Prüfbericht-Nr.: *Test report no.*:	**CN24Y0QT 001**	**Auftrags-Nr.:** *Order no.*:	168474698	Seite 1 von 17 *Page 1 of 17*
Kunden-Referenz-Nr.: *Client reference no.*:	N/A	**Auftragsdatum:** *Order date:*	2024-03-19	
Auftraggeber: *Client*:	Xiamen Ampace Technology Limited No.600 Hongtang Road, Tongxiang High-tech Zone, Torch High-tech District, Xiamen City, Fujian 361106, China			
Prüfgegenstand: *Test item*:	Portable Power Station			
Bezeichnung / Typ-Nr.: *Identification / Type no.*:	Andes 1500 X (X = A to Z or blank, difference on the model name and appearance colors only for marketing purpose, no technical difference)			
Auftrags-Inhalt: *Order content*:	Test Report			
Prüfgrundlage: *Test specification*:	CFR47 FCC Part 15: Subpart C Section 15.247 RSS-247 Issue 3 August 2023 RSS-Gen Issue 5 February 2021			

Wareneingangsdatum: *Date of sample receipt*:	2024-05-29	Please refer to Photo Document
Prüfmuster-Nr.: *Test sample no:*	A003723392-005~006	
Prüfzeitraum: *Testing period*:	2024-06-14 - 2024-07-11	
Ort der Prüfung: *Place of testing*:	Refer to Section 2.1	
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.	
Prüfergebnis*: *Test result**:	Pass	

geprüft von: tested by:	X Lin	**genehmigt von:** *authorized by*:	X Bell Hu
Datum: *Date:* 2024-07-18		**Ausstellungsdatum:** *Issue date:* 2024-07-18	
Stellung / Position:	Sachverständige(r)/Expert	**Stellung** / Position:	Sachverständige(r)/Expert

Sonstiges / *Other*: FCC ID: 2BB9O-ANDES1500
IC: 32540-ANDES1500, HVIN: Andes 1500

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
* *Legend:*	*P(ass) = passed a.m. test specification(s)*	*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Prüfbericht-Nr.: CN24Y0QT 001
Test report no.:

Anmerkungen
Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. *The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system.* *Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.*
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3	Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt. *Test clauses with remark of * are subcontracted to qualified subcontractors and descripted under the respective test clause in the report.* *Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.*
4	Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnisen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezueglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019. *The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.*

Test Summary

5.1.1 ANTENNA REQUIREMENT
RESULT: Pass

5.1.2 RADIATED SPURIOUS EMISSION
RESULT: Pass

5.1.3 CONDUCTED EMISSION ON AC MAINS
RESULT: Pass

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1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Test Results.

Appendix B: Photographs of Test Set-up.

2 Test Sites

2.1 Test Facilities

1. TÜV Rheinland (Shenzhen) Co., Ltd.
No.362, Huanguan Middle Road, Songyuansha Community, Guanhu Subdistrict, Longhua District, Shenzhen 518110, Guangdong, China

A2LA Certificate Number: 5162.01

FCC Accreditation Designation No.: CN1260

ISED wireless device testing laboratory: 25069

2. EST Technology Co., Ltd.

Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China

A2LA Certificate Number: 4366.01

FCC Accreditation Designation No.: CN1215

ISED wireless device testing laboratory: 9405A

Note: TÜV Rheinland (Shenzhen) Co., Ltd. Subcontracts test item Conducted Emission to EST Technology Co., Ltd. The tests at the test sites have been conducted under the supervision of a TÜV engineer.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

TÜV Rheinland (Shenzhen) Co., Ltd.

Unwanted Emission Testing (TS9975)					
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Cal. Date**	**Cal. until**
EMI Test Receiver	R&S	ESR 7	102021	2023-07-26	2024-07-25
Signal Analyzer	R&S	FSV 40	101439	2023-07-26	2024-07-25
System Controller Interface	R&S	SCI-100	S10010038	N/A	N/A
Filterbank	R&S	Wlan	100759	2023-07-26	2024-07-25
OSP	R&S	OSP 120	102040	N/A	N/A
Pre-amplifier	R&S	SCU08F1	08320031	2023-07-26	2024-07-25
Amplifier	R&S	SCU-18F	180070	2023-07-26	2024-07-25
Amplifier	R&S	SCU40A	100475	2023-07-26	2024-07-25
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	2022-08-07	2024-08-06
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	2022-08-07	2024-08-06
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	2022-08-28	2024-08-27
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	2022-08-07	2024-08-06
Test software	R&S	EMC32 (V10.60.10)	N/A	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NV9P2	N/A	N/A

3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	2024-06-21	2025-06-20

EST Technology Co., Ltd.

