Course Name:	**Elements of Electrical and Electronics Engineering**	**Semester:**	**I/II**
Date of Performance:		**Batch No:**	**G3**
Faculty Name:	**Milind Marathe**	**Roll No:**	**16010421063**
Faculty Sign & Date:		**Grade/Marks :**	**/ 25**

Experiment No: 9

Title: Measurement of Power using Two Wattmeter Method

Aim and Objective of the Experiment:

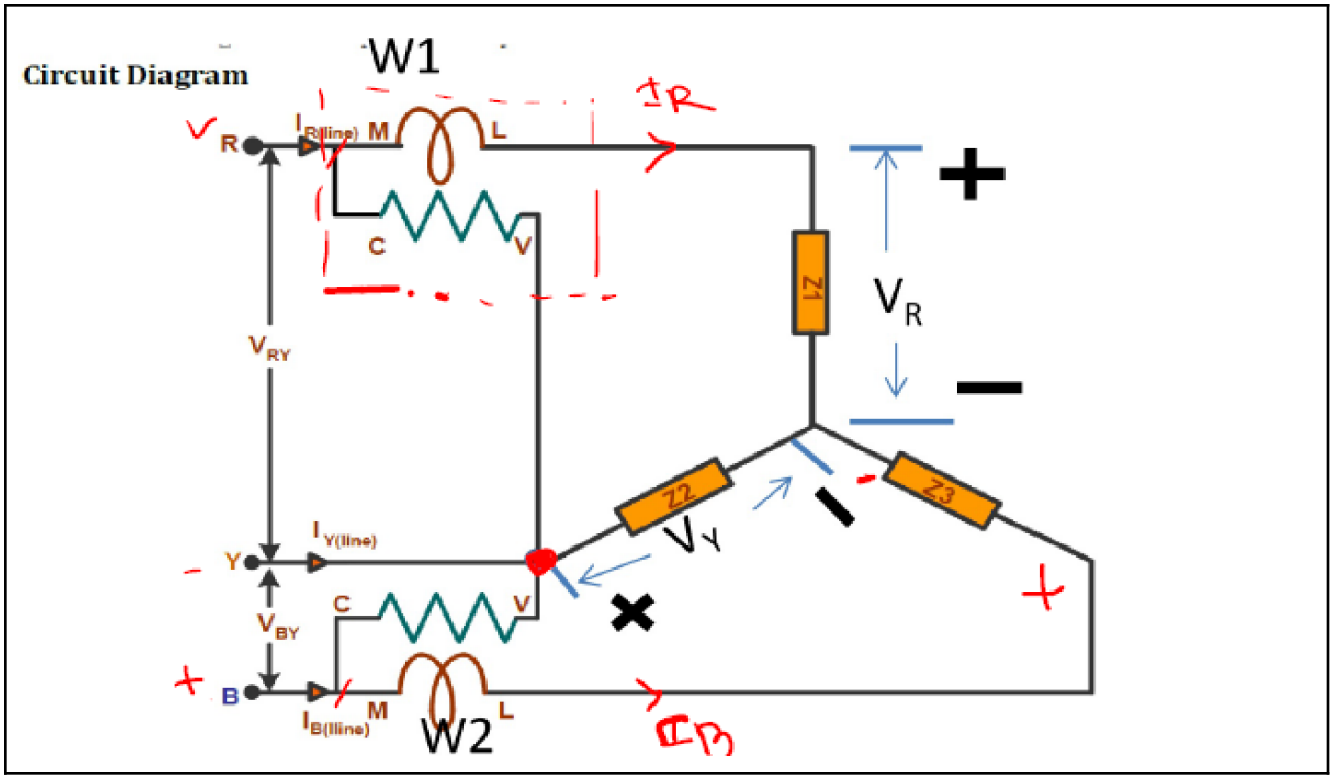
- To measure the power of three phase power using Two Wattmeter Method

COs to be achieved:

CO1: Analyze resistive networks excited by DC sources using various network theorems.

Circuit Diagram/ Block Diagram:

Circuit Diagram



Stepwise-Procedure:

1. Connect the circuit as shown in circuit diagram
2. Increase the load and note down the reading VL,IL,W1 and W2
3. Practically you will obtain total power W=W1+W2
4. Theoretically power is measured by using formula $P=\sqrt{3}V_L I_L \cos\phi$, using $\cos\phi=1$(unity) for resistive load.

