried out by way of absolutely exceeding the avalanche ruin down voltage in either direction.



Fig. 02

**5. FUTURE SCOPE**

This panel is very useful in laboratory. In laboratory these kit are useful for students to use in the lab. It is very useful for operation and to perform fast and safe.

**6. CONCLUSION**

While preparing this project we conclude that, we got informations on given topic. We understood different types of kits and its working.

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