

Heaven's Light is Our Guide



Rajshahi University of Engineering & Technology

Department of Electrical & Computer Engineering

Lab Report

Experiment No: 04

Name of the experiment: Three phase sequence test using motor.

Course Code	ECE 1202
Course Title	Circuits and Systems-II Sessional
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4.1 Objective:

To understand the concept of phase sequence in three phase system and study the effect of phase sequence on the direction of rotation in six phase motor.

4.2 Theory:

In a three-phase electrical system, the phase sequence refers to the order in which the voltages of the three phases (a, b, C) reach their peak values. The sequence can be either forward (abc) or reverse (cba). This sequence directly impacts the direction of rotation in AC motors. In a six-phase motor, which consists of two sets of three-phase windings, the direction of rotation depends on the phase sequence of the input supply. A forward sequence results in clockwise rotation, while reversing the sequence causes counterclockwise rotation.

4.3 Required Apparatus:

1. Source
2. VARIAC
3. Six-phase motor
4. Connecting wires

4.4 Circuit Diagram:

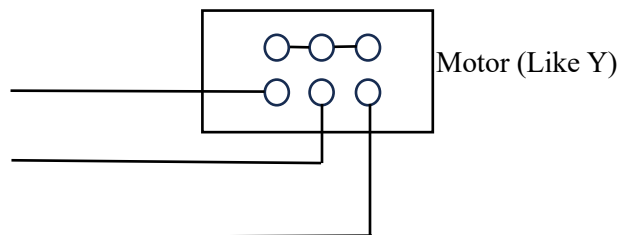


Fig. 4.2: Circuit diagram

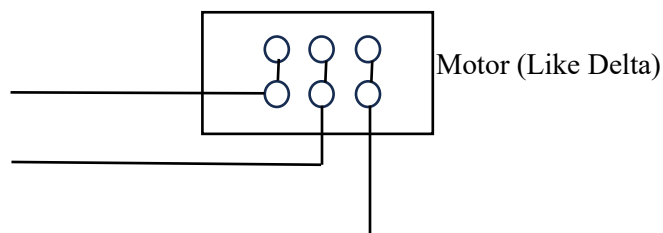


Fig. 4.2: Circuit diagram

4.5 Procedure:

The circuit was built according to the diagram and the readings were collected several times for verification.

4.6 Result:

At first the motor rotated clock-wise that is the sequence was positive or abc.

Then after swapping two of the connection the motor rotated anti clock-wise that is the sequence was negative or acb.

4.7 Discussion:

The experiment shows that altering the phase sequence changes the motor's direction of rotation. A forward sequence (abc) causes clockwise rotation, while a reverse sequence (cba) results in counterclockwise rotation. This confirms the critical role of phase sequence in motor control, as incorrect sequencing can lead to undesired motor behavior or even damage. The six-phase motor's response demonstrates the importance of verifying the correct phase sequence in three-phase systems to ensure proper operation in industrial applications.

4.8 Precautions:

1. The connections were made carefully and were double checked
2. The AC voltage source and variac were handled with care maintaining safety measures.

4.9 Reference:

- (i) Charles K. Alexandar and Matthew N. O. Sadiku, "Fundamentals of Electric Circuit", 5th Edition, 1221 Avenue of the Americas, New York
- (ii) Wikipedia