Observation Table:

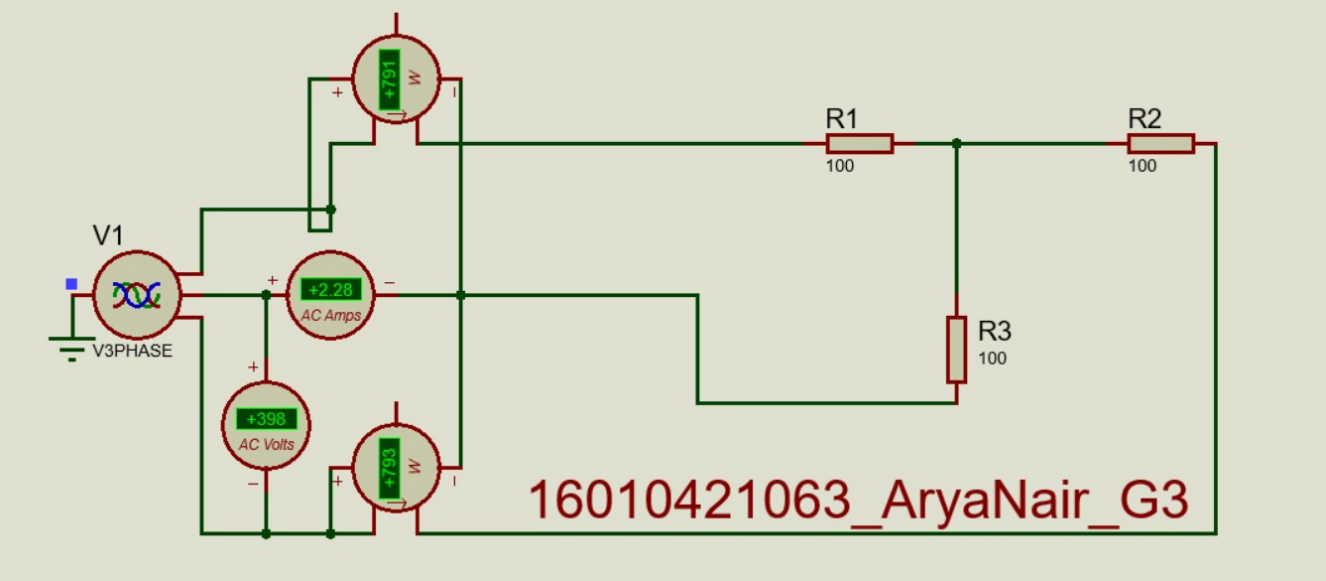
STAR LOAD

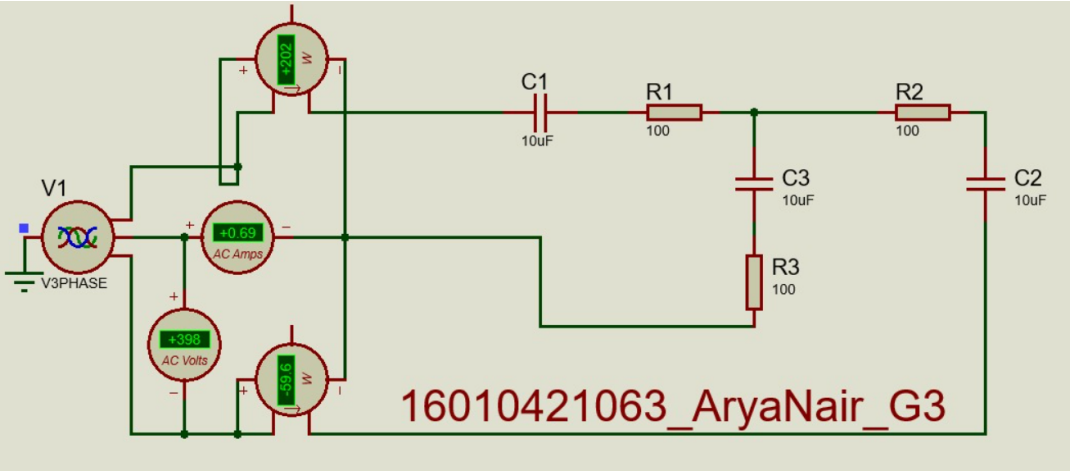
Sr No.	Load	V_L	I_L	W_1	W_2	$W=W_1+W_2$	$\sqrt{3}V_L I_L \cos\phi$
1	R = 100	398 V	2.28 A	791 W	793 W	1584 W	1571.68 W
2	R = 100 L = 1H	398 V	0.70 A	-59.4 W	205 W	145.6 W	146.36 W
3	R = 100 C = 10uF	398 V	0.69 A	201 W	60 W	261 W	260.69 W

