Heaven's Light is Our Guide

Rajshahi University of Engineering & Technology

Department of Electrical & Computer Engineering

Lab report -03

Course Code : **ECE 1202**

Course Title : **Circuits and Systems-II Sessional**

Date of Experiment : **10-09-2024**

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Submitted To:	Submitted By:
Oishi Jyoti **Assistant Professor** **Department of ECE, RUET**	**Name** : **Md Adib Hasan** **Roll** : **2210011** **Registration** : **1065** **Session** : **2022-2023** **Department of ECE, RUET**

Experiment Number: 03 Date: 10-09-2024

1. Experiment Name: Power measurement of a balanced 3 Phase system using two wattmeter method.

2. Objectives: To measure the power in a balanced 3-phase system using the two-wattmeter method and to understand how total power can be determined by summing the readings from two wattmeter.

3. Theory:

In a balanced three-phase system, the two-wattmeter method can be used to calculate the total power required by the load. This method involves connecting two watt meters to any two lines of a three-phase system. The measurements from the two wattmeters are then utilized to calculate the system's overall power. The total power (P) is equal to the sum of the two wattmeter readings (W1 and W2), which is calculated as Total Power = W1 + W2.

In the case of a balanced load, the power factor can also be calculated using the wattmeter reading ratio. The two-wattmeter method is useful since it considers both real and reactive power. It is a common approach for calculating power in delta and wye-connected systems with balanced loads.

4. Required Apparatus:

1. Variac
2. Ammeter
3. Resistor
4. Multimeter
5. Voltmeter
6. Wattmeter
7. Connecting Wire

5. Circuit Diagram:

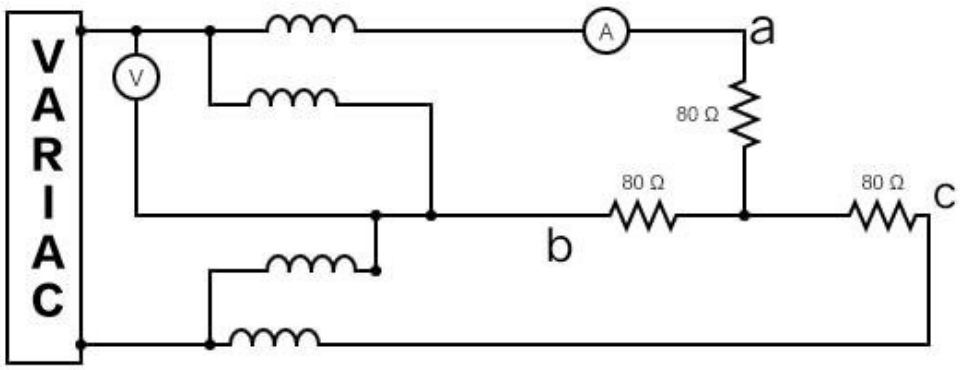
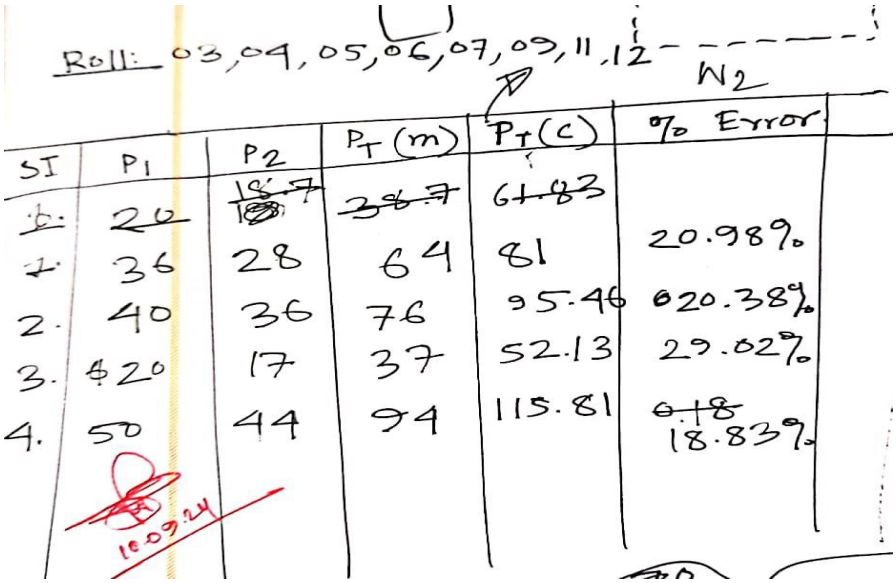


Fig 1: Power measurement of a Delta Connected System

6. Data table:

Sl. No.	P_1	P_2	P_T (M)	P_T (C)	Error (%)
1.	36	28	64	81.00	20.98
2.	40	36	76	95.46	20.38
3.	20	17	37	52.13	29.02
4.	50	44	94	115.8	18.83

7. Data Table from lab Experiment:



8. Result:

Following the experiment, we discovered that the total power measured with the two-wattmeter method corresponded precisely to the theoretical power estimate. There were some mistakes due to late data collection and heating difficulties in the equipment, but the link between wattmeter readings and total power was validated.

9. Discussion:

1. I learned how to operate a three-phase balanced wye linked circuit.
2. I learned how to take measurements without being shocked by an AC circuit.
3. I learned that late data collection leads to higher mistake rates.