	DEHRADUN INSTITUTE OF TECHNOLOGY		LABORATORY MANUAL
	<b><u>PRACTICAL INSTRUCTION SHEET</u></b>		
	EXPERIMENT TITLE : To study the Servo Voltage Stabilizer		
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**Objective:** To study the Servo Voltage Stabilizer.

**Apparatus Used:**

Name of the apparatus	Range/Rating	Quantity
1. Servo Voltage Stabilizer	2 kVA	1
Output Voltage: 230 V, Load current: 8.5 A, Input Voltage: 170-290 V, Input frequency: 50-60 Hertz		
2. Lamp Load bulbs each 200 W	2 kVA	10

**Theory**

Servo Voltage Stabilizer save the life of costly appliances, CNC machines, electrical equipment, medical equipment's, motors, lab equipment etc. by correcting the voltage fluctuations in the incoming AC voltage and bringing and keeping it at the desired voltage levels.

**The principal of operation of servo stabilizer**


The control circuit controls the servo motor. The motor is mechanically attached to the arm of a continuously variable auto transformer which feeds to the primary of a series control buck boost transformer. The stabilizer output voltage is compared with the reference voltage & resultant error signal controls the servo motor which corrects the voltage by bringing it to the preset voltage.

**Operating Instructions:**

**A. MANUAL Operation:**

Put the control mode switch on the front panel in the manual position, adjust the output voltage too the desired level with RAISE/LOWER switch which rotates the motor that in turn adjusts the variable voltage transformer in such a way as to give the desired output. Needless to say that this output voltage will change with input variation. This has to be manually adjusted again to the desired voltage level in case of fluctuating input supply voltage. The manual control has been basically provided to obtain

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uninterrupted output voltage. even when control circuit develops a fault or is being replaced or checked.

- B. AUTOMATIC Operation:** Put the control mode switch in auto position to recheck whether the input and output connections are properly made as described above. In auto mode the unit is giving stable output as specified by automatic correction for input voltage or load fluctuations.

**Circuit Diagram-**

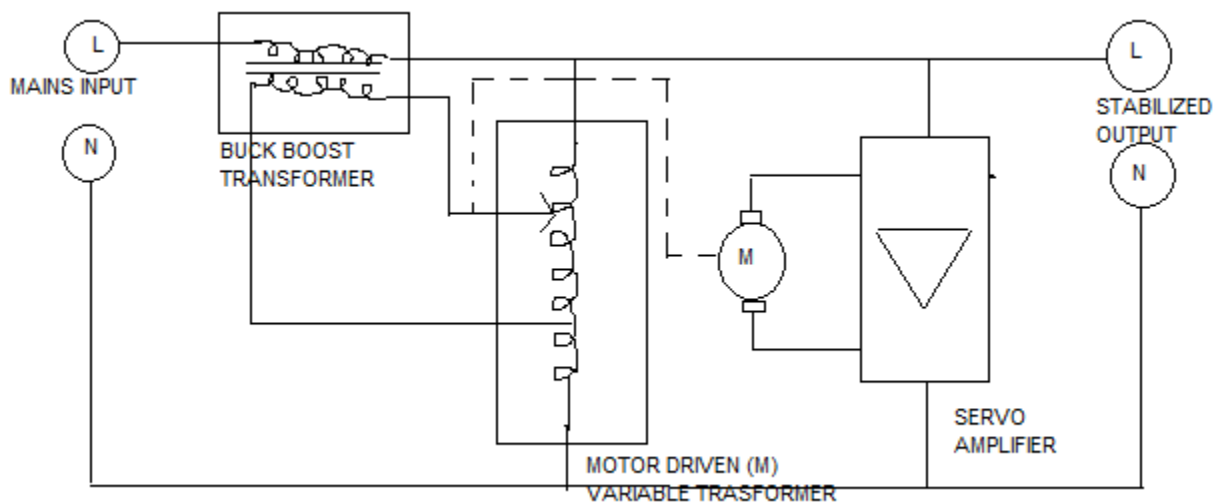



Fig 1. Circuit diagram of Servo Voltage Stabilizer

**PROCEDURE:**

- Connect the variable load with ammeter to the output of servo stabilizer.
- Connect the input of servo stabilizer to the mains 220 volt, 50 hertz and adjust the output voltage at 220 volt.
- Now vary the load at steps to maximum load and record the output voltage and current and find out the percentage load regulation.

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**Observation Table:**

OUTPUT VOLT AT NO LOAD:					
S. NO.	LOAD (W)	OUTPUT VOLTAGE (V)	CURRENT (A)	REGULATION (%)	REMARK

**CALCULATION:**

$$\% \text{ LOAD REGULATION} = \frac{(\text{NO LOAD OUTPUT VOLTAGE} - \text{OUTPUT VOLTAGE ON LOAD})}{\text{OUTPUT VOLTAGE WITH LOAD}} \times 100$$

**RESULT:** It is observed that the specified output voltage is almost remain same even if we increase the load or there are fluctuations in the supply.

**Precaution:**

- i. While studying the load characteristics the maximum current should not exceed the current rating specified.
- ii. The output socket of the transformer must never get short circuited even momentarily.

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