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 current and line current of delta connected 3-phase balanced system.

Course Code	ECE 1202
Course Title	**Circuits and Systems-II Sessional**
Date of experiment	28-05-2024
Date of Submission	03-09-2024

Submitted By:	**Submitted To:**
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Experiment No: 02

Name of the experiment: Study the relationship between phase current and line current of delta connected 3-phase balanced system.

2.1 Objective:

to analyze and establish the relationship between the phase current and the line current in a wye-connected 3-phase balanced system.

2.2 Theory:

Phase current is the current that flows through each phase of the load in a three-phase system.

Line current is the current that flows through each line connecting the power source to the load in a three-phase system.

In a delta connected three phase system, the relationship between line voltage and line current is:

$$V_P = V_L$$

Where V_P and V_L are phase voltage and line voltage respectively.

In a delta connected three phase system, the relationship between line voltage and line current is:

$$I_L = I_P$$

Where I_L and I_P are line current and phase current respectively.

2.3 Required Apparatus:

1. Ammeter
2. Voltmeter
3. Resistance
4. AC voltage source
5. Connecting wires
6. Multimeter

2.4 Circuit Diagram:

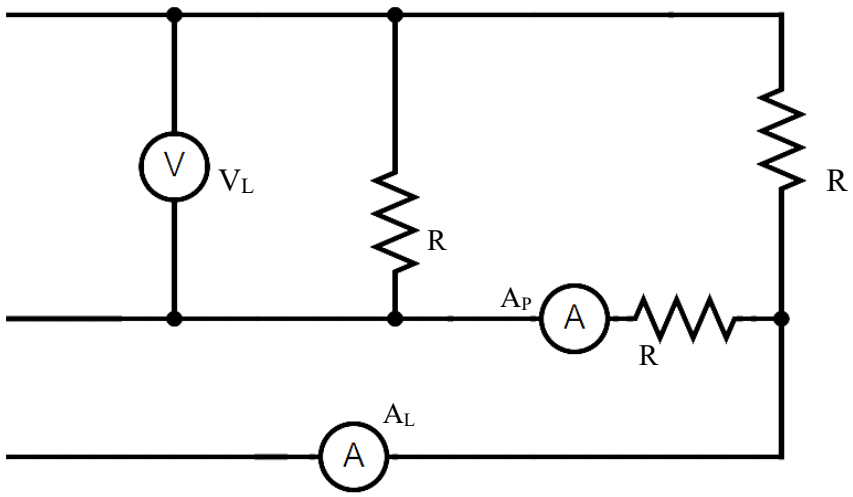


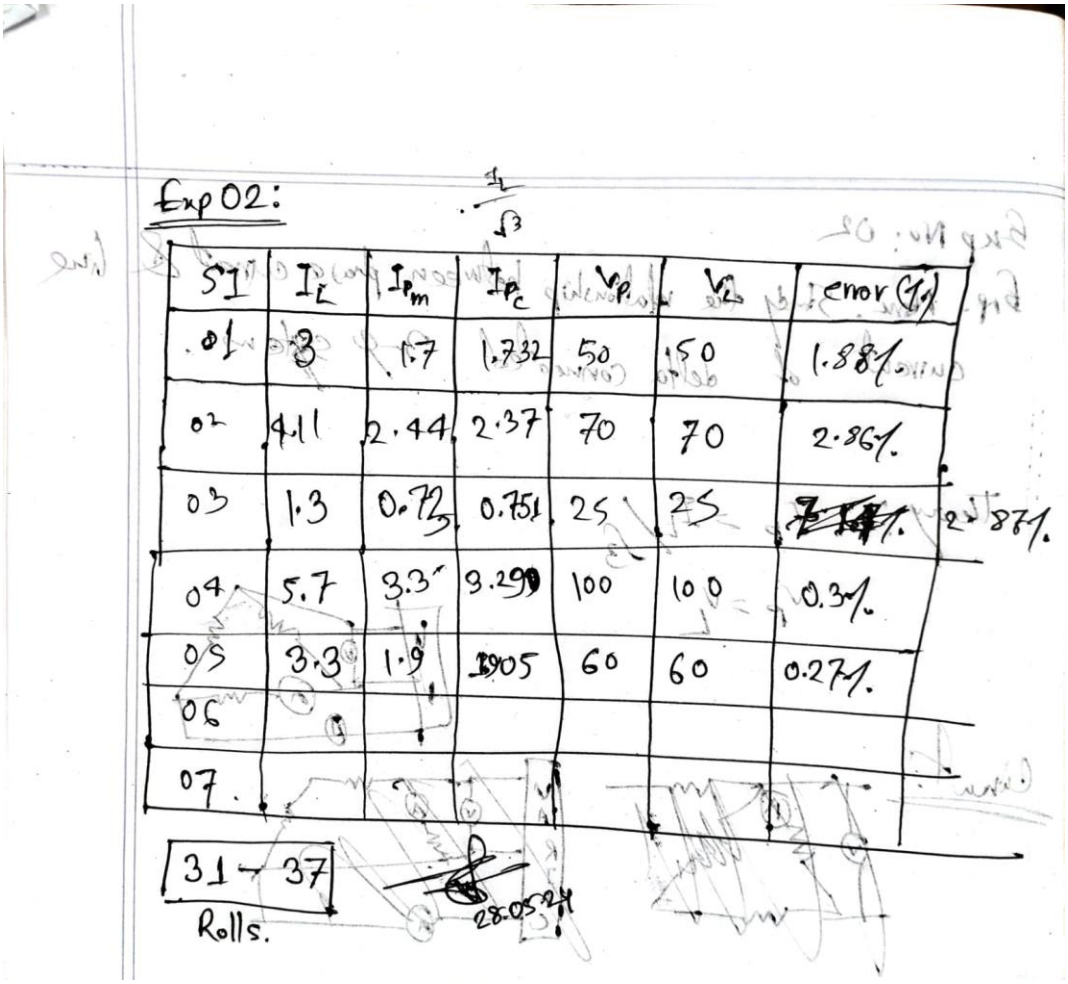
