"Heaven's Light is Our Guide"

Rajshahi University of Engineering & Technology

Rajshahi, Bangladesh

Department of Electrical & Computer Engineering

Course Code: ECE 1205

Course Title: Circuits and systems Sessional-II

LAB REPORT-2

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Experiment No :2
Experiment Name: Study the relationship between phase and line Currents of a delta connected 3-phase balanced system.

Objective:

i. To examine and determine phase and line currents of a balanced 3-phase delta connection
ii. To verify the relation between phase and line current. Also verify the relation of phase and line currents according to the formula.

Theory:

3-Phase balanced system is a polyphase system where three voltage sources produce voltages with same magnitude but the phases differ from one another by 120 degrees. Loads with same impedance can be connected with a 3-phase balanced system in two configuration Wye(Y) and Delta. In this experiment, delta configuration is observed. In a poly phase system line voltage is the potential difference between two lines and phase voltage is the potential difference between a phase and the neutral junction. The current flowing in the line is called line current and current flowing in one of the windings of the generator is called phase current. The relationship between line current (I_L) and phase current (I_P) is:

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

And, $V_P = V_L$

Diagram:

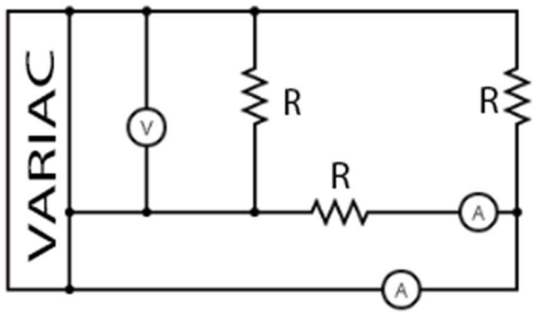

Fig.1: Delta connection of a 3-phase system.

Required Apparatus:

1.Source

2. Ammeter

3.Resistor (Three)

4.Connecting Wire

5.Multimeter

Data Table:

SL	I_L	I_P(cal)	I_P(M)	V_p	V_L	Error
1	0.65	0.375	0.38	39.3	39.3	1.31%
2	2.39	1.38	1.32	42	42	4.34%
3	1.73	0.99	0.95	30.6	30.6	4.04%
4	2.7	1.55	1.52	48	48	1.93%
5	1.18	0.68	0.64	20.95	20.95	5.8%

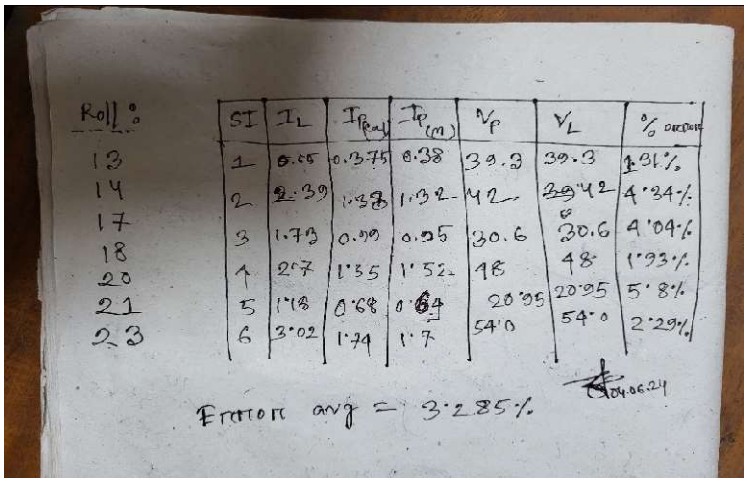

Fig.2: Table from lab

Calculation:

For phase current,

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

for phase voltage, $V_p = V_L$

error = 3.285%

Result:

The relation between phase current and line current was according to the theory. But there was 3.285% error in relation. Also the phase voltage and line voltage were equal.