Conducted Emission					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESCI3	EST-E035	Jun. 11, 2024	Jun. 10, 2025
Artificial Mains Network	Rohde & Schwarz	ENV216	EST-E002	Jun. 11, 2024	Jun. 10, 2025
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	EST-E003	Jun. 11, 2024	Jun. 10, 2025
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basics using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table.

Table 2: Measurement Uncertainty

Parameter	**Uncertainty (k=2)**
RF output power, conducted	± 0.99 dB
All emissions, radiated	± 4.17 dB
Conducted Emission	± 3.44 dB

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A & B of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) Co., Ltd. file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The EST Technology Co., Ltd. Test facility located at Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at No.362, Huanguan Middle Road, Songyuansha Community, Guanhu Subdistrict, Longhua District, Shenzhen 518110, Guangdong, China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The product is Portable Power Station which supports 2.4GHz Band Wi-Fi and Bluetooth dual mode wireless functions.

Note: This product contains transmitter module, FCC ID: 2AC7Z-ESP32WROVER; IC: 21098-ESP32WROVER with additional type of antenna, since these changed, Radiated Spurious Emissions (RF output power spot check before RSE testing), Conducted Emissions and EMF are arranged re-testing, and the other conducted measurement test data can be referred to test report RKS170517002-00A, RKS170517002-00B, RSHD200715001-08A and RSHD200715001-08B issued by Bay Area Compliance Laboratories Corp. (Kunshan).

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 3: Technical Specification of EUT

General Information of EUT	**Value**
Kind of Equipment	Portable Power Station
Type Designation	Andes 1500 X (X = A to Z or blank, difference on the model name and appearance colors only for marketing purpose, no technical difference)
FCC ID	2BB9O-ANDES1500
IC	32540-ANDES1500
HVIN	Andes 1500
Input	AC 120V, 60Hz (1800W) or DC 11-60V, 12A (600W)
Output	Output1: AC (*4) 120V 60Hz (2400W); AC (*4) 120V 60Hz (1800W, Bypass mode) Output2: Car Charger (*1)+DC 5521(*2)12.6V/9.5A(120W) Output3:USB-A (*4): 5V/3A 9V/2A 12V/1.5A (18W); USB-C (*2): 5V/3A 9V/3A 12V/3A 15V/3A 20V/5A (100W)
Battery Capacity	1462Wh (32.65Ah, 44.8V)
Technical Specification of Bluetooth dual mode	
Operating Frequency	2402 - 2480 MHz
Type of Modulation	GFSK, π/4-DQPSK, 8DPSK
Channel Number	BR & EDR mode:79 channels, Low Energy mode:40 channels
Channel Separation	BR & EDR mode:1 MHz, Low Energy mode:2 MHz
Data Rate	BR & EDR mode: 1Mbps, 2Mbps, 3Mbps Low Energy mode: 1Mbps
Antenna Type	Metal Antenna
Antenna Gain	Max. 4.26 dBi (Provided by the Client)
Technical Specification of 2.4GHz Wi-Fi	
Operating Frequency	2412 - 2462 MHz for 802.11b/g/n(HT20) 2422 - 2452 MHz for 802.11n(HT40)

Type of Modulation	DSSS(DBPSK/DQPSK/CCK) OFDM(BPSK/QPSK/16QAM/64QAM)
Data Rate	1/2/5.5/11 Mbps for 802.11b 6/9/12/18/24/36/48/54 Mbps for 802.11g MCS0 ~ MCS7 for 802.11n
Channel Number	11 channels for 802.11b/g/n(HT20) 7 channels for 802.11n(HT40)
Channel Separation	5 MHz
Antenna Type	Metal Antenna
Antenna Gain	Max. 4.26 dBi (Provided by the Client)

Table 4: RF Channel and Frequency of Bluetooth BR & EDR

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
0	**2402.00**	20	2422.00	40	2442.00	60	2462.00
1	2403.00	21	2423.00	41	2443.00	61	2463.00
2	2404.00	22	2424.00	42	2444.00	62	2464.00
3	2405.00	23	2425.00	43	2445.00	63	2465.00
4	2406.00	24	2426.00	44	2446.00	64	2466.00
5	2407.00	25	2427.00	45	2447.00	65	2467.00
6	2408.00	26	2428.00	46	2448.00	66	2468.00
7	2409.00	27	2429.00	47	2449.00	67	2469.00
8	2410.00	28	2430.00	48	2450.00	68	2470.00
9	2411.00	29	2431.00	49	2451.00	69	2471.00
10	2412.00	30	2432.00	50	2452.00	70	2472.00
11	2413.00	31	2433.00	51	2453.00	71	2473.00
12	2414.00	32	2434.00	52	2454.00	72	2474.00
13	2415.00	33	2435.00	53	2455.00	73	2475.00
14	2416.00	34	2436.00	54	2456.00	74	2476.00
15	2417.00	35	2437.00	55	2457.00	75	2477.00
16	2418.00	36	2438.00	56	2458.00	76	2478.00
17	2419.00	37	2439.00	57	2459.00	77	2479.00
18	2420.00	38	2440.00	58	2460.00	78	**2480.00**
19	2421.00	39	**2441.00**	59	2461.00	/	/

Table 5: RF Channel and Frequency of Bluetooth LE

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
0	**2402**	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476

8	2418	18	2438	28	2458	38	2478
9	2420	**19**	**2440**	29	2460	**39**	**2480**

Table 6: RF Channel and Frequency of 2.4GHz Wi-Fi

RF Channel	802.11 b/g/n(HT20)	802.11 n(HT40)
	Frequency (MHz)	Frequency (MHz)
01	**2412**	
02	2417	
03	2422	**2422**
04	2427	2427
05	2432	2432
06	**2437**	2437
07	2442	2442
08	2447	2447
09	2452	**2452**
10	2457	
11	**2462**	

3.3 Independent Operation Modes

The basic operation modes are:

A. On, Bluetooth BR & EDR wireless transmitting (Low / Middle / High Channel)
B. On, Bluetooth LE wireless transmitting (Low / Middle / High Channel)
C. On, 2.4GHz Wi-Fi wireless transmitting (Low / Middle / High Channel)
D. On, Normal working+Bluetooth+2.4GHz Wi-Fi
E. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- Application Form
- ID Label and Location Info
- Schematics
- Operation Description
- Block Diagram
- PCB Layout

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All tests were performed according to the procedures in ANSI C63.10: 2013.

According to clause 3.1, all tests were performed on model Andes 1500 in this report.

4.3 Special Accessories and Auxiliary Equipment

Table 7: List of Accessories and Auxiliary Equipment

Items	Manufacturer	Model	Remark
Laptop	Lenovo	T480	SN: PF-16A6N8 Provided by test lab
Decoy load	N/A	4xLC-CMTPD	Provided by test lab
Decoy load	N/A	2xLC-CFTPD	Provided by test lab
Resistive load	N/A	2xLC-CE_FCC	Provided by test lab
Bulbs	N/A	6x300W	Provided by test lab
Router	TP-LINK	802.11n Router	Provided by test lab
iPad	Apple	iPad air	Provided by test lab
Extra Battery	Xiamen Ampace Technology Limited	Extra Battery	Provided by Manufacturer

Items	Description	Remark
Type-C-Cable *2	1.2m, Shielded, Detachabler	Provided by test lab
USB Cable * 4	1.2m, Shielded, Detachabler	Provided by test lab
Car socket	1m, Unshielded, Detachabler	Provided by test lab
DC 5521	1m, Unshielded, Detachabler	Provided by test lab
AC Cable	1.3m, Shielded, Detachabler	Provided by test lab

