



ABU DHABI UNIVERSITY

ELECTRIC CIRCUITS II

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# Lab Report 5

## Transformers

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**Section 1**

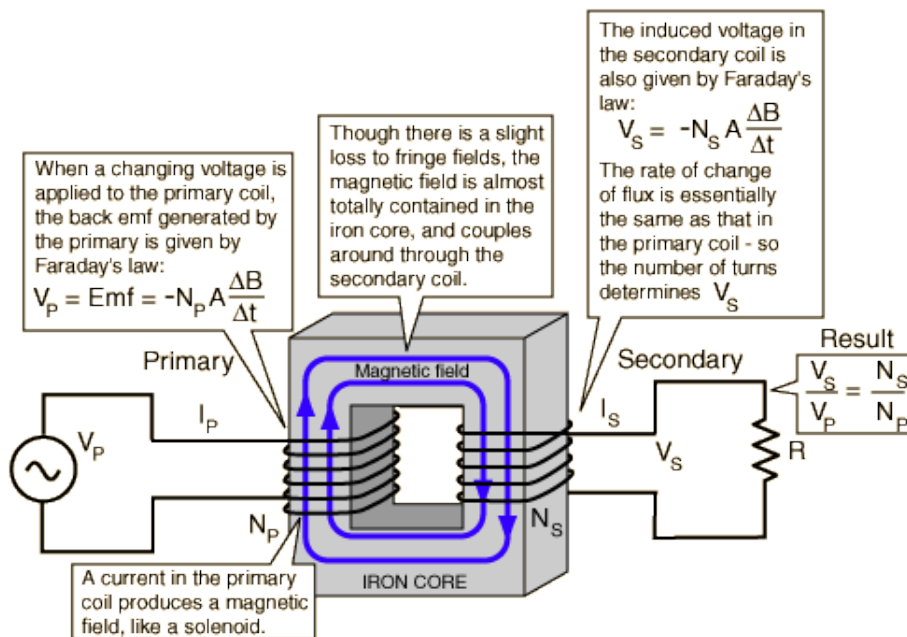
March 16, 2014

## Abstract

In this lab we were educated in current and voltage through a transformer.

## 1 Introduction

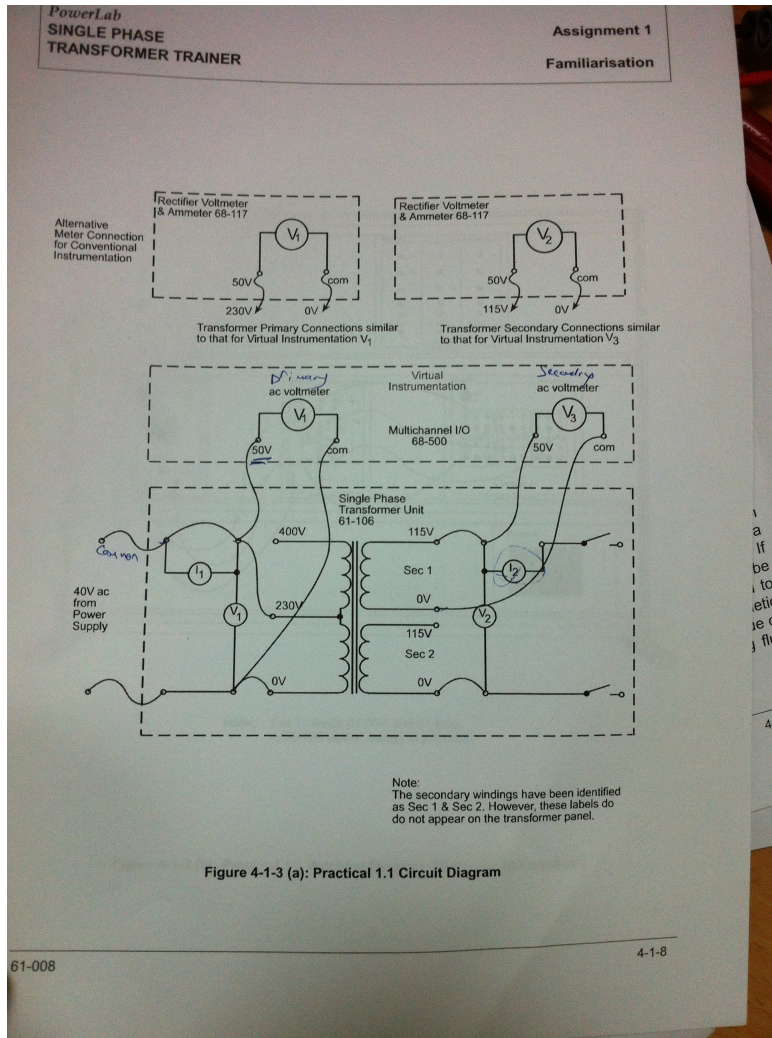
The basic transformer is nothing but two coils placed together linked by a closed core which passes through the two coils (primary and secondary). The primary coil is connected to the AC main supply, the core is made of iron or steel with lamination in between, laminations reduces the internal heating and the eddy current. When current from the main supply passes through the primary coil, flux will be generated and that flux will pass through the core. If the current supplied is constant, then constant flux will be generated while an alternating current will generate alternating flux, but a constant flux will not generate any current in the secondary coil. Once alternating voltage is applied at the primary coil, alternating flux will be generated in the core, and from this flux alternating voltage will be induced in the secondary coil, the value of this voltage will depend on the number of turns in both primary and secondary coils.



