Heaven's Light is Our Guide

Rajshahi University of Engineering & Technology

Department of Electrical & Computer Engineering

Lab Report

Experiment No: 01

Name of the experiment: Study the relationship between phase voltage and line voltage of a wye (Y) connected 3-phase balanced system.

Course Code	ECE 1201
Course Title	Circuit & Systems II Sessoinal
Date of experiment	14.05.2024
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Submitted By:	Submitted To:
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Experiment No: 01

1. Name of The Experiment: Study the relationship between phase voltage and line voltage of wye connected 3-phase balanced system.

2. Objectives: This lab's goal is to examine and validate the theoretical relationship in a balanced Wye-connected three-phase system between the line and phase voltages.

3. Theory:

In a balanced Wye-connected system:

- **Phase Voltage:** The voltage across each individual winding or phase.
- **Line Voltage:** The voltage between any two lines.

The theoretical connection in a Wye connected system is,

$$V_{line} = \sqrt{3} \oplus V_{ph}$$

which represents the relationship between the line and phase voltages. Since two phase voltages spaced 120 degrees apart equal the vector sum of the line voltage, this connection results.

4. Required Apparatus:

4.1. Ammeter
4.2. Voltmeter
4.3. Multimeter
4.4. Source
4.5. Connecting wires
4.6. Resistors

5. Circuit Diagram:

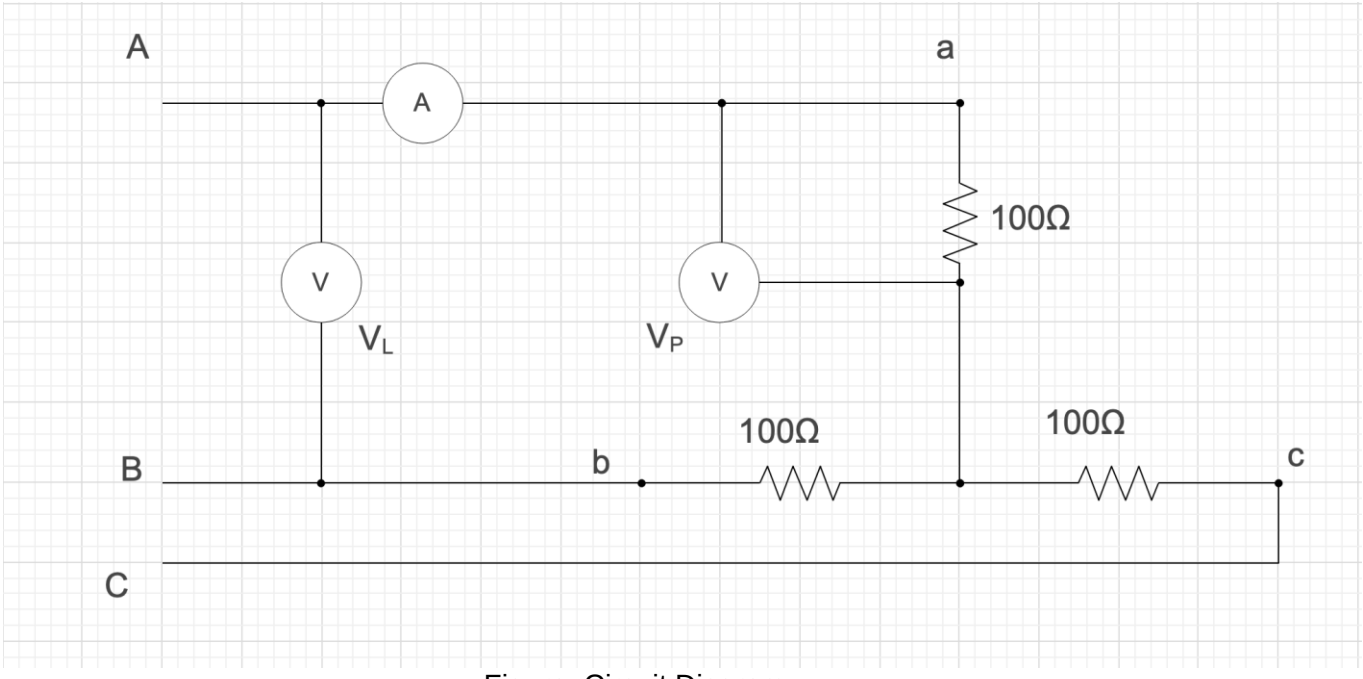

Figure: Circuit Diagram

6. Data Table & Result:

Sl No.	V_L (V)	V_p(m) (V)	V_p(cal) (V)	I_L (A)	I_P (A)	Error(%)$e = \frac{\lvert V_P - V_M \rvert}{V_P} \times 100$
01	98.90	55.80	57.10	0.55	0.55	2.39
02	71.00	39.90	41.00	0.39	0.39	2.75
03	124.50	70.10	71.88	0.70	0.70	2.53

$$V_P = V_L/\sqrt{3}$$

7. Discussion:

The results we had gotten from the experiment were exactly what were anticipated. However, due to few mechanical and mathematical errors, they had not been precise. It had occasionally taken many attempts to finish the experiment because sometimes experiment materials seemed to be faulty and was used by the experimenters incorrectly, which had led to incorrect calculations and results. If everything was flawless, the outcome would be precisely correct as per the theory.

8. Precautions:

i. All connection should be perfectly connected.

ii. Before connecting the instruments check their zero reading.

iii. The terminal of the resistance should be properly connected.

9. Reference:

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