

UPS Harmonic Test Report

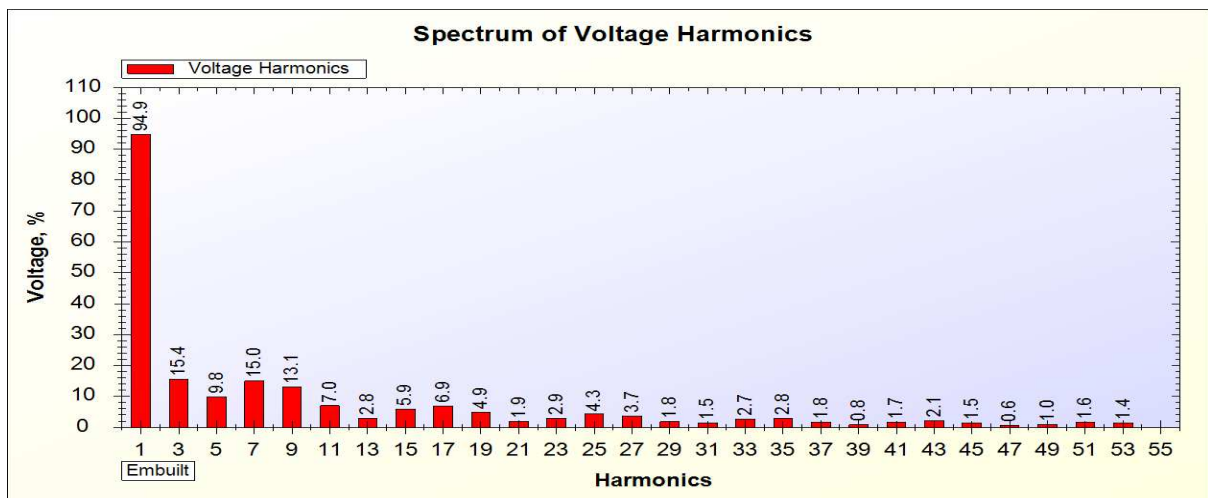
Date : 25-11-2014

Standard	<i>UL1778 article 49 Harmonic Distortion Test</i>
Instrument Under Test	<i>Square Wave UPS</i>
Company Name	<i>Not Disclosed</i>
Rated Voltage and Load	<i>12 Volt, 50A</i>
Battery Type	<i>LeadAcid</i>
Test Condition	<i>On battery source (Assuming full charged battery source)</i>