## 2 Experiment Set-up

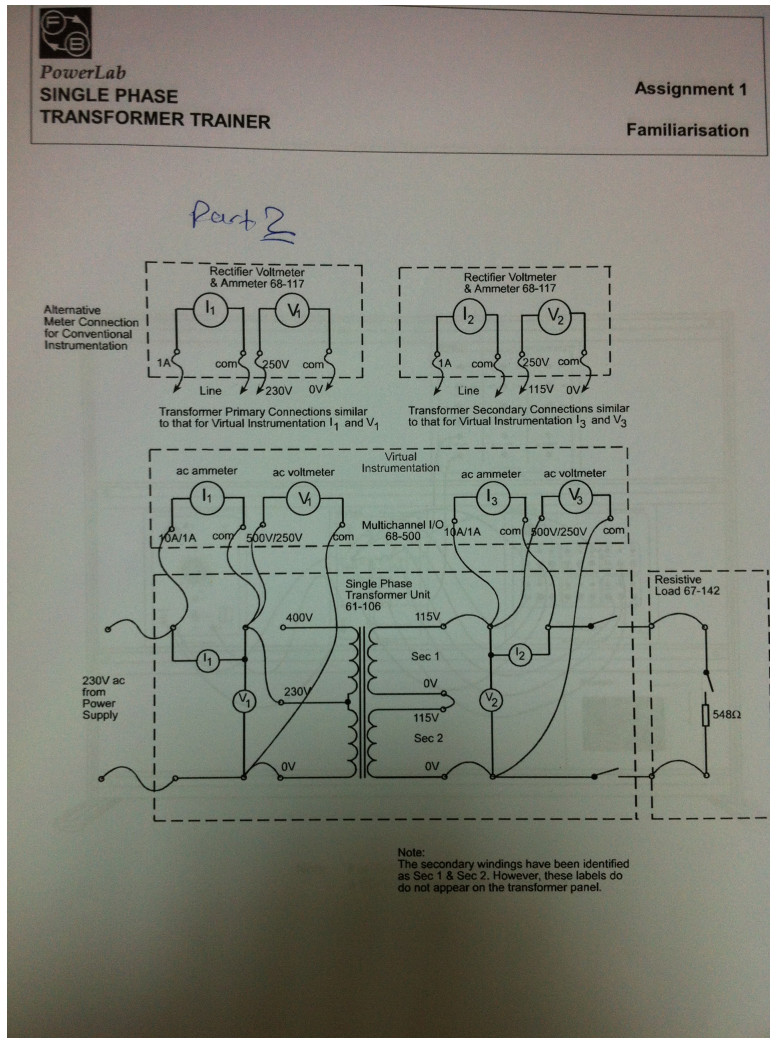
### 2.1 Experiment 1

The experiment was set up according to the circuit diagram below. The load at the output of the transformer was not connected.



## 2.2 Experiment 2

The experiment was set up according to the circuit diagram below. the load at the output of the transformer was connected.



