

Practical No. 9: Reverse the direction of rotation of universal motor.

I Practical Significance:

Reversal of rotation of Universal motor plays an important role in electrical and electronic engineering for different medical instrumentation applications.

II Industry/Employer Expected Outcome(s)

Use universal motor for different applications. Reverse the direction of rotation of universal motor.

III Course Level Learning Outcome(s)

Use different electrical machines by making connections.

IV Laboratory Learning Outcome(s)

LLO Speed reversal of universal motor.

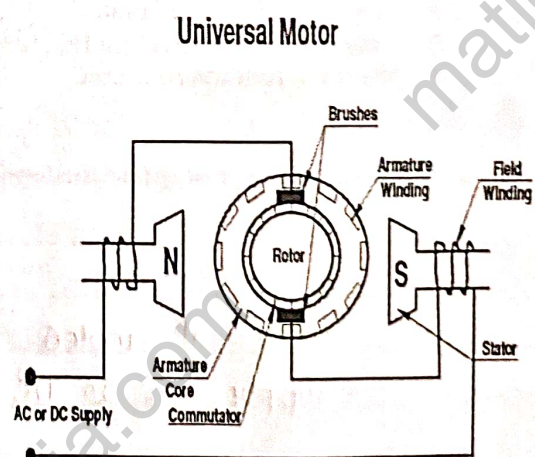
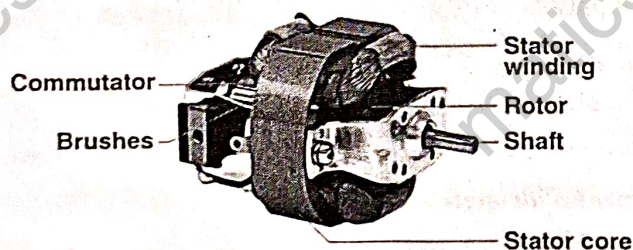
V Relevant Affective Domain related outcome(s)

Follow safety electrical rules for safe practices.

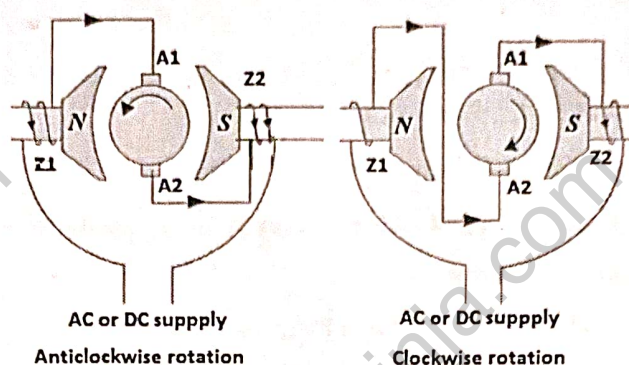
VI Relevant Theoretical Background

Universal motor can be operated on AC and DC supply. It consists of armature, armature winding, field winding, armature winding and field winding are connected in series with each other since this is basically a series motor.

The direction of rotation of a universal motor can be changed by either: (i) Reversing the field connection with respect to those of armature; or (ii) By using two field windings wound on the core in opposite directions so that the one connected in series with armature gives clockwise rotation, while the other in series with the armature gives counterclockwise rotation.



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	Universal motor	Suitable rating	1
2	Supply AC or DC	Suitable supply	1

IX Precautions to be followed:

1. All electrical connections should be neat and tight.
2. Check the power supply before connection.

X Procedure

1. Connect universal motor to AC/DC supply.
2. Mark the rotation of motor.
3. Change the armature winding terminal.
4. Mark the rotation of motor.

XI Required Resources/apparatus/equipment with specification:

S. No.	Name of Resource	Suggested Broad Specification	Quantity
1	Universal motor	Suitable rating	
2	Supply AC or DC	Suitable supply	

XII Actual Procedure Followed:

- 1] connect the universal motor to AC / DC supply.
- 2] Mark the rotation of motor.
- 3] ~~change the~~ change the armature winding terminal.
- 4] Mark the rotation of motor.

XIII Observations:

Sr. No.	Winding connection	Direction of rotation
1	Normal	Anticlock wise rotation.
2	Reversed	clockwise rotation.

XIV Results:

We observe that universal motor operates static function AC supply as well as DC supply reverse the direction of universal motor can be changed by changing terminal.

XV Interpretation of results:

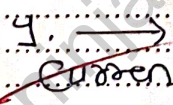
The universal motor works satisfactorily on both AC & DC supply when connection is normal the motor start to rotate in anticlockwise direction.

XVI Conclusion and recommendation

Hence, we have learned How to Reverse the direction of rotation of universal motor.

XVII Practical related questions (Provide space for answers)

1. State working of universal motor.
2. State main parts of State different types of single phase induction motors.
3. Give applications of universal motor.

4.  A Universal motor works by using electric current to create magnetic field.

armature spin. It can run on both AC (alternating current) & DC (direct current) power. The commutator current di. helps keep the motor spinning by reversing the current direction as needed. These motors are used in appliances like vacuums, cleaners, and power tools.

Q] →?

→ Main parts of a single-phase Induction Motor:

1] Stator - Stationary part creating the magnetic field.

2] Rotor - Rotating part influenced by the stator's magnetic field.

3] Bearings - Support the rotor.

4] Shaft - Transfers power from the motor.

5] Windings - Coils generating the magnetic field.

Types of single phase Induction motors.

1] Split-phase motor.

2] Capacitor-start motor.

3] Capacitor-run motor.

4] Shaded-pole motor.

5] PSC motor.

Q] →?

Universal motors are commonly used.

1] Vacuum cleaners.

2] Blenders & food processors.

3] Power tools.

4] Hair dryers.

5] Washing machines.

They are favored cause can run on AC & DC both power.

XVIII References/Suggestions for further reading:

1. www.electrical4u.com
2. www.howstuffworks.com
3. www.electricaltechnology.org