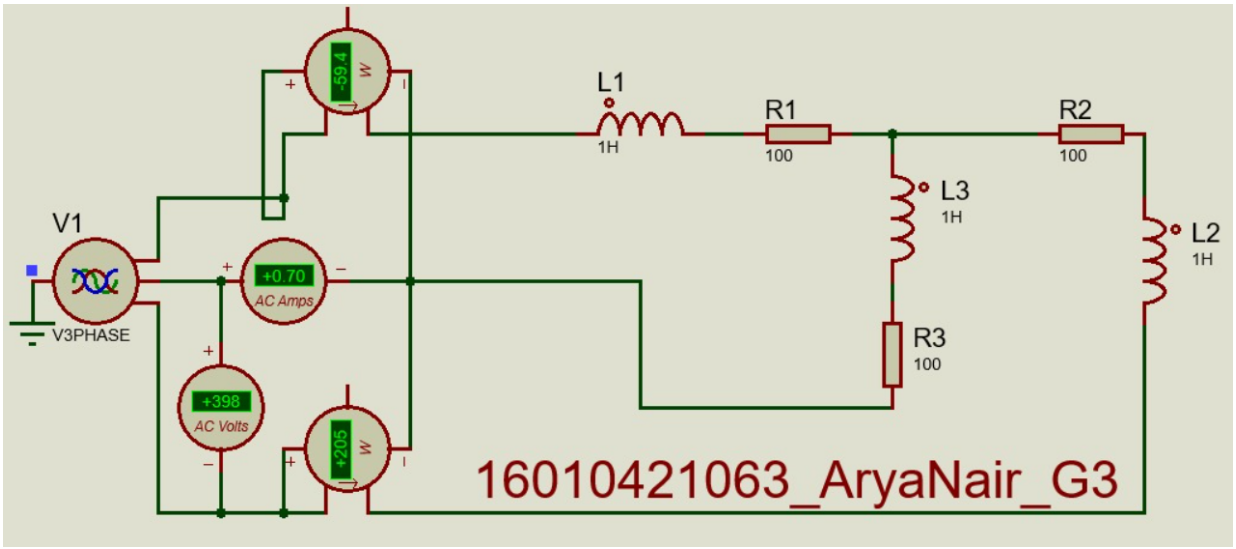
DELTA LOAD

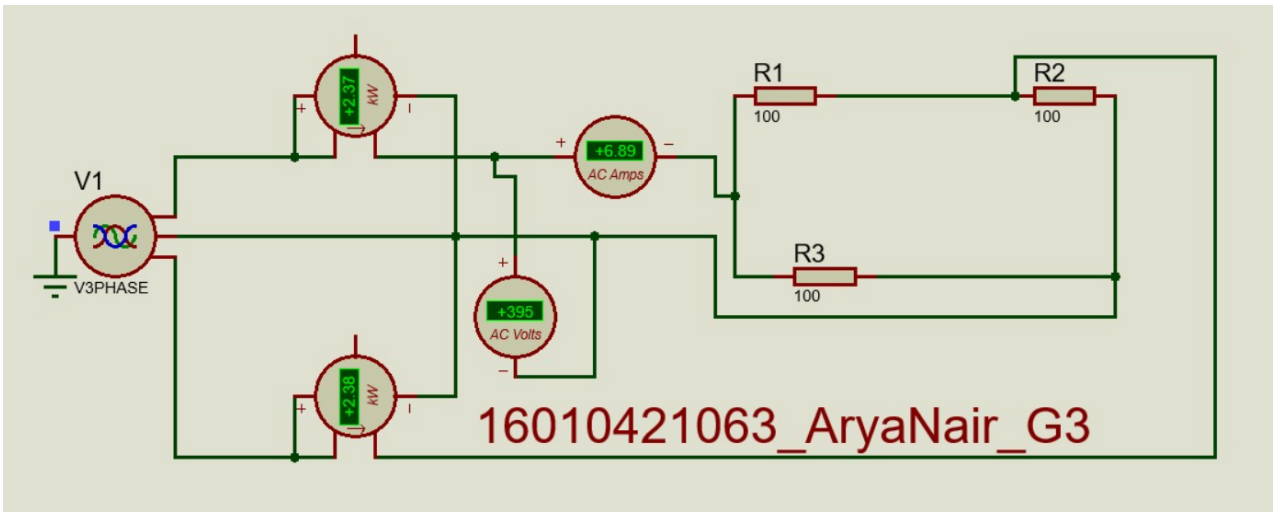
Sr No.	Load	V_L	I_L	W_1	W_2	$W=W_1+W_2$	$\sqrt{3}V_L I_L \cos\phi$
1	R = 100	395 V	6.89 A	2370 W	2380 W	4750 W	4713.72 W
2	R = 100 L = 1H	395 V	2.1 A	-178 W	614 W	436 W	428.36 W
3	R = 100 C = 10uF	395 V	2.06 A	605 W	-179 W	426 W	415.78 W

