Magnetization Characteristics of Separately Excited D.C Generator

Exp. No: **Date:**

Aim: To obtain the magnetization characteristics and to find Critical field resistance of separately excited D.C generator.

Name Plate Details:

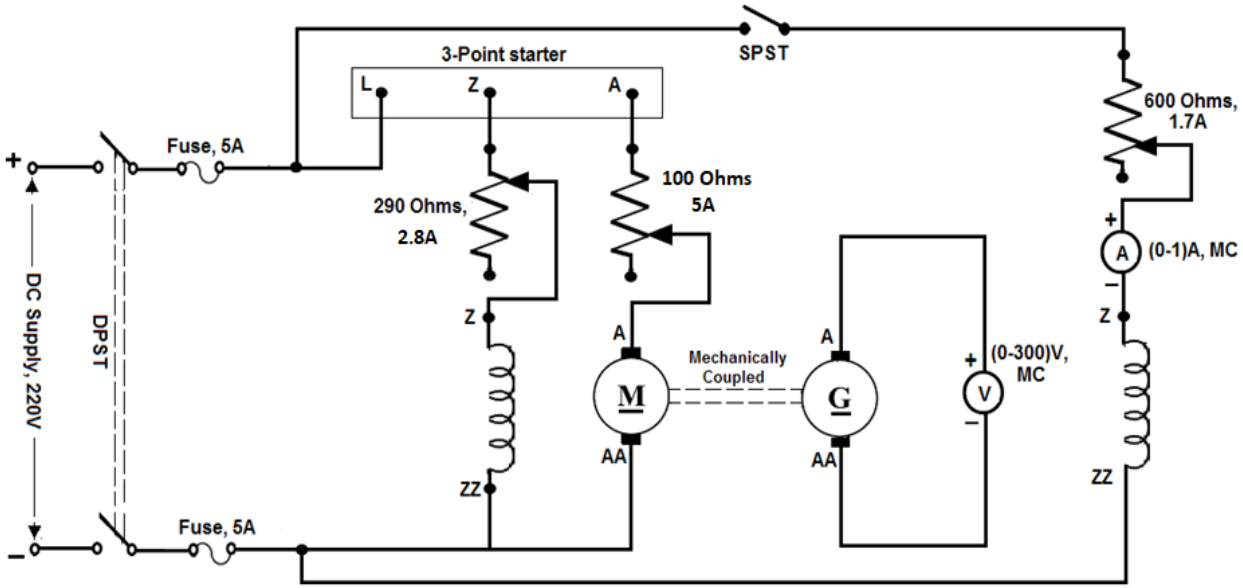
	Motor	**Generator**
1. HP/ KW:	2 HP	1.3 KW
2. Armature Voltage:	220 V	220 V
3. Armature Current:	8A	5.9A
4. Field Voltage:	220 V	220 V
5. Field Current:	0.7A	0.7A
6. Speed:	1500 RPM	1500 RPM
7. Insulation Class:	B	B

Apparatus required:

S.No	**Name of the equipment**	**Range/ Specification**	**Type**	**Quantity**
1	Voltmeter	(0-300) V	MC	1
2	Ammeter	(0-1) A	MC	1
3	Rheostat	100Ω, 5A 290Ω, 2.8A 600Ω, 1.7A	Wire wound ,, ,,	1 1 1
4	3-Point starter	-	-	1
5	Tachometer	60-1,00,000 RPM	Digital	1
6	Connecting wires	1.5sqmm	Copper	Adequate

Procedure:

1. Connect the circuit as shown in the circuit diagram.
2. Keep the switch S_1 in open position.
3. Keep the field rheostat of the motor at its minimum position and the Armature rheostat of the motor, field rheostat of the generator should be at their maximum position.
4. To start the motor, close DPST switch and move the starting arm of the 3-point starter slowly in clockwise direction.
5. Then bring the motor-generator set to its rated speed (1500 RPM) by first decreasing the armature resistance and then by increasing the field resistance of the motor.
6. Now note the generated voltage (i.e. Residual voltage) and the corresponding field current at S_1 in open position.
7. Now close switch S_1 and by slowly decreasing the resistance which is connected in series with the field winding of generator, note down the output voltage and the corresponding field current of the generator until the generated voltage becomes 120% of its rated value.

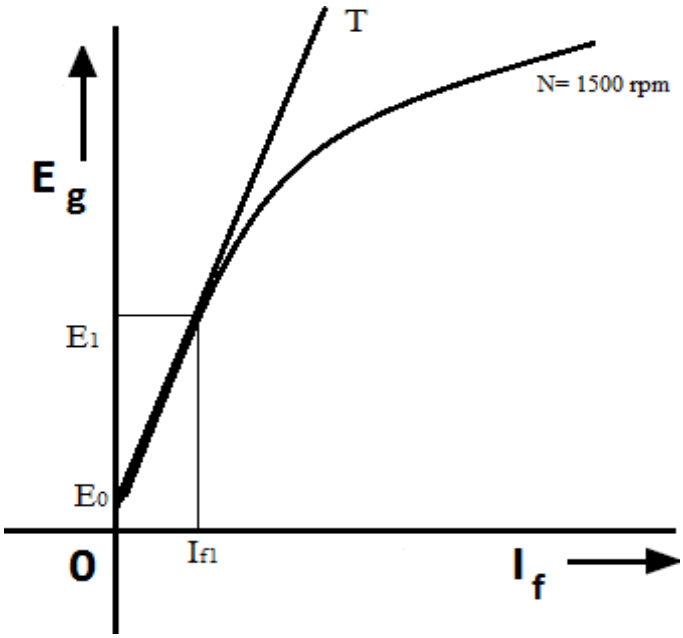


Magnetization Characteristics of a separately excited DC Generator

Tabular column:

S No	Field Current **(I_f)**	Generated Voltage **(E_g)**

Model graph:



Theoretical calculations:

Critical field resistance at rated speed $R_C = E_1 / I_{f1}$

Precautions:

1. Connections should be tight
2. Check the connections before switching on the supply
3. Readings should be taken without parallax errors.

Result: