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Oct 17th, 2017

Project: 4788115625

Global Compliance Co., Ltd.

10F.-2, No.9, Jingguo Rd., Taoyuan City, Taoyuan County 33050, Taiwan (R.O.C.)

Attention : Ms. Cindy Huang

Subject : Power Quality Study by UL Test Laboratories

Dear Ms. Huang :
On Oct 17th, UL completed a Power Quality Study on specific test circuits at your facility.
Mr. Jeff BH. Chen of UL completed the power quality assessment. The circuits assessed provide power during testing of your products under the UL Data Acceptance Program (DAP). The lab area and circuits at your facility that were included in Power Quality Study are summarized below.

Lab Area	Power Source	Total Circuits	Circuits Tested (Loaded)
WTDP Lab	AC POWER CORP Model NO : APS-11010GI 15 kVA	1	10F Lab Load Test Area
WTDP Lab	AC POWER CORP Model NO : APS-11010BD 10 kVA	1	10F Lab Load Test Area

Load test used two ac sources listed as above. Two circuits was tested for no load and rated load-testing sequence completed. 120 V 1 phase circuit was limited to 20 ampere; 240 V 1 phase circuit was limited to 20 ampere.

The Power Quality Study consisted of the two following tests:

1. Electrical Regulation / Circuit Capacity Tests: Performed on circuits located the greatest electrical distance from the supply source. These tests verify the regulation of the voltage and frequency, and value of the total harmonic distortion under both a one-hour unloaded condition and a one-hour fully loaded condition. In general , under both loaded and unloaded condition , the voltage measured is not to deviate from the nominal voltage value by more than ± 3 % ; the frequency is not to deviate by more than ± 2 %; and the total harmonic distortion is not exceed 5 % of the fundamental.

The Power Quality Study test results are provided in the attached datasheets. Also attached for reference is the power system distribution drawing that you provided. This drawing detail the lab power circuits involved in the Power Quality Study and are valuable for future reference.

In Summary, this report represents the power quality as assessed at the time of the testing was completed. Power quality is a criterion to be considered at and time test data is being obtained and should be monitored on a regular basis. With the issuing of this letter report, we are closing this project and notifying our accounting department to invoice you for and outstanding charges. If you should have any questions or if we can be of service for future projects please do not hesitate to call anytime.

Sincerely,

Jeff BH Chen
Laboratory Assistant
Commercial & Imdustrial
TEL: 886-2-2896-7790 EXT: 62368
Email: Jeff.BH.Chen@ul.com

Reviewed by:
Phil Pan
Engineering Technician
Commercial & Imdustrial

Attachments:

(1) Power Quality Analysis Data Sheets
(2) Site Drawings

(1) Power Quality Analysis Data Sheets

TEST LOCATION:	
[X]WTDP **[ ]**CTDP **[ ]**TCP **[ ]**TPTDP	
Company Name	Global Compliance Co., Ltd.
Address	10F.-2, No.9, Jingguo Rd., Taoyuan City, Taoyuan County 33050, Taiwan (R.O.C.)
Project No	4788115625

CLIENT INFORMATION	
Company Name	Global Compliance Co., Ltd.
Address	10F.-2, No.9, Jingguo Rd., Taoyuan City, Taoyuan County 33050, Taiwan (R.O.C.)

AUDIT INFORMATION:		
[X] Description of Tests	Number of Circuits Tested: 2	
[X] Tests Conducted by	Jeff BH Chen	2017-10-17
	Printed name	Signature & Date

Test Equipment Information

Equipment ID	Equipment Name	Traceability Lab	Report No.	Calibration Date	Calibration Due
PA057	Power Analyzer	UL (TAF：1990)	IHT-17-PA057-01 IH-17-PA057-01	2017-05-02	2018-05-31

Verification of Circuits

METHOD

The following items need to be conducted at the client's laboratory prior to starting the Power Quality Analysis.

[X] Review Schematic of test laboratory and verify the number of power sources.

[X] Verify each power source back to the disconnect (breaker). Use a voltage meter to ensure there is no voltage present once the circuit is broken. (or any other means to ensure the correct circuit is being evaluated)

[X] Verify "ALL LOADS" (Cycling Equipment, if any) are documented for each power source used for testing.

Note: Cycling Equipment is considered to be any type of equipment that is placed on the same power source as that of the test source, which could potentially effect the measurements of the Power Quality Analysis. Examples of cycling equipment are as follows, but not limited to: HVAC Equipment, Manufacture's Machinery, Welding Equipment, and other test equipment.

Results

Number of Test Circuits = 2

Identify the Loads per each circuit

CIRCUIT IDENTIFICATION	LOAD TYPES
AC POWER CORP Model NO : APS-11010BD 10 kVA	Resistive Load / 120 V 20 A
AC POWER CORP Model NO : APS-11010GI 15 kVA	Resistive Load / 240 V 20 A

Voltage Regulation / Circuit Capacity Test

METHOD A

1. The open circuit voltage at the representative test bench receptacle / test power connection point is to be adjusted to the nominal value and recorded. ***No further adjustments are to be made.***

METHOD B

2. A load is connected to the same outlet / test power connection point.

    a. The voltage is to be adjusted to the appropriate nominal value and the load adjusted to draw the rated amperage of the supply and the load adjusted to draw the rated amperage of the supply at the nominal voltage.

