Practical No. 10: Start any DC motor using corresponding starter and observe speed on tachometer.

I Practical Significance:

DC shunt motor draws very high current during starting which may burn armature winding. Hence to protect DC shunt motor from damage due to heavy starting current, Three point starter is used to start DC shunt motor.

II Industry/Employer Expected Outcome(s)

Use electrical equipment efficiently for different electronic engineering application.

Select and connect DC motor to DC supply using particular starter for different applications.

III Course Level Learning Outcome(s)

Select the transformer and DC motor for the given application.

IV Laboratory Learning Outcome(s)

LLO Connect DC motor to DC supply.

LLO Select particular starter for particular motor starting.

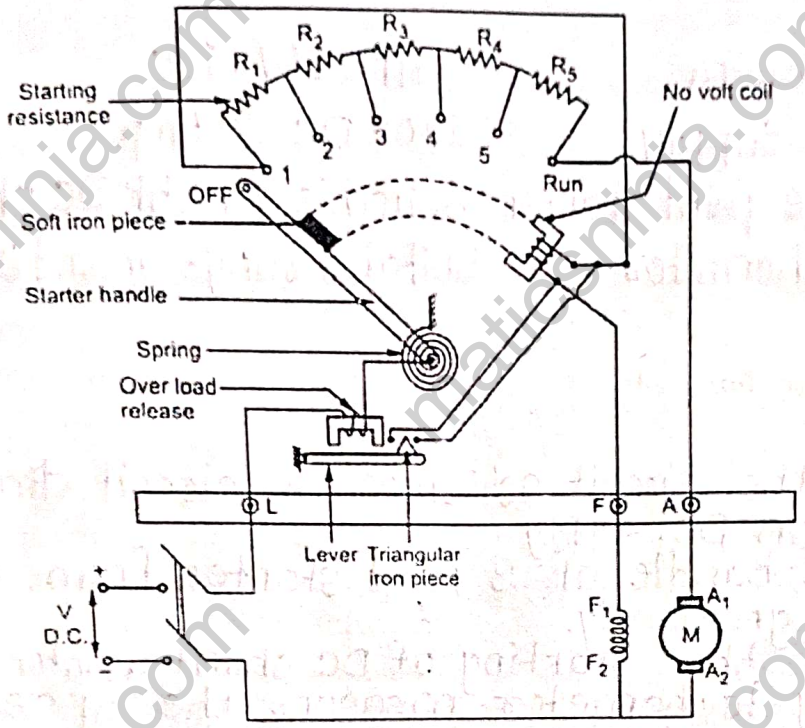
V Relevant Affective Domain related outcome(s)

Follow safety electrical rules for safe practices.

VI Relevant Theoretical Background

- 3 point starter is a device whose main function is starting of DC shunt motor. The 3 point starter connects the resistance in series with the circuit which reduces the high starting current and hence protect DC Shunt motor from damage. For DC series motor 2 point starter is used.

VII Actual Circuit diagram used in laboratory with equipment Specifications:



VIII Required Resources/apparatus/equipment with specification:

S.No.	Name of Resource	Suggested Broad Specification	Quantity
1	DC motor	3 HP 220V, DC	1
2	DC supply	220V DC 20 Amp	1
3	Three point starter	Suitable for 3 HP DC shunt motor	1
4	Tachometer	Suitable range around 0 to 5000 rpm	1

IX Precautions to be followed:

1. Connect the three point starter with DC shunt motor properly.

X Procedure

1. Connect the circuit as shown in circuit diagram.
2. Switch on DC supply.
3. Move the handle of 3 point starter from Start to Run position gradually.
4. Observe the starting of DC shunt motor.
5. By using tachometer measure the speed of the DC shunt motor

XI Required Resources/apparatus/equipment with specification:

S. No.	Name of Resource	Suggested Broad Specification	Quantity
1	DC motor	3 HP 220V, DC	1
2	DC Supply	220V DC 20 Amp	1
2	Three point starter	Suitable for 3HP DC shunt motor	1
3	Tachometer	Suitable range around 0 to 500 rpm	1

XII Actual Procedure followed:

1. Connect the circuit as shown in circuit diagram
2. Switch on DC supply
3. Move the handle of 3 point starter from start to Run position gradually
4. observe the starting of DC shunt motor
5. By using techometer measure the speed of the DC shunt motor

XIII Observations:

Sr. No.	Speed of DC shunt motor in RPM
1	1450
2	1460

XIV Results:

The speed of the DC shunt motor measured using tachometer was found to be in the range of 1450 - 1460 RPM., which is close to its rated speed

XV Interpretation of results:

The DC shunt motor was successfully started using the 3 point ~~indicating proper operation~~ Starter.

VI Conclusion and recommendation

The experiment demonstrates that a DC shunt motor can be smoothly using a 3point starter. The measured speed of motor aligns with its expected performances

VII Practical related questions (Provide space for answers)

1. State types of starters used for DC motors.
2. Starter is necessary for starting of DC motors.
3. Write the functions of different parts of three point starter.

1.) Two-point starter: for sexies motors
Three point Starter: for shunt and compound motors
four-point starter: for compound motor with a no-volt release coil independent of the handle

2) Yes, a starter is necessary to:
- Limit the higher starting current that can damage the motor windings
- Gradully build up the speed of the motor
- Protect the motor form overload and open circuit conditions

3) ~~Write the f~~ —>
- Handle: Used to move the starter arm from start to Run position
- Overload Release coil (OLR): protects the motor from overloads by disconnecting the supply.
- No-Volt Release coil (NVR): Disconnects the supply when the field current drops or if the handle move back to the start position