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:
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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 3-phase system, the total power consumed by the load can be measured using the two-wattmeter method. This method is based on connecting two wattmeter to any two lines of a three-phase system. The readings on the two wattmeter are then used to calculate the total power of the system. The total power (P) is the sum of the two wattmeter readings (W1 and W2), i.e.,
Total Power = W1 + W2.

In the case of a balanced load, the power factor can also be determined by the ratio of the wattmeter readings. The two-wattmeter method is effective because it accounts for both real and reactive power. For balanced loads, it is a standard method for determining the power in both delta and wye-connected systems.

4. Required Apparatus:

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

5. Circuit Diagram:

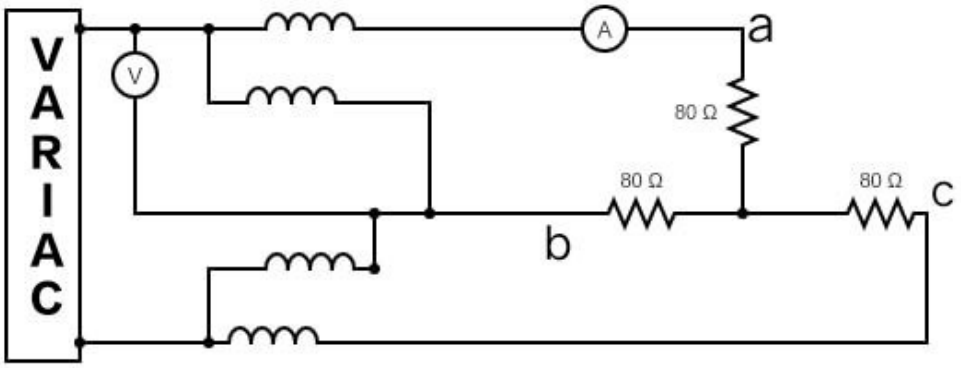
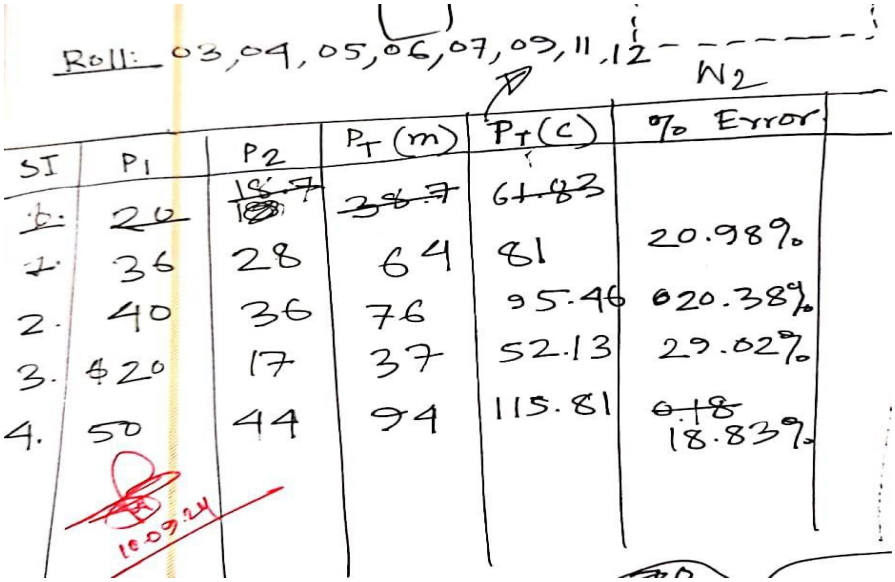


Fig 1: Power measurement of a Delta Connected System

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:

After conducting the experiment, we found that the total power measured using the two-wattmeter method corresponds accurately with the theoretical power calculation. Some errors were observed due to late data taking and heating issues in equipment, but the relationship between the wattmeter readings and the total power was validated.

9. Discussion:

1. I have learnt to operate a balanced wye connected 3 phase circuit.
2. I learnt to take measure without getting a major shock from AC circuit.
3. I learnt a important thing that: As much as we late to take data the error is getting high .

10. References:

1. Alexander, Charles K. Sadiku, Matthew N.O. *Fundamentals of electric circuits*. 7th ed New York: McGraw-Hill, 2020.

2. *Wikipedia.com*