Load Pattern-

On 20% Load

Load Condition	Voltage	Voltage Harmonics
37.685 VA	219.1 V	33.34%

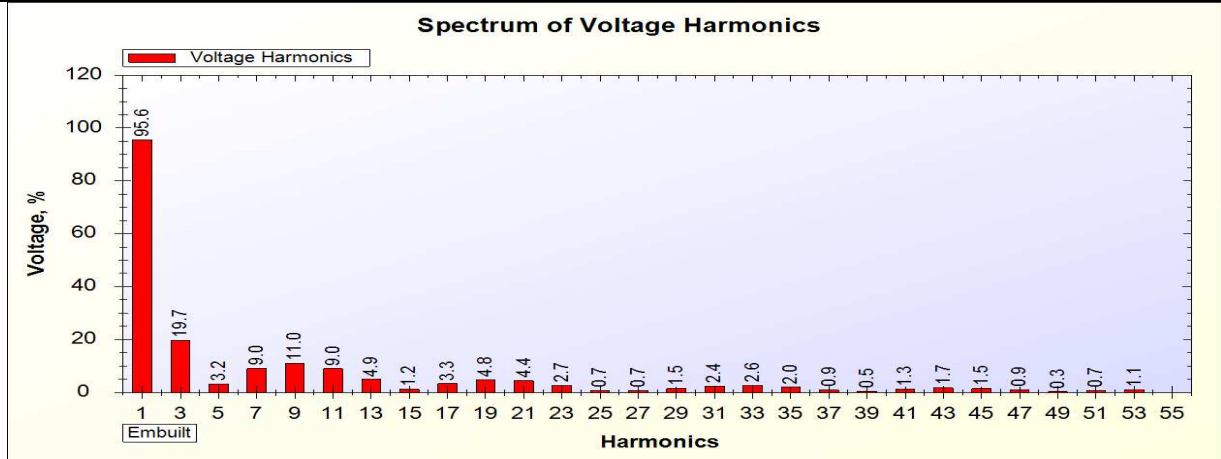


Notes-

1. THD is 33.4% .
2. First Harmonic is 94.9 % of Vrms.
3. Other harmonics are also high.
4. 3rd harmonic is 15.4% of Vrms.
5. 5th harmonic is lower than 3rd .
6. 7th harmonic is also high and 15% of Vrms.
7. 9th harmonic is 13.1% of Vrms.
8. 11th ,15th and 17th harmonics are also greater than 5%.

On 50% Load

Load Condition	Voltage	Voltage Harmonics
91.206 VA	213.1 V	30.67%

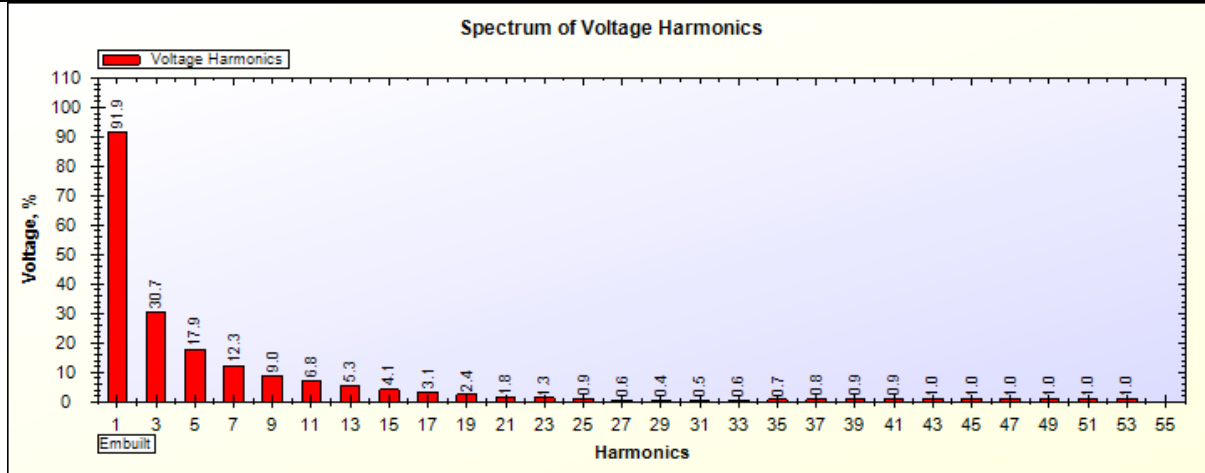


Notes-

1. THD is 30.67 %.
2. First Harmonic is 95.6% of V_{rms} .
3. Voltage is decreased by 6 Volts.
4. 3rd harmonic is increased to 19.7%
5. 5th harmonic is reduced to 3.2%.
6. 7th harmonic is also reduced to 9%.
7. 9th harmonic is reduced to 11%.
8. 11th harmonic is increased to 9.0%.
9. Other harmonics are less than 5%.

On 75% Load

Load Condition	Voltage	Voltage Harmonics
151.98 VA	190.7 V	43.08%



Notes-

1. THD is 43.08%.
2. First Harmonic is 91.9 %.
3. Voltage is decreased by 23 Volts.
4. 3rd harmonic is increased to 30.7%.
5. 5th harmonic is increased to 17.9%.
6. 7th harmonic is increased to 12.3%.
7. 9th harmonic is reduced to 9%.
8. 11th harmonic is reduced to 6.8 %.
9. 13th harmonic is increased to 5.3%.
10. Other harmonics are less than 5%.
11. Harmonics from 25 to 55 are less than 1%.

Summary –

1. Expected
2. On low battery THD increases.
3. THD % of square wave inverter is very high.
4. As load increases first harmonic decreases.
5. 3rd to 15th harmonics are affected most.
6. Other harmonics are less than 2%.

Testing Instrument – THDPM-1

Test Done By –

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(Electronics Testing)