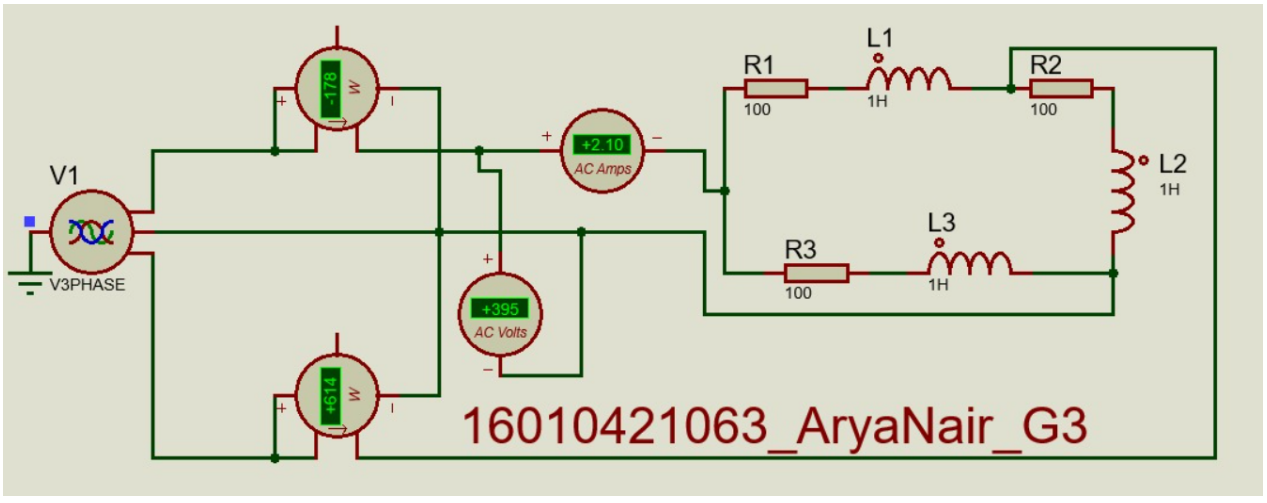
Screenshot of Output:

