

*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 & Systems - II Sessional

**Date of experiment** : 04/06/2024

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Submitted To:	Submitted By:
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## 2.1 Experiment No. : 02

**2.2 Name of the Experiment:** Study the relation between phase and line current of Del (wye-delta system) connected three phase balanced load.

### 2.3 Theory:

In balanced “Delta” circuits, the line current is equal to phase current times the square root of 3, while the line voltage is equal to phase voltage.

The magnitude of the line current  $I_L$  is  $\sqrt{3}$  times the magnitude of the current  $I_p$

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

The Phase voltage is equal to line voltage

$$V_p = V_L$$

### 2.4 Circuit Diagram :

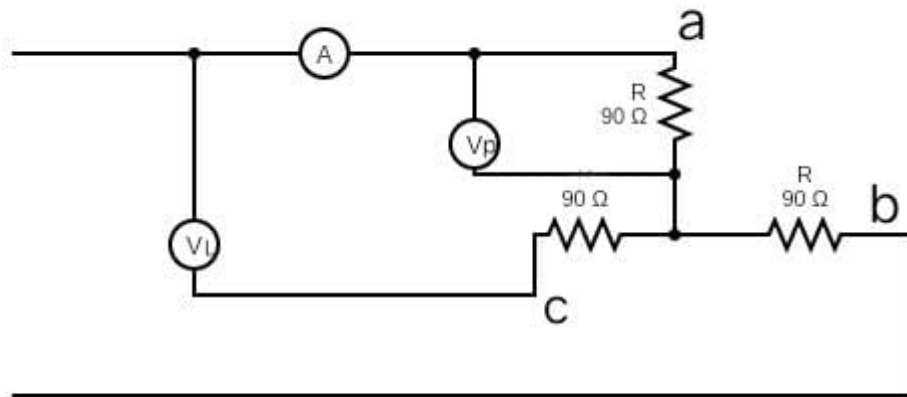


Fig. --01-- Circuit Diagram wye-delta connected system .

### 2.5 Required Apparatus:

1. AC voltage source
2. step-down transformer.
3. Resistor . (3 pieces )
4. Connecting wires.
5. Ammeter .
6. Voltmeter .
7. Multimeter .

## 2.6 Data Table:

Sl	I <sub>L</sub>	I <sub>P(m)</sub>	I <sub>P(cal)</sub>	% error	V <sub>L</sub>	V <sub>P</sub>
1	0.65 A	0.38 A	0.375 A	1.31 %	39.3 V	39.3 V
2	2.39 A	1.32 A	1.38 A	4.43 %	42 V	42 V
3	1.73 A	0.95 A	0.99 A	4.04 %	30.6 V	30.6 V
4	2.7 A	1.52 A	1.55 A	1.93 %	48 V	48 V
5	1.18 A	0.64 A	0.68 A	5.8 %	20.95 V	20.95 V
6	3.02 A	1.7 A	1.74 A	2.29 %	54 V	54 V

## 2.7 Data table from lab Experiment:

Roll No	Sl	I <sub>L</sub>	I <sub>P(cal)</sub>	I <sub>P(m)</sub>	V <sub>P</sub>	V <sub>L</sub>	% error
13	1	0.65	0.375	0.38	39.3	39.3	1.31%
14	2	2.39	1.38	1.32	42	39.42	4.34%
17	3	1.73	0.99	0.95	30.6	30.6	4.04%
18	4	2.7	1.55	1.52	48	48	1.93%
20	5	1.18	0.68	0.64	20.95	20.95	5.8%
21	6	3.02	1.74	1.7	54.0	54.0	2.29%
23							

Error avg = 3.285%

Signature: 04.06.24

## 2.9 Result:

Because of having different limitations, some errors have been found. From the experiment we can come to the decision that the relation between phase and line voltage and current is correct and applicable .  $V_L = \sqrt{3} V_P$   $I_P = I_L$

$$\text{Average \% of error} = \frac{1.31+4.43+4.04+1.93+5.8+2.29}{6} \%$$

$$= 3.285 \%$$

### **2.10 Discussion:**

1. For the 1<sup>st</sup> Time I make the arrangement of “Delta” connected balanced load .
2. learn to handle three phase .

### **2.11 Precaution:**

1. Low voltage source should be used for this experiment to avoid risks.
2. Wires should be connected properly.
3. We should keep ourself away from wire when line is ON .

**2.12 Reference:** Fundamentals of Electric Circuits by Charles K. Alexander & Matthew N. O. Sadiku.