	DEHRADUN INSTITUTE OF TECHNOLOGY		LABORATORY MANUAL
	PRACTICAL INSTRUCTION SHEET		
	EXPERIMENT TITLE : Speed Control of DC Motor by field control method		
	EXPERIMENT NO. :	ISSUE NO. :	ISSUE DATE :
REV. NO. V	REV. DATE : 01/01/2016	PAGE /	
DEPTT. : Electrical Engineering	LABORATORY : Intro to Electrical & Electronics Lab EA1210	SEMESTER : I / II	

Objective:- speed (N) control of a DC shunt motor by field control method and to draw speed (N) vs. field current (I_f) characteristics.

Apparatus Used:- D.C shunt motor, D.C Ammeter(0-2A), D.C Voltmeter (0-250V), 3-point D.C Starter , Rheostat, tachometer

Theory:-

Back emf of DC motor

$$E_b = \frac{PNZ\Phi}{60A} = V - I_a R_a$$

So speed of DC motor

$$N \propto \frac{E_b}{\Phi}$$

$$N = K \frac{E_b}{\Phi} = K \frac{(V - I_a R_a)}{\Phi}$$

Where V= Applied voltage

I_a = Armature current

R_a = Armature resistance

Φ = Field flux


$\Phi \propto$ Field current (I_f)

Therefore speed of a D.C motor can be changed by following methods:-

- 1- By changing applied voltage (V)
- 2- By inserting a resistance in armature winding with R_a
- 3- By changing field current (i.e. by changing Φ) method is called Field control method

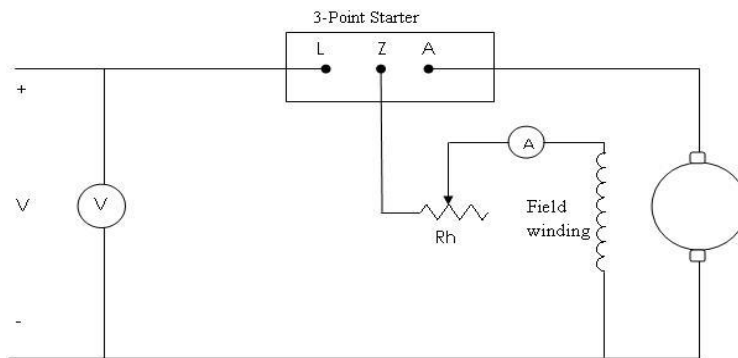
PREPEARD BY :- Mr. Nafees Ahmed

APPROVED BY :- Dr. Gagan Singh

	DEHRADUN INSTITUTE OF TECHNOLOGY		LABORATORY MANUAL
	PRACTICAL INSTRUCTION SHEET		
	EXPERIMENT TITLE : Speed Control of DC Motor by field control method		
	EXPERIMENT NO. :	ISSUE NO. :	ISSUE DATE :
REV. NO. V	REV. DATE : 01/01/2016	PAGE /	
DEPTT. : Electrical Engineering	LABORATORY : Intro to Electrical & Electronics Lab EA1210	SEMESTER : I / II	

Hence speed can be changed by changing the field flux (Φ) and Φ can be changed by changing field current (I_f) and field current can be changed by inserting a resistance (Rheostat) in series with the field winding.

Connection Diagram:-



Observation:-

S.No	Field Current (I_f) in Amperes	Speed (N) in rpm

Result: - The speed vs. Field current characteristics is drawn on the attached graph.

Precautions:-

1. All the connections should be tight.
2. Never touch the live terminal during the experiment.
3. Before changing the connection, switch off the supply properly.
4. Increase the rheostat carefully and gradually.
5. Always use the starter of proper rating.
6. Always wear shoes when working in the lab. Avoid wearing loose clothes, hanging chains etc.
7. Make proper contact when measuring the speed with Tachometer.

PREPEARD BY :- Mr. Nafees Ahmed	APPROVED BY :- Dr. Gagan Singh
Visit us at www.eedofdit.weebly.com	