*Heaven's Light is Our Guide*

# Rajshahi University of Engineering & Technology

**Department of Electrical & Computer Engineering**

# Lab Report

Experiment No: 02

Name of the experiment: Study the relationship between phase & line current & voltage of a Delta (Δ) connected three-phase balanced system.

| | |
|---|---|
| Course Code | 1202 |
| Course Title | Circuit & System – II Sessional |

| **Submitted By:** | **Submitted To:** |
|---|---|
| Name : Sharmin Akter<br>Roll : 2210055<br>Registration : 1109<br>Session : 2022-23 | Oishi Jyoti,<br>Lecturer.<br>Electrical & Computer Engineering, RUET. |

# INDEX

**Experiment No:** 01
**Name of the Experiment:** Study the relationship between phase & line current & voltage of a Delta (Δ) connected three-phase balanced system.
**Objectives:**
- To learn how to make Delta (Δ) connections
- To study the relationship between voltage & current in three-phase system

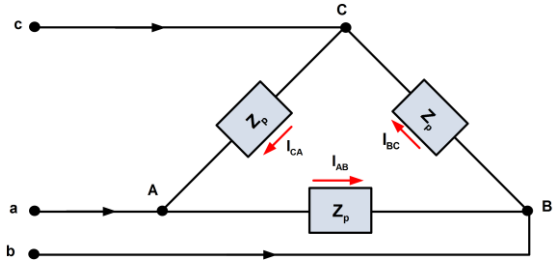
**Required Apparatus:**
- Voltmeter
- AC Voltage source
- Ammeter
- Connecting wires
- Resistors

**Theory:** In a Delta (Δ) connected three-phase system, the line and phase quantities are related by,

$$\boldsymbol{V_p = V_L}$$
$$\boldsymbol{I_p = I_L/\sqrt{3}}$$

Where $V_p$ is phase voltage, $V_L$ line voltage. $I_L$ & $I_p$ are line current & phase current respectively.

**Circuit Diagram:**



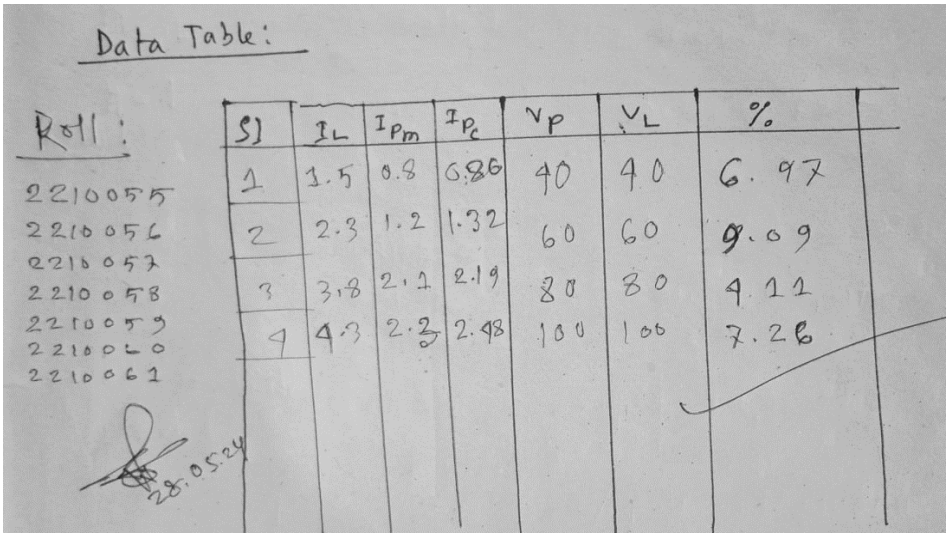

**Procedure:**
- A circuit was created following the circuit diagram using the components required.
- Voltmeter and ammeter were connected in the places marked in the diagram.
- Readings of the meters were recorded in a data table and error was calculated.

**Calculations:**
Delta Connection, Vp = $V_L$; finding errors for $I_L$ & $I_p$
For 1,
Ip(c) = 1.5/√3 = 0.86
Error = (0.86-0.8)/0.86
= 6.97%

For 2,
Ip(c) = 2.3/√3 = 1.32
Error = (1.32-1.2)/1.32
= 9.09%
For 3,
Ip(c) = 3.8/√3 = 2.19
Error = (2.19-2.1)/2.19
= 4.11%
For 4,
Ip(c) = 4.3/√3 = 2.48
Error = (2.48-2.3)/2.48
= 7.26%

**Data Table:**

| SI | $I_L$ | Ip(m) | Ip(c) | $V_L$ | Vp | 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%** |




**Result:**

The measured line and phase voltages are the same as it was a Delta (Δ) connection. But the relation between line and phase current is - $\boldsymbol{I_p = I_L/\sqrt{3}}$ as it can be seen from the calculations.

**Discussion:**

Ignoring the small margin of error, the experiment proved the theory. Error could have been avoided but due to some external & internal factors it was unavoidable.