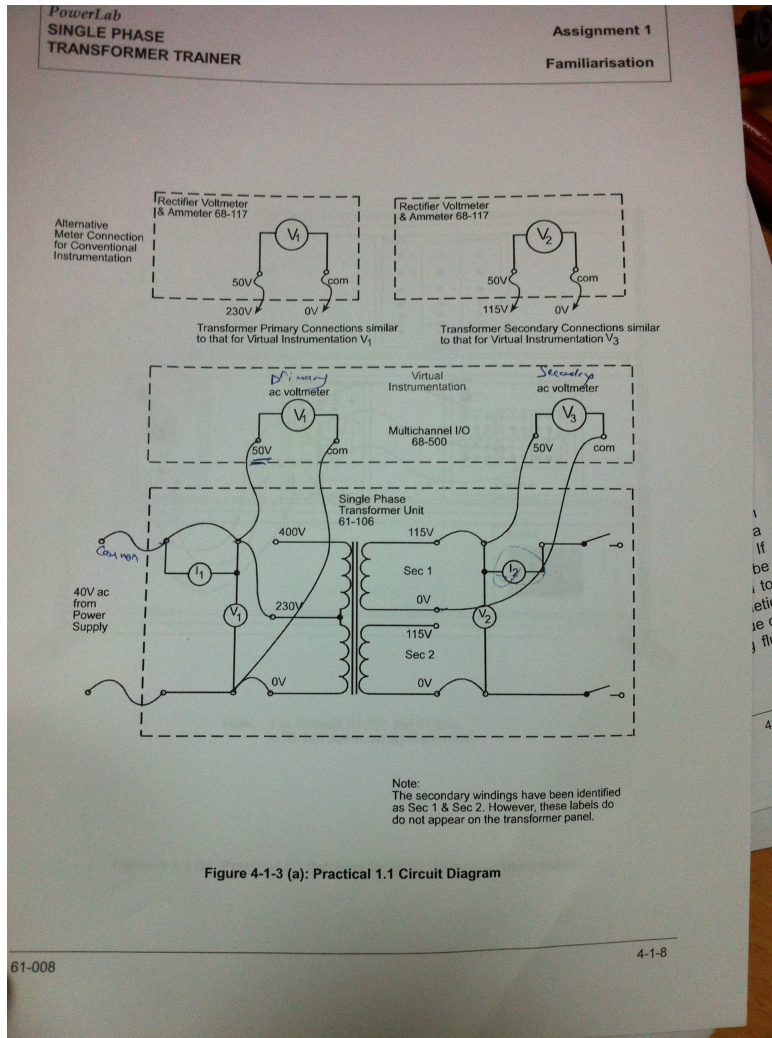
## 3 List of Equipment used

- Transformer Bank.
- Connecting Wires.
- Multi-meter.
- Analogue AC Voltmeter.
- Analogue AC Ammeter.



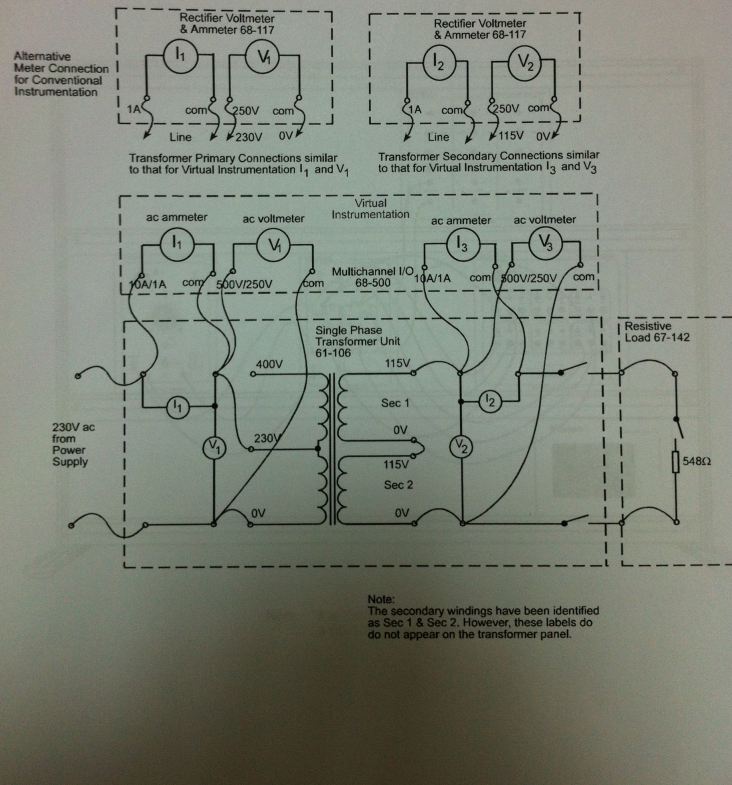
## 4 Procedure

- Connect the circuit as shown in the manual.
- Turn ON or OFF the power supply after the circuit is connected.
- Check and record the values onto the lab manual.





