

(A) OCC TEST ON DC SHUNT GENERATOR

(B) LOAD CHARACTERISTICS OF DC SHUNT GENERATOR

Exp no: 1

Date

(A) OCC TEST ON DC SHUNT GENERATOR

Aim: To obtain the open circuit characteristics of a self-excited DC shunt generator.

B) To conduct a load test on DC Shunt Generator and to draw its load characteristics from the obtained data.

Apparatus required:

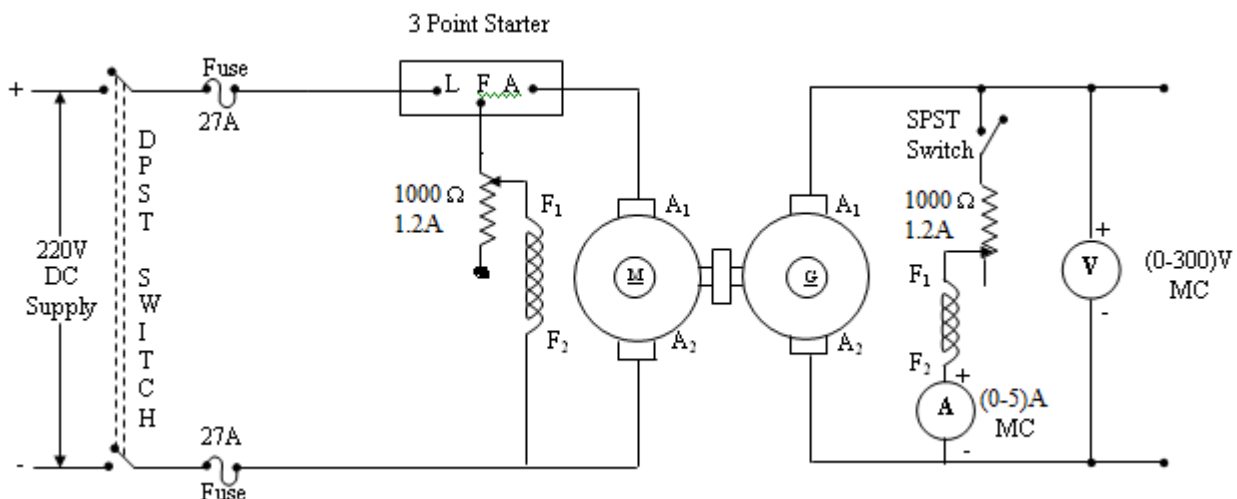
S.no	Name of the Apparatus	Range	Type	Quantity
1.	Ammeter	(0-2)A (0-20)A	MC MC	1
2.	Volt meter	(0-300)V	MC	1
3.	Rheostats	1250Ω/0.8A	Wire wound	2
4.	Tachometer	(0-3000)rpm	Digital	1
5.	Connecting wires	2.5sq.mm	Copper /Aluminum	Few

Name plate details:

Procedure:

1. Connections are made as per the circuit diagram.
2. After checking minimum position of motor field rheostat, maximum position of generator field rheostat, DPST switch is closed and starting resistance is gradually removed.
3. By adjusting the field rheostat, the motor is brought to rated speed.
4. Voltmeter and ammeter readings are taken when the SPST switch is kept open.
5. After closing the SPST switch, by varying the generator field rheostat, voltmeter and ammeter readings are taken.
6. After bringing the generator rheostat to maximum position, field rheostat of motor to minimum position, SPST switch is opened and DPST switch is opened.

Circuit diagram:



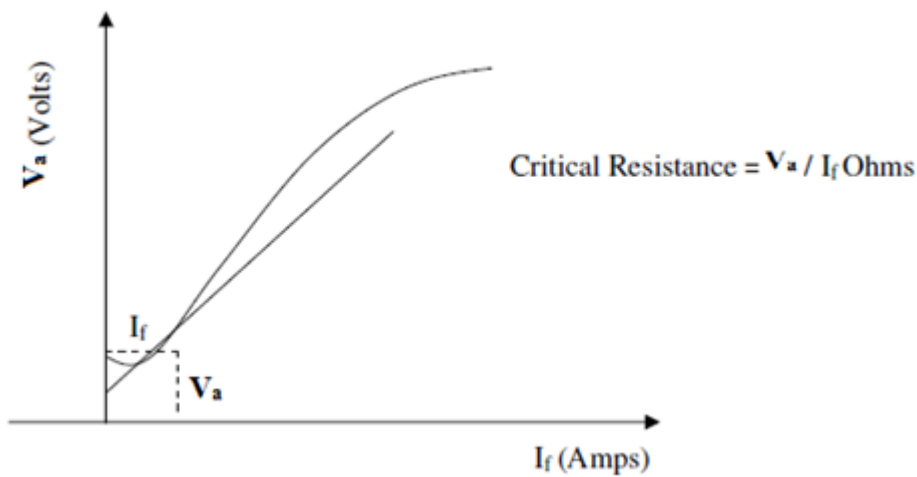
Precautions:

1. The field rheostat of motor should be in minimum resistance position at the time of starting and stopping the machine.
2. The field rheostat of generator should be in maximum resistance position at the time of starting and stopping the machine.

