"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 :3
Experiment Name: Power measurement of a balanced 3 phase system using two wattmeter method.

Objective:

i. To examine and determine the power of the line using two wattmeter and see if it is according to the calculated value.

Theory:

The two-wattmeter method can be used to measure the power in a balanced three-phase system. In this case, the total power is the sum of the individual wattmeter readings. Again the calculated power can be measured from the relation,

$P = \sqrt{3} I_L V_L$

Diagram:

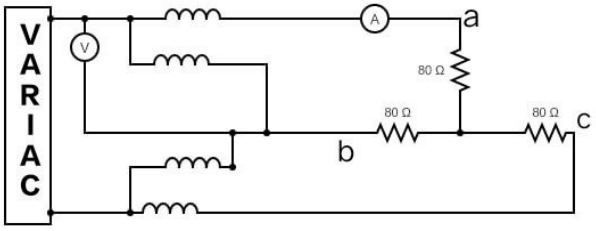


Fig.1: Two wattmeter connection of a 3-phase system.

Required Apparatus:

1.Source

2. Ammeter

3.Resistor (Three)

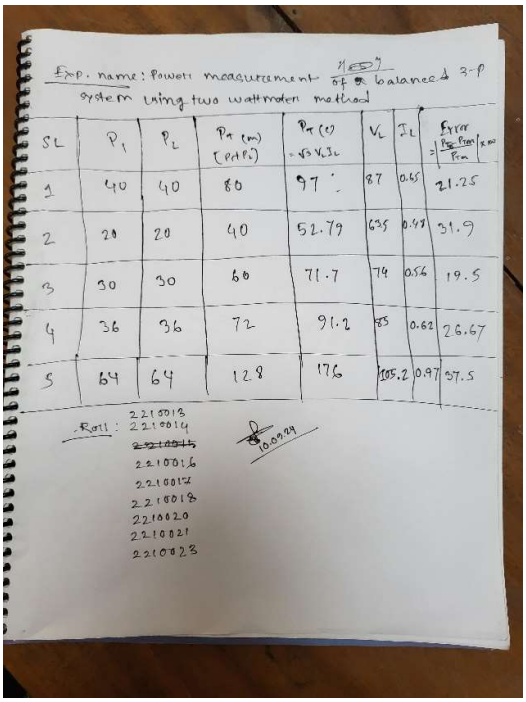
4.Connecting Wire

5.Multimeter

6.Two wattmeters

Data Table:

SL	I_L	V_L	P_1	P_2	P_T(Experiment)	P_T(Calculated)	Error
1	0.65	87	40	40	80	97	21.25%
2	0.48	63.5	20	20	40	52.8	31.9%
3	0.56	74	30	30	60	71.7	19.5%
4	0.62	85	36	36	72	91.2	26.67%
5	0.97	105.2	64	64	128	176	37.5%



Exp. name: Power measurement of a balanced 3-P system using two wattmeter method

SL	P_1	P_2	P_T (m) (P_1+P_2)	P_T (c) $\sqrt{3}V_L I_L$	V_L	I_L	Error = $\frac{P_T \text{ from } P_T}{P_T} \times 100$
1	40	40	80	97	87	0.65	21.25
2	20	20	40	52.79	695	0.44	31.9
3	30	30	60	71.7	74	0.56	19.5
4	36	36	72	91.2	85	0.62	26.67
5	64	64	128	176	105.2	0.97	37.5

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Fig.2: Table from lab

Calculation:

Power, $P = \sqrt{3} I_L V_L$

$$\text{Error} = \frac{21.25\% + 31.9\% + 19.5\% + 26.67\% + 37.5\%}{5} = 27.364\%$$

Result:

The power calculated and obtained from the experiment vary from each other. The error for this experiment is 27.364% which is a big percentage. It may be caused due to the low efficiency of the component used.