Part 2



## 5 Results and Discussions

At the end of the exercise we got the following results:-

- In a balanced three phase system, a Y connected device carries the whole line current, and  $1/\sqrt{3}$  times the line voltage.
- A Y connected supply and load provides a neutral point.
- In a balanced three phase system, a Delta connected device carries  $1/\sqrt{3}$  times the line current and the whole line voltage. That is, the magnitude of the line current is  $\sqrt{3}$  times the magnitude of the phase current.
- A Delta connected supply and load has no neutral point.



Practical 1.1

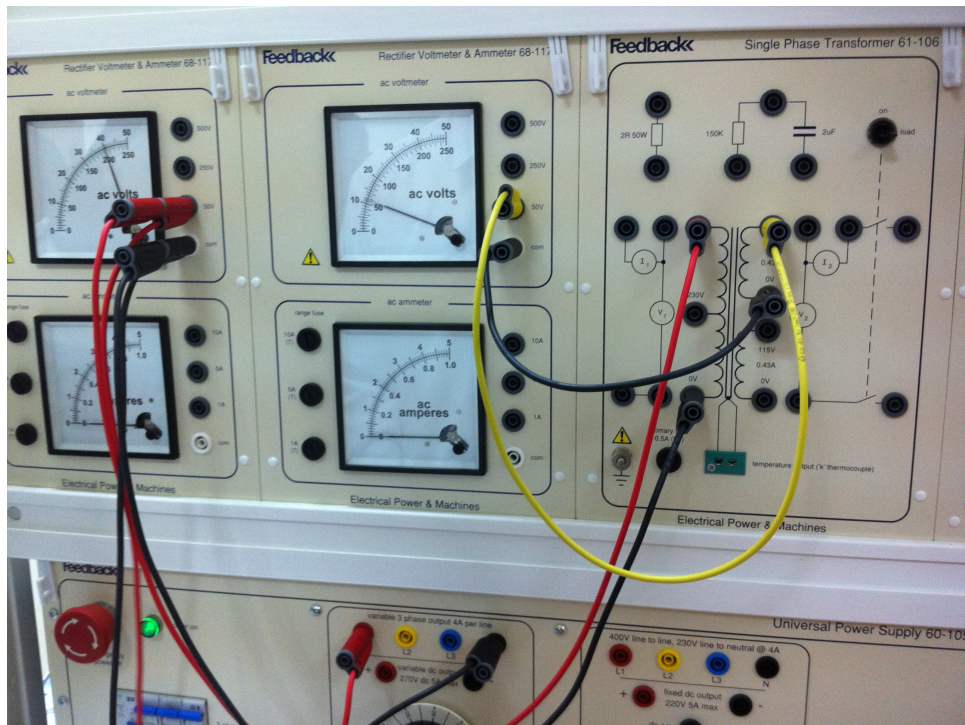
Voltmeter 1		Voltmeter 2		Voltmeter Ratio on No Load (Primary Reading/Secondary Reading)
Primary Connections	Reading	Secondary Connections	Reading	
400V, 0V	40	115V, 0V (Sec 1)	11.5V	
400V, 0V	40	115V, 0V (Sec 2)	11.5V	
400V, 0V	40	115V(Sec 1), 0V (Sec 2) [0V (Sec 1) & 115V (Sec 2) linked]	25V	
230V, 0V	40	115V (Sec 1), 0V (Sec 2) [0V (Sec 1) & 115V (Sec 2) linked]	45V	