    b. The voltage at the test connection is then measured. The loaded circuit is then to be monitored and recorded throughout a one-hour period.

    c. Where a manual variac / slidac is used, the value of the voltage adjustment made at each recommended 15 minute interval mark, is to be recorded. Min/Max values are recorded at each recommended interval PRIOR to voltage adjustment

Results

(1) Circuit Tested: AC Source: AC POWER CORP / Model NO : APS-11010BD 10 kVA @ Table 1 3-2 120Vac receptacle

Method	A (No Load)	B (Full Load)
Date of Measurement	2017-10-17	2017-10-17
Nominal Voltage (V)	120	120
Loading Current (A)	N/A	20
Minimum Voltage in the entire period (V)	120.38	117.06
Maximum Voltage in the entire period (V)	123.05	118.11
Maximum Voltage variation (%)	2.54	2.45

(2) Circuit Tested: AC Source: AC POWER CORP / Model NO : APS-11010GI 15 kVA @ Table 1 3-2 240Vac receptacle

Method	A (No Load)	B (Full Load)
Date of Measurement	2017-10-17	2017-10-17
Nominal Voltage (V)	240	240
Loading Current (A)	N/A	20
Minimum Voltage in the entire period (V)	240.32	234.38
Maximum Voltage in the entire period (V)	244.92	241.65
Maximum Voltage variation (%)	2.05	2.34

Note 1: Voltage variation = $[\text{Max}(V_{max} - V_{nominal}\ ;\ V_{nominal} - V_{min})/V_{nominal}\ ]*100\%$

Reviewed by : _Phil Pan__ Date : _2017-10-19__

Frequency Stability Test

METHOD

NOTE - In most cases, power grids in industrialized countries provide acceptable frequency stability. If it is determined that your domestic power source does maintain a stable frequency, at the value in which the testing occurs, Please provide in the comments below how you determined this acceptable frequency stability.

1. The frequency of the voltage (sinusoid) at the representative test bench receptacle / power connection point is to be measured under no load conditions and recorded.

2. A load is to be connected and adjusted to draw the rated supply amperage. The voltage is to be adjusted to the appropriate nominal value and the load adjusted to draw the rated amperage of the supply at the nominal voltage. Where a variac / slidac is used for voltage regulation, monitoring and adjustment as defined above is permitted until the load and variac heating have stabilized. The frequency of power source is to be measured and recorded (e.g. with a frequency counter or an oscilloscope). The circuit is to be loaded for one hour and the frequency under this loading condition is then to be measured again and recorded.

Results

Circuit Tested: AC POWER CORP / Model NO : APS-11010BD 10 kVA @ Table 1 3-2 120Vac receptacle

Method	A (No Load)	B (Full Load)
Date of Measurement	2017-10-17	2017-10-17
Nominal Frequency (Hz)	60 @ 120 V	60 @ 120 V
Loading Current (A)	N/A	20
Minimum Frequency in the entire period (Hz)	59.93	59.89
Maximum Frequency in the entire period (Hz)	60.09	60.09
Maximum Frequency variation (%)	0.16	0.18

Circuit Tested: AC Source: AC POWER CORP / Model NO : APS-11010GI 15 kVA @ Table 1 3-2 240Vac receptacle

Method	A (No Load)	B (Full Load)
Date of Measurement	2017-10-17	2017-10-17
Nominal Frequency (Hz)	60 @ 240 V	60 @ 240 V
Loading Current (A)	N/A	20
Minimum Frequency in the entire period (Hz)	59.91	59.95
Maximum Frequency in the entire period (Hz)	60.16	60.11
Maximum Frequency variation (%)	0.27	0.18

Note 1: Frequency variation = $[\mathrm{Max}(F_{max} - F_{nominal}\ ;\ F_{nominal} - F_{min})/F_{nominal}\ ]*100\%$

Reviewed by : _Phil Pan_ Date : _2017-10-19_

Total Harmonic Distortion Test

METHOD

1. Using a Total Harmonic Distortion analyzer, the harmonic distortion of the voltage at the representative test bench receptacle / power connection point is to be measured under open circuit conditions.

2. The total harmonic distortion is measured with the test connection point loaded to the rated amperage. The circuit with this load was allowed to operate for one hour and the harmonic distortion under this loading condition was measured again.

Results

Circuit Tested: AC POWER CORP / Model NO : APS-11010BD 10 kVA @ Table 1 3-2 120Vac receptacle

Method	A (No Load)	B (Full Load)
Date of Measurement	2017-10-17	2017-10-17
Nominal Frequency (Hz)	60 @ 120 V	60 @ 120 V
Loading Current (A)	N/A	20
Maximum THD in the entire period (%)	1.63	1.59

Circuit Tested: AC Source: AC POWER CORP / Model NO : APS-11010GI 15 kVA @ Table 1 3-2 240Vac receptacle

Method	A (No Load)	B (Full Load)
Date of Measurement	2017-10-17	2017-10-17
Nominal Frequency (Hz)	60 @ 240 V	60 @ 240 V
Loading Current (A)	N/A	20
Maximum THD in the entire period (%)	1.32	1.51

Note: THD values greater than 5.0% may be judged acceptable if agreed to by all parties involved, the rationale is documented and requirements of the test standard are maintained.

Reviewed by : _Phil Pan_ Date : _2017-10-19_

(2) Site Drawings

1. Power Wiring Diagram