Heaven's Light is Our Guide

Rajshahi University of Engineering & Technology

Course Title

Circuit and System -II Sessional

Course No : ECE 1202

Lab Report No : 02

Date of Submission :**16-09-2024**

Experiment No : 02

Experiment Nme :

Study the relationship between phase & line current & voltage of a Delta connected three phase balanced system.

Submitted To:	Submitted By:
Oishi Jyoti Assistant Professor Dept. Of Electrical & Computer Engineering	Name :Mahmudul Hasan Roll :2210057 Registration :1111 Session :2022-2023 Department of ECE,RUET

INDEX

SL	Name	Page No
1	Eperiment No	1
2	Experiment Nme	1
3	Objectives	1
4	Required Apparatus	1
5	Theory	1
6	Circuit	1
7	Procedure	2
8	Calculation	2
9	Data Table	2
10	Result	2
11	Discussion	2

Eperiment No:02

Name of The Experiment: Study the relationship between phase & line current & voltage of a Delta connected three phase balanced system.

Objectives:

1. To learn how to make delta connections.
2. To study the relationship between voltage and current in three phase circuits

Required Apparatus:

1. Voltmeter
2. Ac Voltage Source
3. Ammeter
4. Resistors
5. Connecting Wires

Theory:

Within a three-phase system connected by a delta, the relationship between the line and phase values is as follows:

$$V_P = V_L$$

$$\text{And} \quad I_p = I_L/\sqrt{3}$$

where I_p & I_L represent phase & line current, and V_P & I_L represent phase and line voltages, respectively

Circuit Diagram:

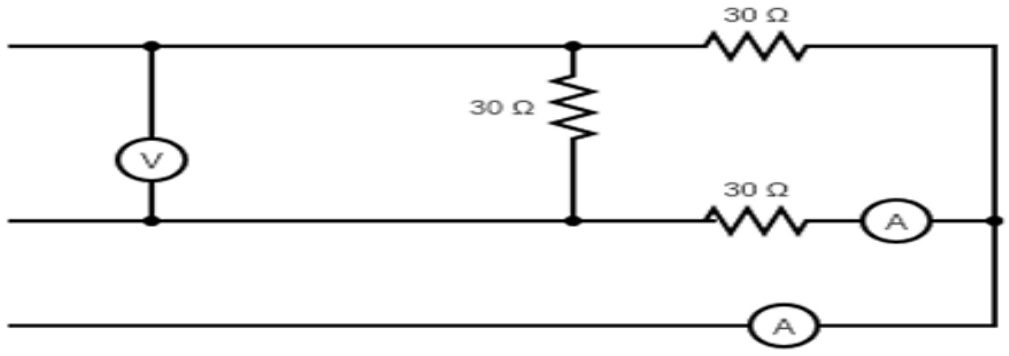


Fig.1: Circuit Diagram

Procedure:

1. Using the necessary components, a circuit was built by following the circuit diagram.

2. The ammeter and voltmeter were connected according to the diagram.

3. Voltmeter and ammeter readings were recorded into a data table, and an error calculation was made.

Calculation:

For the 1st one:

I_L = 1.5 A , I_P (c) = I_L / 3 = 0.86 A , I_P (m)= 0.8 A, Error = 6.97%

For the 2nd one:

I_L= 2.3 A, I_P (c) =I_L / 3 = 1.32 A, I_P (m) = 1.2 A , Error =9.09%

For the 3rd one:

I_L = 3.8 A, I_P (c) =I_L / 3 = 2.19 A, I_P(m) = 2.1 A, Error =4.11%

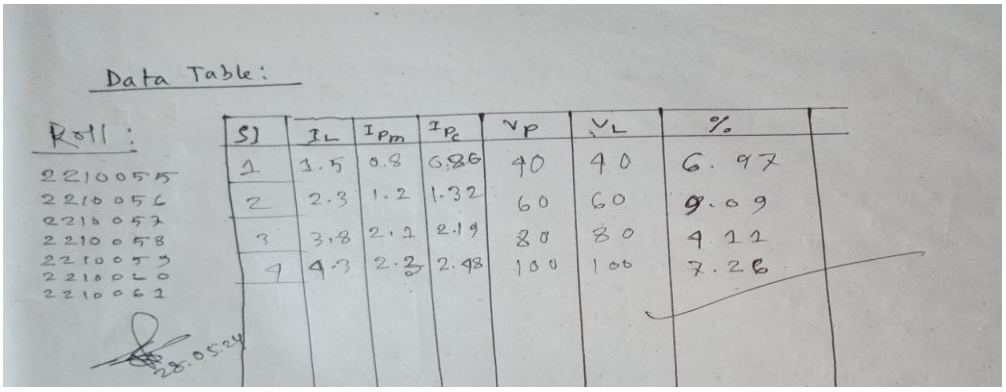
For the 4th one:

I_L = 4.3 A, I_P (c)=I_L / 3 = 2.48 A, I_P (m)= 2.3 A, Error =7.26%

Data Table:

SL No	V_L	V_P	I_P(c)	I_L	I_P(m)	Error(%)
1	40	40	0.86	1.5	0.8	6.97
2	60	60	1.32	2.3	1.2	9.09
3	80	80	2.19	3.8	2.1	4.11
4	100	100	2.48	4.3	2.3	7.26

Data From Lab:



Result:

From the data table ,we can see that the result is almost same as we expected though it shows some error but that was very small.So it can be said that ,

$$I_p = I_L/\sqrt{3}$$

& line voltage is equal to phase voltage $V_P = V_L$

Discussion:

The experiment successfully verified the relationship between line current and phase current in a balanced, delta-connected three-phase system. The calculated line current roughly matches the values found in theory.