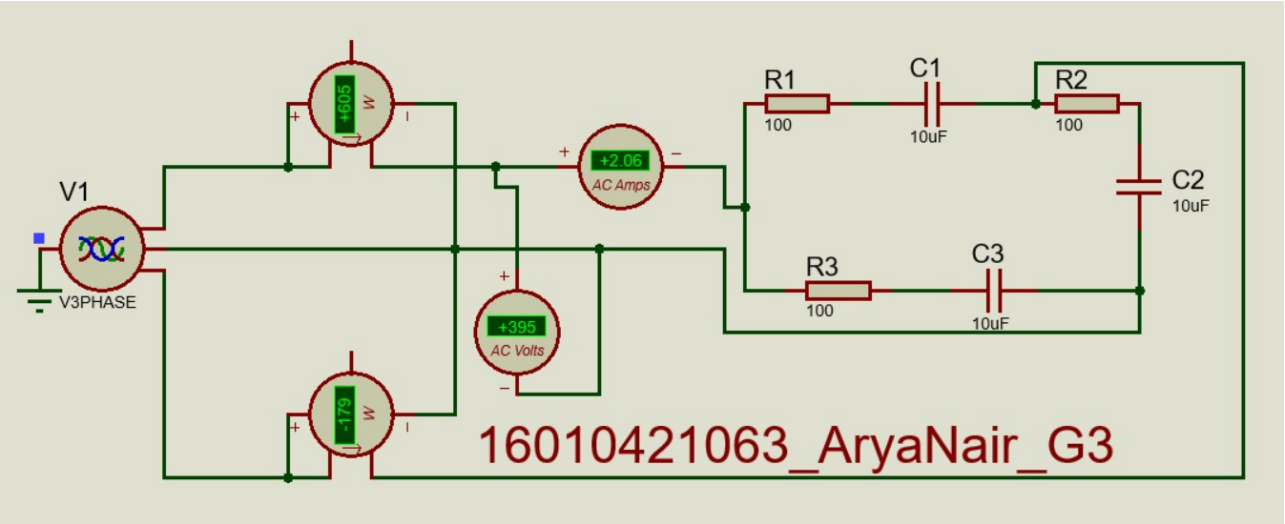





-59.4
W
L1
1H
R1
100
R2
100
L3
1H
L2
1H
V1
V3PHASE
+0.70
AC Amps
R3
100
+398
AC Volts
+205
W
16010421063_AryaNair_G3


+2.37
kW
R1
100
R2
100
+6.89
AC Amps
V1
V3PHASE
R3
100
+395
AC Volts
+2.38
kW
16010421063_AryaNair_G3


-178
W
L1
R1
100
1H
R2
100
+2.10
AC Amps
L2
1H
V1
V3PHASE
L3
R3
100
1H
+395
AC Volts
+614
W
16010421063_AryaNair_G3



Star connected

$W_1 = V_{RR} I_R \cos(30-\phi)$

$W_2 = V_{YB} I_Y \cos(30+\phi)$

$I_R = I_Y = I_L$

$V_{RB} = V_{YB} = V_L$

$W_1 = V_L I_L \cos(30-\phi)$

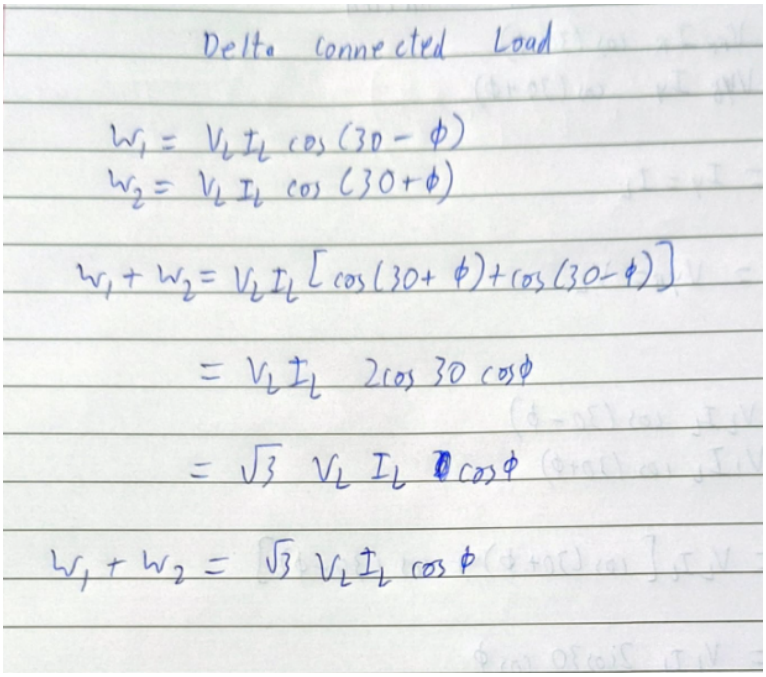
$W_2 = V_L I_L \cos(30+\phi)$

$W_1 + W_2 = V_L I_L [\cos(30+\phi) + \cos(30-\phi)]$

$= V_L I_L \, 2\cos 30 \cos\phi$

$= \sqrt{3} V_L I_L \cos\phi$

$W_1 + W_2 = \sqrt{3} V_L I_L \cos\phi$



Conclusion:

We used to watt meters to successfully determine the power of a three phase system

Signature of faculty in-charge with Date: