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EXPERIMENTAL STUDY AND ANALYSIS OF POWER QUALITY ON HARMONIC MEASUREMENT

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ABSTRACT

In this paper, we are study the measurement of harmonic distortion with the help of experimental approach in which included the various equipment and loads such as Experimental setup, Indicator, A.C. power supply, circuit with transformer, switch for different loads, different loads (Filament bulb, CFL and LED).

1. INTRODUCTION

We are getting the different harmonic distortions using applied load. The electrical power quality is very necessary to improve for increasing the working life of different loads (Filament bulb, CFL and LED). The various types of faults are produced in power supply system using electronic device and other appliances. The electronic loads are mostly used in domestic and industrial appliances, this type load are created harmonic distortions in power supply system. The monitor and its control are very necessary for power system stability.

2. EXPERIMENTAL SETUP

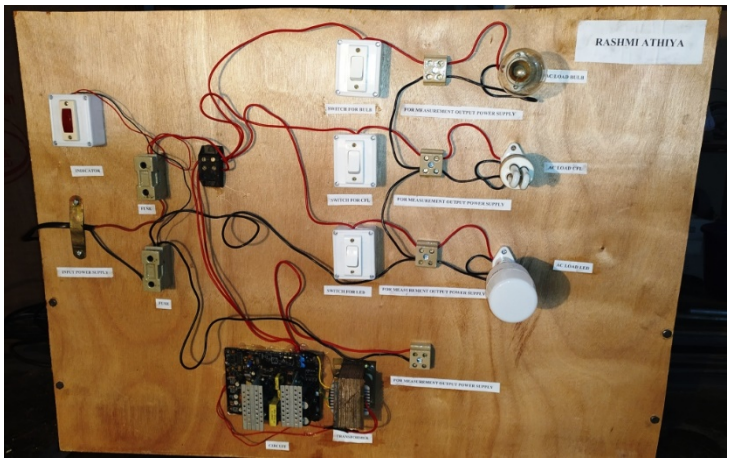

Figure 1: Experimental setup

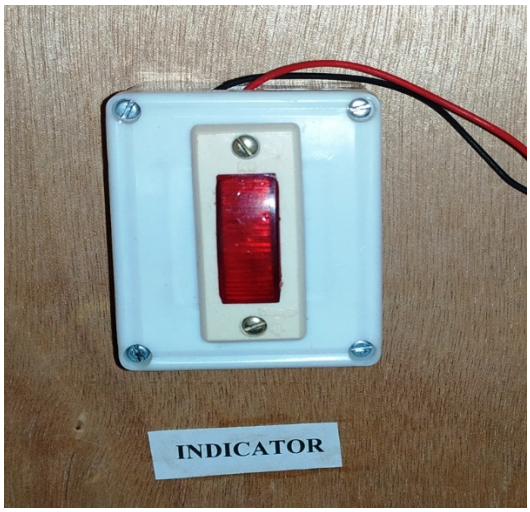

Figure 2: Indicator

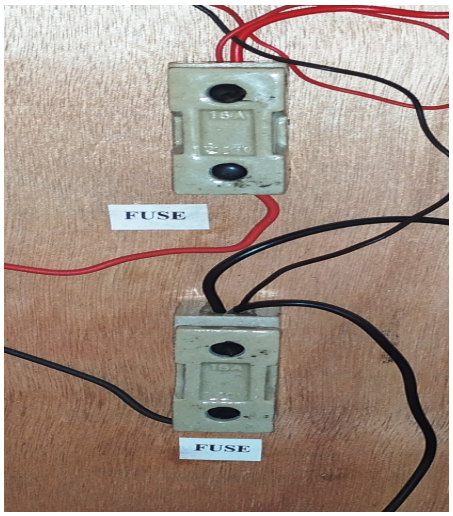

Figure 3: A.C. power supply

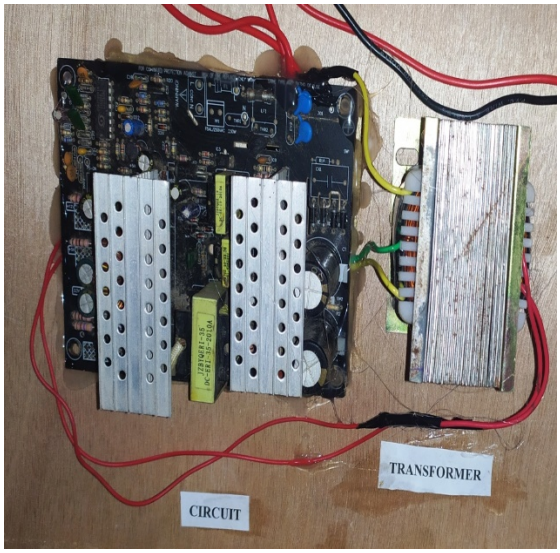

Figure 4: circuit with transformer

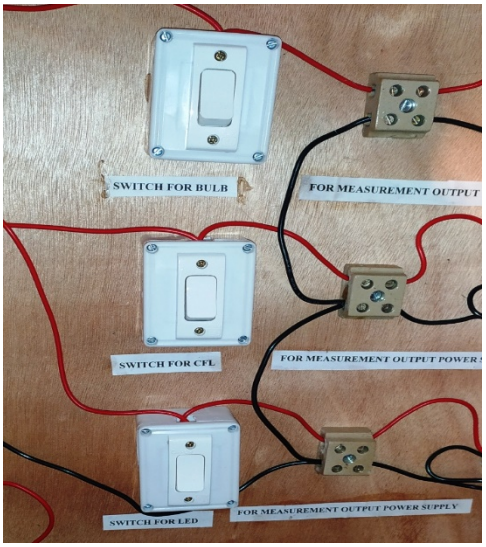