step up

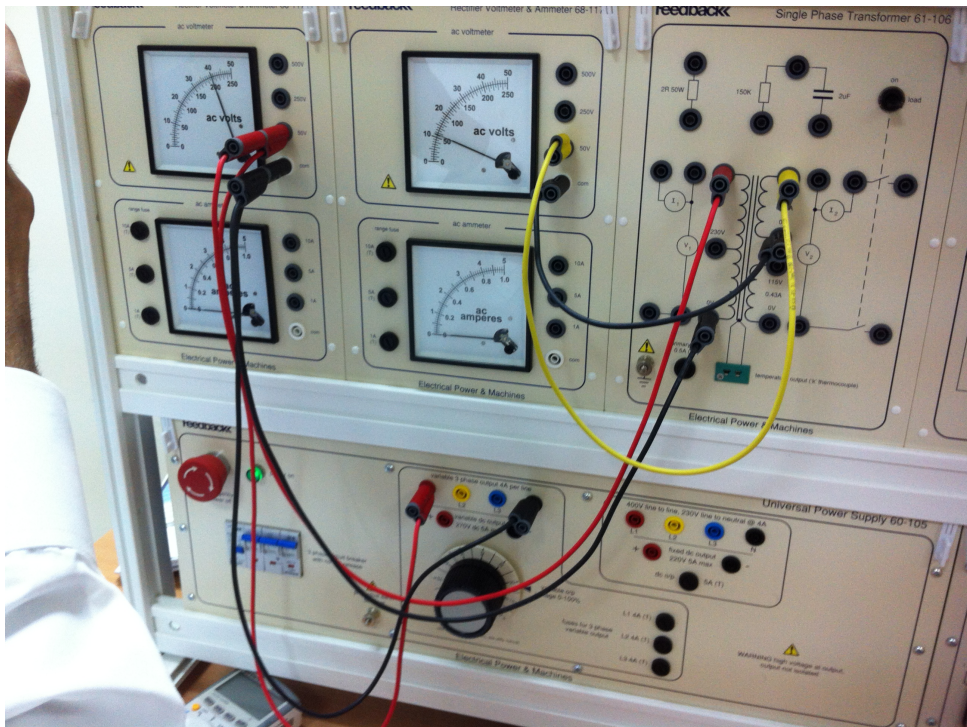
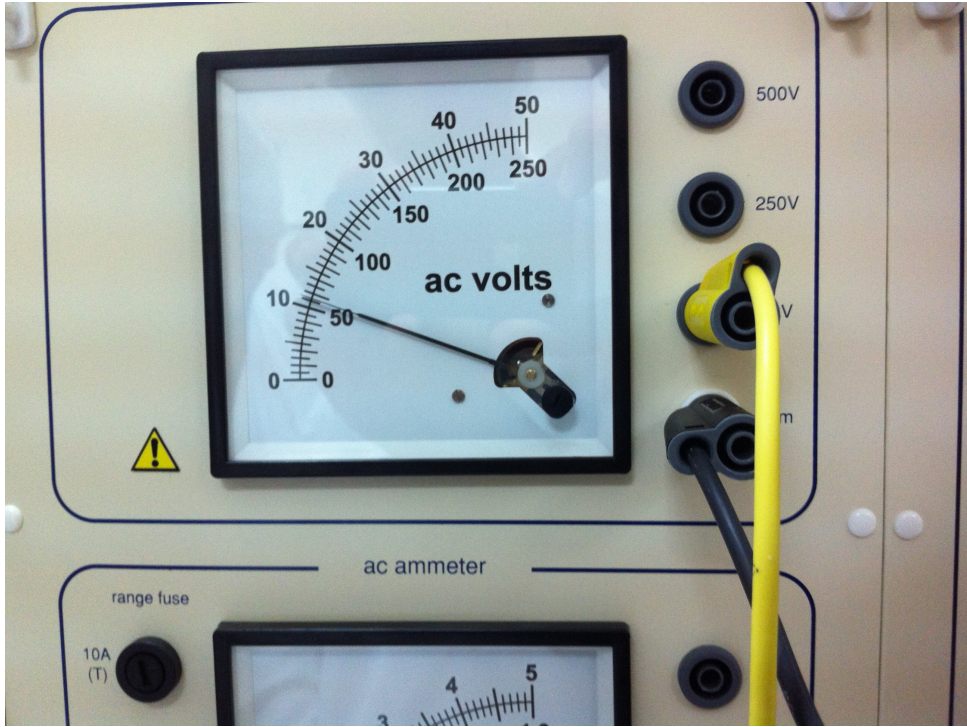
Table 4-1-1

Practical 1.2

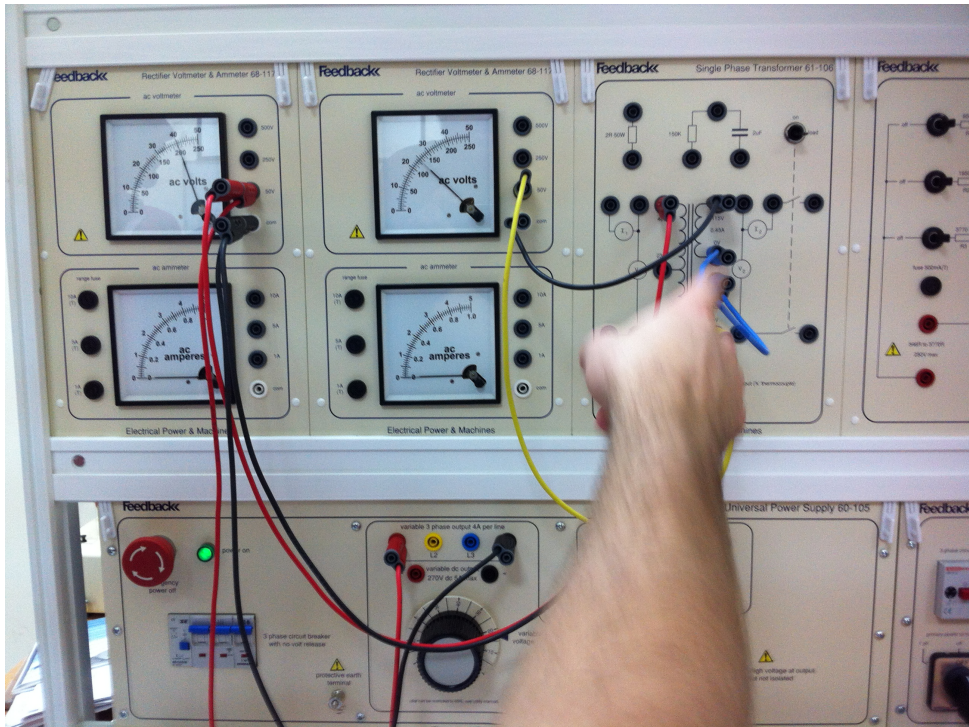
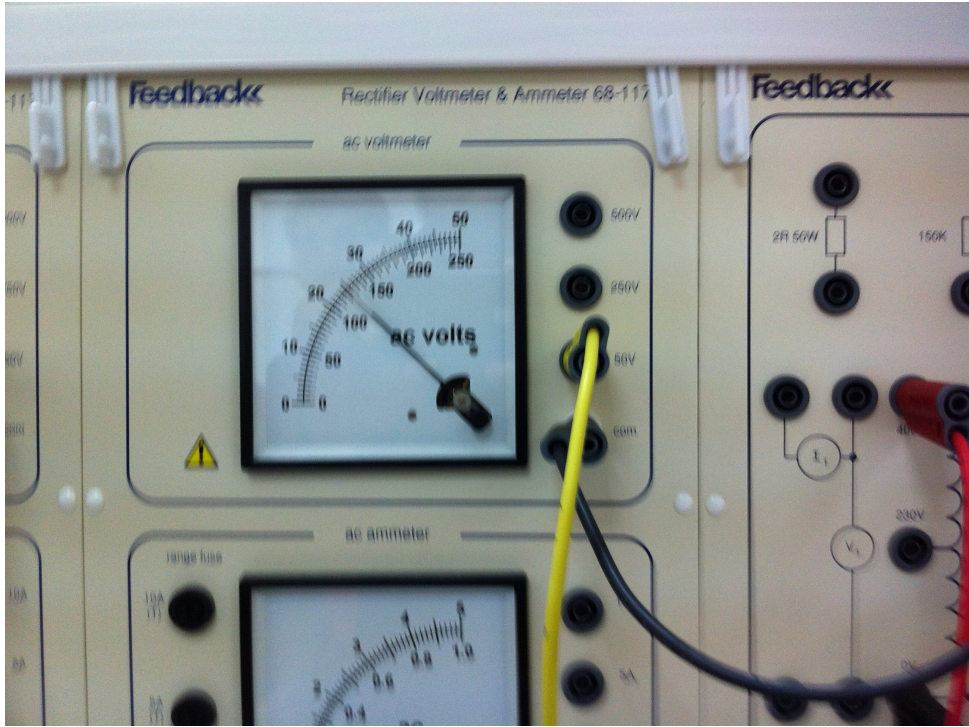
Primary Voltage ( $V_1$ )	Primary Current ( $I_1$ )	Secondary Voltage ( $V_2$ )	Secondary Current ( $I_2$ )	Load Resistance ( $\Omega$ )
230				