Observation Tables:

S.No	Field current I_f (Amps)	Armature Voltage V_a (Volts)

Model Graphs:



Result:

(B)LOAD CHARACTERISTICS OF DC SHUNT GENERATOR

Aim: To conduct a load test on DC Shunt Generator and to draw its load characteristics from the obtained data.

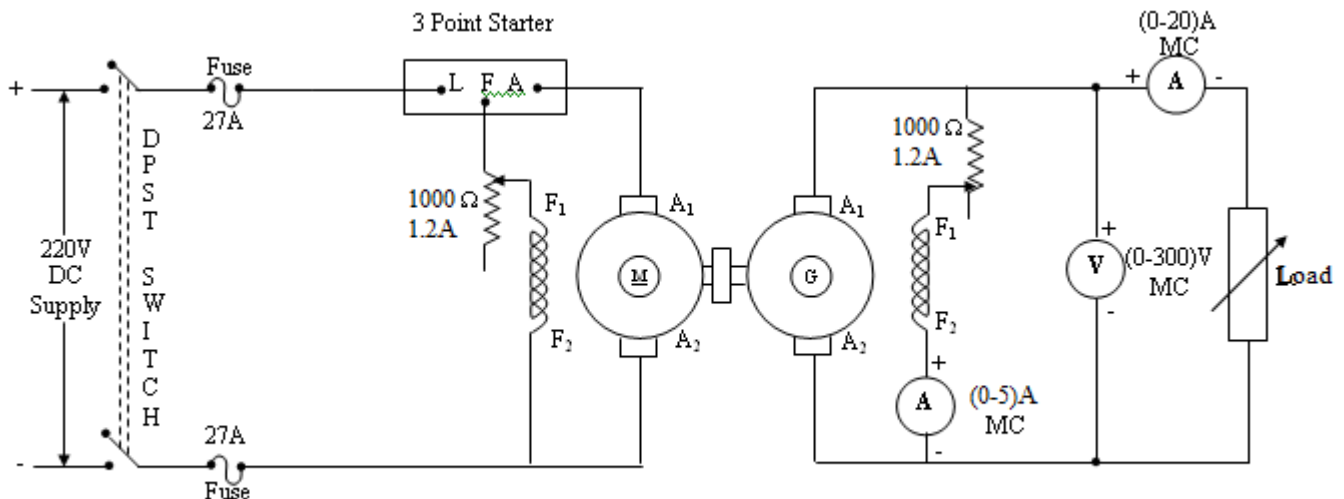
Apparatus required:

S.no	Name of the Apparatus	Range	Type	Quantity
1.	Ammeter	(0-20)A	MC	1
2.	Ammeter	(0-2)A	MC	1
3.	Volt meter	(0-300)V	MC	1
4.	Tachometer	(0-3000)rpm	Digital	1
5.	Connecting wires	2.5sq.mm	Copper /Aluminum	Few

Name plate details:

1. Connections are made as per the circuit diagram.
2. After checking minimum position of DC shunt motor field rheostat and maximum position of DC shunt generator field rheostat, DPST switch is closed and starting resistance is gradually removed.
3. Under no load condition, Ammeter and Voltmeter readings are noted, after bringing the voltage to rated voltage by adjusting the field rheostat of generator.
4. Load is varied gradually and for each load, voltmeter and ammeter readings are noted.
5. Then the generator is unloaded and the field rheostat of DC shunt generator is brought to maximum position and the field rheostat of DC shunt motor to minimum position, DPST switch is opened.

