

## ② Parallel operation of SCR's.

### - Ideal Condition :-

All the SCR's connected in parallel have same ratings and identical characteristics. Due to this identical characteristics, they share equal current.

### - Practical Condition :-

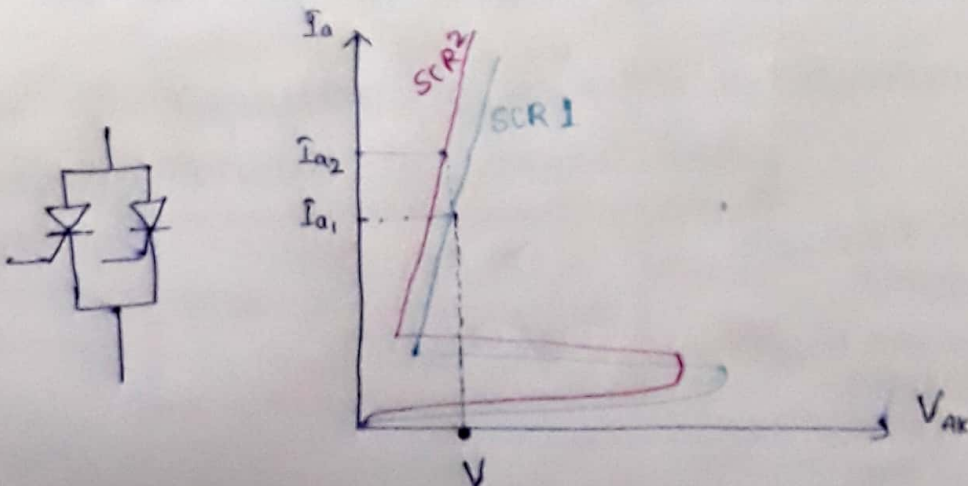
- However, practically, even when SCR's have same ratings, they do not have identical characteristics. So, current shared by each SCR in parallel is not equal.

∴ Problem related to parallel connected SCR's :- Unequal sharing of current.

- There are various reasons for unequal sharing of current by SCR's connected in parallel. Some of the reasons and their possible solution is as follows.

### ① Reason 1 :-

- Unequal sharing of current because of difference in forward conduction characteristics



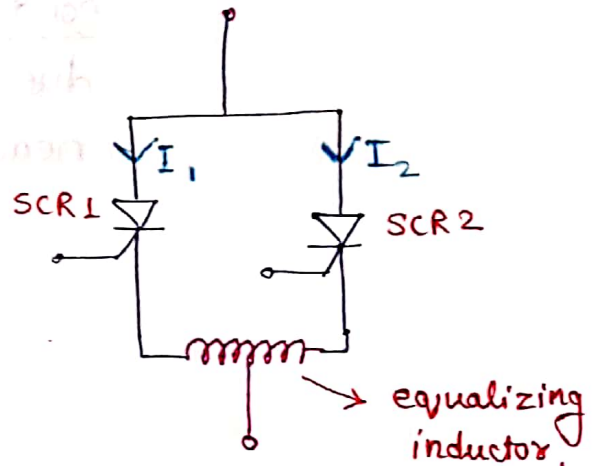
- For the same applied voltage,  $V$  across all the SCRs connected in parallel, we can see that current shared by them differs.

### Solution :-

- In ac circuits, current distribution can be made uniform by magnetic coupling of parallel paths.

- A centre-tapped inductor is used as equalising circuit.

- No. of turns on both sides of the centre tap are same.



### (a) When $I_1 = I_2$

When current in both the SCRs are same, then the flux produced by the two halves of the inductor cancel each other. So, there will be no voltage drop in the reactor.

### (b) When $I_1 > I_2$

Fluxes produced by the two halves are not equal. Flux produced by one half induces voltage which opposes  $I_1$ , and other half produces voltage which aids  $I_2$ . So, the currents become equal.

## ② Reason 2 :-

↳ Unequal sharing of current caused by inductive effect of current carrying neighboring conductors.

↳ If SCRs are connected on heat sink in the manner shown, then the middle conductor will have more inductance due to flux linkages from two nearby conductors.



Heat Sink  
↓  
Conductor connected to SCR2 will have more inductance.

↓  
So, due to higher inductance of middle conductor, middle SCR will have lower current as compared to the other two SCRs.

## Solution :-

- The above problem can be overcome by mounting the SCRs symmetrically on the heat sink.