Figure 5: switch for different loads

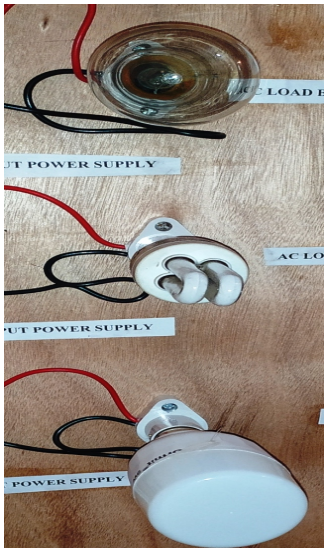

Figure 6: different loads

3. RESULTS AND DISCUSSION

Table 3.1: Reading

Sr. No.	Reading without Filter circuit in Hz	Reading with Filter circuit in Hz
1	50.10 Hz	49.87 Hz

Table 3.2: Reading with Parameter

Sr. No.	Parameter	Reading without Filter circuit	Reading with Filter circuit
1	V_1	234.43 V	232.01 V
2	I_1	59.94ma	63.43ma
3	P_1	11.29 W	12.237 W
4	S_1	14.187 VA	14.894 VA
5	Q_1	8.498Var	8.628 Var
6	$ø_1$	38.11	34.00

Table 3.3: Applied Load with Total harmonic distortions without using Filter circuit

Sr. No.	Applied Load	Total harmonic distortions
1	Filament bulb (100 Watts)	4.56%
2	CFL (15Watts)	8.45%
3	LED (14Watts)	8.89%

Table 3.4: Applied Load with Total harmonic distortions using Filter circuit

Sr. No.	Applied Load	Total harmonic distortions
1	Filament bulb (100 Watts)	1.21%
2	CFL (15Watts)	2.03%
3	LED (14Watts)	2.58%

4. CONCLUSION

We are finding out the total harmonic distortions without using Filter circuit such as 4.56% using Filament bulb (100 Watts), 8.45% using CFL (15Watts), 8.89% using LED (14Watts) and using Filter circuit such as 1.21%using Filament bulb (100 Watts), 2.03%using CFL (15Watts), 2.58%using LED (14Watts).

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None.

CONFLICT OF INTEREST

None.

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None.

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