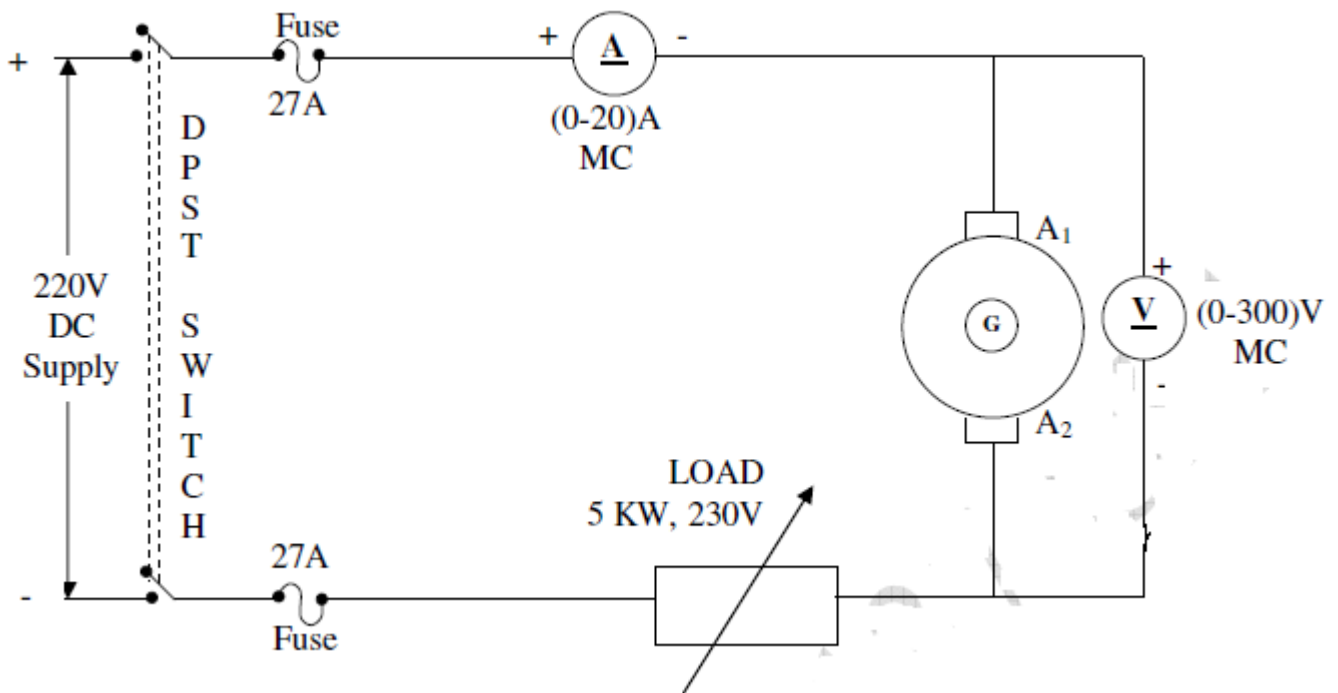
Circuit diagram:



Precautions:

1. The field rheostat of motor should be in minimum resistance position at the time of starting and stopping the machine.
2. The field rheostat of generator should be in maximum resistance position at the time of starting and stopping the machine.

DETERMINATION OF ARMATURE RESISTANCE:



PROCEDURE:

1. Connections are made as per the circuit diagram.
2. Supply is given by closing the DPST switch.
3. Readings of Ammeter and Voltmeter are noted.
4. Armature resistance in Ohms is calculated as $R_a = (V \times 1.5) / I$

Observation Tables:

For Armature Resistance:

S.No	Voltage(Volts)	Current(Amps)	Armature Resistance(Ω)

For External voltage and Current:

S.No	Field Current I_F (Amps)	Load Current I_L (Amps)	Terminal voltage V (Volts)	$I_a = I_L + I_F$ (Amps)	$E_G = V + I_a R_a$ (Volts)

Formulae used:

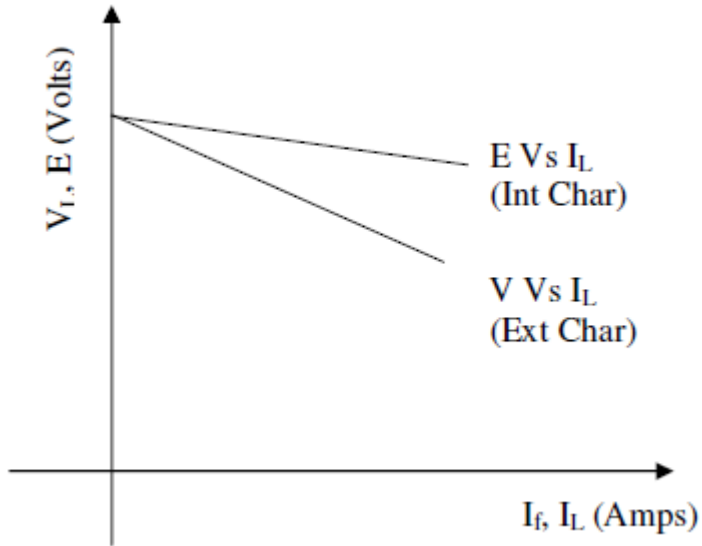
$$E_G = V + I_a R_a \text{ (Volts)}$$

$$I_a = I_L + I_F \text{ (Amps)}$$

EG: Generated emf in Volts
V: Terminal Voltage in Volts
Ia: Armature Current in Amps
IL: Line Current in Amps
IF: Field Current in Amps
Ra: Armature Resistance in Ohms

Model Calculations:

Model Graphs:



Result: