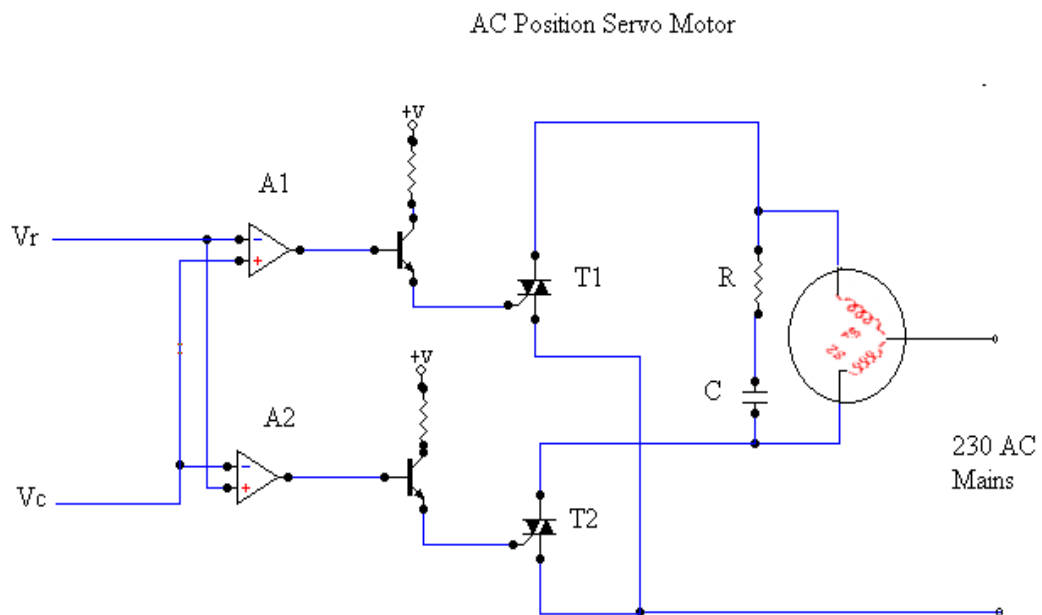


**Experiment No. 4****Date :****Title:**

Study AC position control of Servomotor.

**Apparatus:**

RLC network kit, Patch cords, Power supply, etc

**Diagram:****Theory:****Two phase servomotors:-**

A two phase servomotors, commonly used for instrument servomotors mechanism, is similar to a conventional two phase induction motor except for its special design consideration. It uses a squirrel cage rotor. This rotor has a small diameter to length ratio to minimize the moment of inertia & to obtain good accelerating characteristics.

In servomotors system R-C phase split network is used for providing single phase supply to the two phase to the two phase of the motor.

When phase is provided to point A, motor moves in forward direction.

When phase is provided to point B, motor moves in reverse direction.

### **AC servo position system:-**

#### **Control circuit:-**

The potentiometer is configured as error detecting devices. One is reference potentiometer & other is o/p potentiometer. The o/p of both potentiometer is connected to the comparator as shown in diagram.

Depending upon the angular position of reff. & O/p potentiometer, the voltage VR & VC will be determined the O/p of comparator A<sub>1</sub> & A<sub>2</sub>.

If VR is greater than V<sub>c</sub>, V<sub>02</sub> is high & V<sub>01</sub> is low.

If VR is greater than V<sub>c</sub>, V<sub>01</sub> is high & V<sub>02</sub> is low.

O/p V<sub>01</sub> & V<sub>02</sub> are brought together to proper level using transistor which triggers TRIAC T<sub>1</sub> & T<sub>2</sub> correspondingly

In above ckt. either , V<sub>01</sub> & V<sub>02</sub> will be there which trigger either triac T<sub>1</sub> or T<sub>2</sub> at any time & hence motor will rotate in either direction depending upon status of triac to avoid this, proper hysteresis is purposefully introduced in above ckt. By connecting two resistor of minimum different values in i/p of two comparators.

This will introduced hysteresis in the system, i.e. while changing to upper position one comparator will respond slightly latter than while owing to lower position. This creates major error in the system & at lower end (0-45°) & at upper end (270-330). Output potentiometers do not follow reff. Potentiometer.

#### **Advantages:-**

1. It is very rugged & reliable.
2. It is used in AC servo controlled voltage stabilizer.

#### **Procedure:**

1. Set reff. Potentiometer at 0 degree level.
2. Power on the circuit.
3. Note the position of the o/p Potentiometer.
4. Slowly change the position of the reff. Potentiometer in steps of 22.5 degree & note the position of o/p potentiometer.
5. Tabulate the result.

6. Plot the graph of reff. Potentiometer position or against o/p Potentiometer position
7. Note the linear range of operation from the graph.
8. Note the error for both cases, i.e. while changing reff. Potentiometer from 0 to 270 & 270 to 0.

**Observation Table:**

Sr.No.	$\Theta$ R	$\Theta$ C
1		
2		
3		
4		
5		

**Result:****Conclusion:**