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

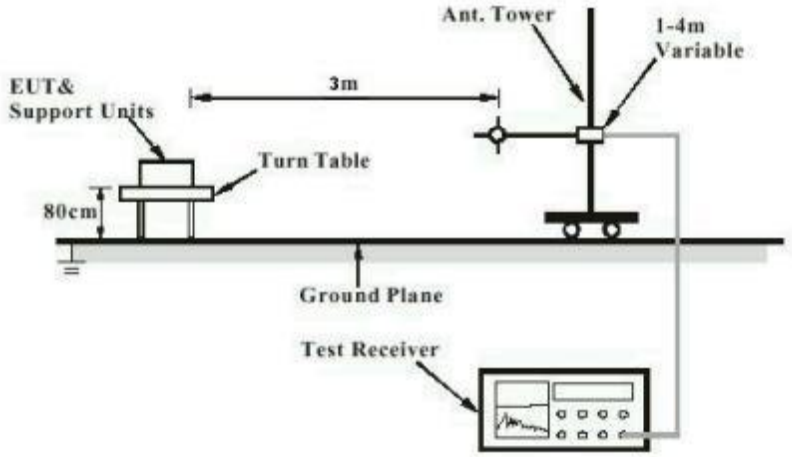


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

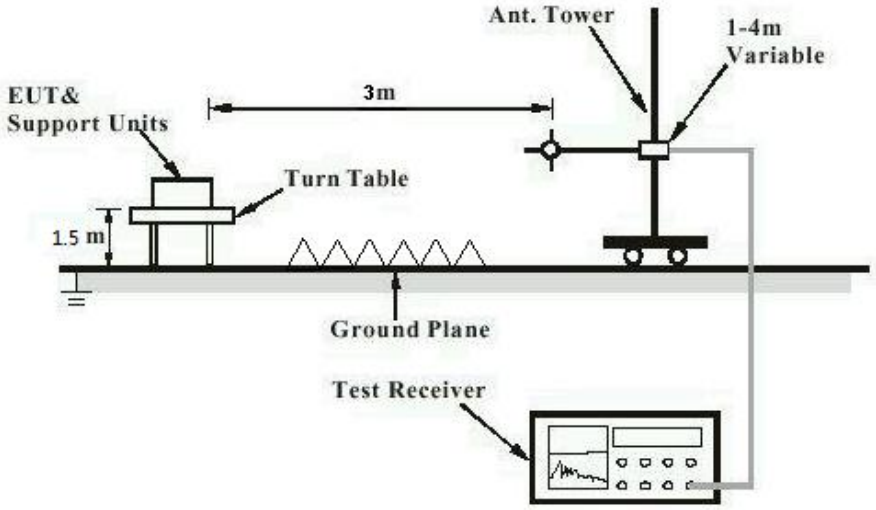


Diagram of Measurement Configuration for Mains Conduction Measurement

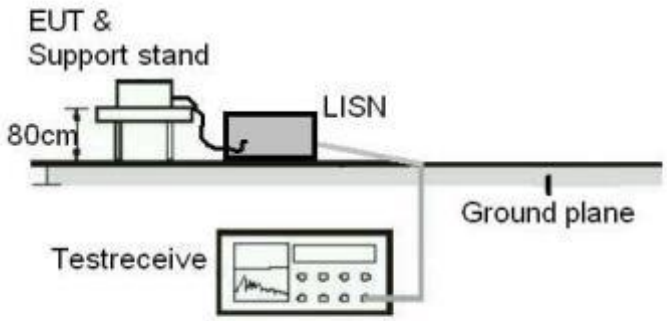
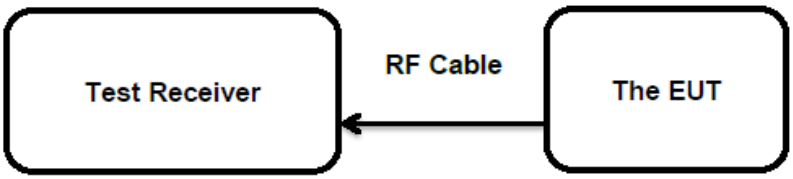


Diagram of Measurement Configuration for Conducted Transmitter Measurement



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT: **Pass**

Test Specification

Test standard : FCC Part 15.247(b)(4) and Part 15.203
RSS-Gen Section 6.8

According to the manufacturer declared, the EUT has a Metal antenna, the directional gain of antenna is 4.26dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement.

Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

5.1.2 Radiated Spurious Emission

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(d) & FCC Part 15.205 RSS-247 Clause 3.3
Basic standard	:	ANSI C63.10: 2013
Limits	:	Refer to 15.209(a) of FCC part 15.247(d) RSS-Gen Table 5
Kind of test site	:	3m Semi-anechoic Chamber

Test Setup

Date of testing	:	2024-06-14 to 2024-07-11
Input voltage	:	Fully charged battery
Operation mode	:	A, B, C
Test channel	:	Low / Middle / High
Ambient temperature	:	Refer to test result
Relative humidity	:	Refer to test result
Atmospheric pressure	:	101 kPa

Remark:
Testing was carried out within frequency range 9kHz to the tenth harmonics. Only the worst case spurious emissions configuration of the each mode were reported.

For the measurement records, refer to the appendix A.

5.1.3 Conducted Emission on AC Mains

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.107(b) ICES-003 Section 3.2.1
Basic standard	:	ANSI C63.4: 2014
Frequency range	:	0.15 – 30MHz
Classification of equipment	:	Class A
Limits	:	FCC Part 15.107(b) ICES-003 Table 1
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2024-07-09
Input voltage	:	AC 120V, 60Hz
Operation mode	:	D
Earthing	:	Not connected
Ambient temperature	:	24.2 ℃
Relative humidity	:	53 %
Atmospheric pressure	:	101.1 kPa

For the measurement records, refer to the appendix A.

6 Photographs of the Test Set-Up

For photographs of the test set-up, refer to the appendix B.

7 List of Tables

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