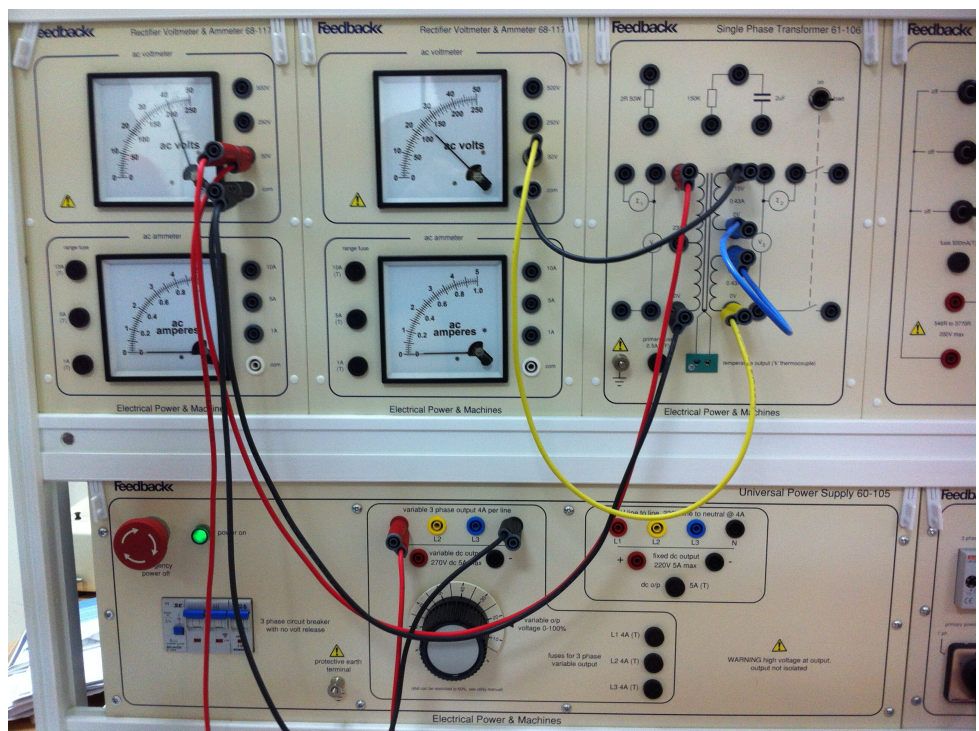












## 6 Conclusion

- Two types of transformer configurations are there. Step-Up and Step-Down Configurations.
- Current is high when load is connected because it is drawing more power from the coil.

## 7 Team Dynamics

Everybody in the group contributed equally in making Lab report, doing the experiment and concluding results analytically.

Report/Member	Weight/Grade	Mirza Mohsin	Ali Raza	Bilal Arshad	Muhammad Obaidullah
Abstract	10%	100%	0%	0%	0%
Introduction	20%	0%	50%	0%	50%
Procedure Part 1	10%	75%	0%	0%	25%
Procedure Part 2	10%	0%	75%	0%	25%
Procedure Part 3	10%	0%	0%	75%	25%
Results Part 1	10%	75%	0%	0%	25%
Results Part 2	10%	0%	75%	0%	25%
Results Part 3	10%	0%	0%	75%	25%
Conclusion	10%	0%	0%	100%	0%
<b>Claimed Contribution</b>		<b>25%</b>	<b>25%</b>	<b>25%</b>	<b>25%</b>
<b>Contribution Validation Penalty</b>		<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>
<b>Overall Contribution</b>		<b>25%</b>	<b>25%</b>	<b>25%</b>	<b>25%</b>
<b>Overall Grade with Quality</b>	<b>100%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>