Heaven's Light is Our Guide

Rajshahi University of Engineering & Technology

Department of Electrical & Computer Engineering

Lab Report

Course Code	**ECE 1202**
Course Title	Circuits and Systems II Sessional
Date of Submission	03-09-2024

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Name of the Experiment: Study the relation between line current and phase current of a delta connected 3 phase balanced system.

Theory: In a balanced three-phase system, the three-phase voltages have the same magnitude and are displaced by 120 degrees from each other. In a delta-connected system, Phase Current (I_P) is the current flowing through each winding of the delta connection and Line Current(I_L) is the current flowing through each line conductor supplying the delta load. In a delta-connected system, the current relationships differ from those in a wye connection. For a balanced three-phase system, line current is equal to the phase current multiplied by $\sqrt{3}$ in a delta connection. Mathematically,

$$I_L = \sqrt{3} * I_P$$

$$V_L = V_P$$

Circuit diagram:

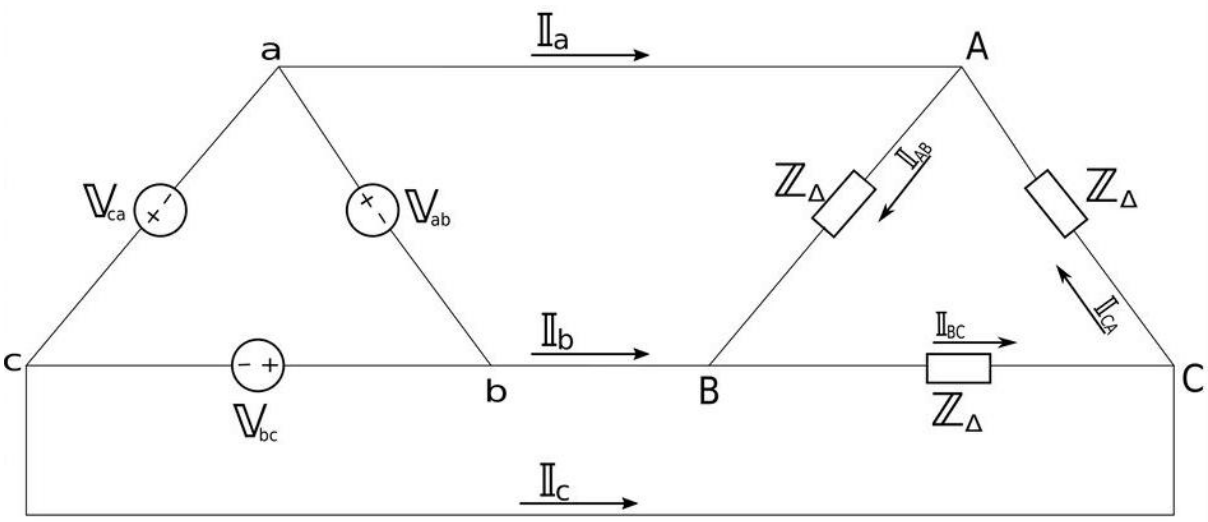

Fig:01

Required Apparatus:

1. Source

2. Ammeter

3. Resistor

4. Multimeter

5. Connecting Wire

Data Table:

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

Calculation:

For the 1st one:

I_L = 1.5 A , I_P(c) = $I_L / \sqrt{3} = 0.86\ A$, I_P(m)= 0.8 A, Error = 6.97%

For the 2nd one:

I_L= 2.3 A, I_P(c) =$I_L/\sqrt{3} = 1.32\ A$, I_P(m) = 1.2 A , Error =9.09%

For the 3rd one:

I_L = 3.8 A, I_P(c) =$I_L/\sqrt{3} = 2.19\ A$, I_P(m) = 2.1 A, Error =4.11%

For the 4th one:

I_L = 4.3 A, I_P(c)=$I_L/\sqrt{3} = 2.48\ A$, I_P(m)= 2.3 A, Error =7.26%

Conclusion:

The measured line current and phase current values were found to be consistent with theoretical calculations. The experimental results validated the theoretical relationships between line and phase currents in a delta-connected system.