Fig. 2.1: Circuit diagram

2.5 Procedure:

The circuit was built according to the diagram and the readings were collected several times for verification.

2.6 Data Table:

Sl No.	I_L (A)	I_{Pm} (A)	I_{Pc} (A)	V_P (V)	V_L (V)	Error(%)
01	3	1.7	1.732	50	50	1.88
02	4.11	2.44	2.37	70	70	2.86
03	1.3	0.72	0.751	25	25	2.87



Exp 02:

S.I	I_L	I_{Pm}	I_{Pc}	V_P	V_L	Error (%)
01	3	1.7	1.732	50	50	1.88%
02	4.11	2.44	2.37	70	70	2.86%
03	1.3	0.72	0.751	25	25	2.87%
04	5.7	3.3	3.299	100	100	0.3%
05	3.3	1.9	1905	60	60	0.27%
06						
07						

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Rolls.

28.05.24

2.7 Discussion:

The experiment gave the results we expected, but it wasn't very accurate because of some problems with the machines and math mistakes. Sometimes it took several tries to complete the experiment because students sometimes connected the wires incorrectly, which led to wrong calculations. The theory says that if everything works perfectly, the results will be accurate. Even with these issues, the experiment still supported the theory.

2.8 Precautions:

1. The connections should be made carefully.
2. The AC voltage source should be handled with care maintaining safety measures.
3. The readings of voltmeter and ammeter should be taken as precisely as possible.

2.9 Reference:

(i) Charles K. Alexandar and Matthew N. O. Sadiku, “Fundamentals of Electric Circuit”, 5th Edition, 1221 Avenue of the Americas, New York

(ii) Wikipedia