TEST REPORT

Applicant	NINGBO REALWAY ELECTRICAL CO., LTD.
Address	NO.38, XIANGQIAO ROAD, LANGXIA, YUYAO, NINGBO, CHINA.

Manufacturer or Supplier	NINGBO REALWAY ELECTRICAL CO., LTD.
Address	NO.38, XIANGQIAO ROAD, LANGXIA, YUYAO, NINGBO, CHINA.
Product	Dehumidifier
Brand Name	N/A
Model	DH2000B
Additional Model & Model Difference	DH2000A,DH2000C,DH2000D,DH2000E,DH 2000F, etc; see item 1.1
Date of tests	Mar. 10, 2022 ~ Mar. 22, 2022

The submitted samples of the above equipment have been tested according to the requirements of the following standards:

☒ **EN IEC 55014-1:2021**
☒ **EN IEC 55014-2:2021**
☒ **EN IEC 61000-3-2:2019+A1:2021**
☒ **EN 61000-3-3:2013+A2:2021**

CONCLUSION: The submitted samples were found to COMPLY with the test requirement

Tested by Lucas Chen Project Engineer / EMC Department	Approved by Glyn He Assistant Manager / EMC Department
Lucas	Date: Jul. 22, 2024

This report is governed by, and incorporates by reference, the Conditions of Testing as posted at the date of issuance of this report at http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/ and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. Statements of conformity are based on simple acceptance criteria without taking measurement uncertainty into account, unless otherwise requested in writing. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.

Bureau Veritas Shenzhen Co., Ltd.
Dongguan Branch

No. 96, Guantai Road (Houjie Section), Houjie Town, Dongguan City, Guangdong Province. 523942. People's Republic of China.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
CE2203WDG0091	Original release	Apr. 07, 2022
CE2407WDG0194	Based on the original report CE2203WDG0091 updated standard version, but it doesn't need to be retested.	Jul. 22, 2024

1 GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Dehumidifier
MODEL NO.	DH2000B
ADDITIONAL MODELS	DH2000A, DH2000C, DH2000D, DH2000E, DH2000F, DH2000G, DH2200A, DH2200B, DH2200C, DH2200D, DH2200E, DH2200F, DH2200G, DH1500A, DH1500B, DH1500C, DH1500D, DH1500E, REAL10A, REAL10B, REAL10C, REAL10D, REAL10E, REAL12A, REAL12B, REAL12C, REAL12D, REAL12E.
POWER SUPPLY	AC 220-240V 50/60Hz,65W or DC 12V 5A from DC Source
GROUP / CATEGORY	Category II
THE HIGHEST CLOCK FREQUENCY	Below 15MHz
CABLE SUPPLIED	AC Line: Unshielded, detachable, 1.2m

Notes:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
3. Please refer to the EUT photo document (Reference No.: 2407WDG0194) for detailed product photo.
4. Additional models (see above table) are identical with the test model DH2000B except the appearance, trade name and model No. for trading purpose.

1.2 DESCRIPTION OF TEST MODES

The EUT were tested under the following modes, the final worst mode was marked in boldface and recorded in this report.

FOR Terminal continuous disturbance voltage emission test:

MODE	Description of Test Mode	Test Voltage
1	**Normal working**	**AC 230V 50Hz**
2	Standby	

FOR Disturbance power emission test:

MODE	Description of Test Mode	Test Voltage
1	**Normal working**	**AC 230V 50Hz**
2	Standby	
3	Normal working	DC 12V from DC Source

FOR HARMONIC, FLICKERED TESTS:

MODE	Description of Test Mode	Test Voltage
1	**Normal working**	**AC 230V 50Hz**

FOR ESD IMMUNITY TEST:

MODE	Description of Test Mode	Test Voltage
1	**Normal working**	**AC 230V 50Hz**
2	**Standby**	
3	**Normal working**	**DC 12V from DC Source**

FOR OTHER IMMUNITY TESTS :

MODE	Description of Test Mode	Test Voltage
1	**Normal working**	**AC 230V 50Hz**
2	**Standby**	

1.3 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

EMISSION				
Standard	**Test Type**	**Result**	**Remark**	**Test Location**
EN IEC 55014-1: 2021	Terminal continuous disturbance voltage emission test	PASS	Meets Limits Minimum passing margin is -4.48dB at 0.16932MHz	B
	Disturbance power emission test	PASS	Meets requirement limit Minimum passing margin is -3.38 dB at 34.56250MHz	B
EN IEC 61000-3-2: 2019+A1:2021	Harmonic current emissions	PASS	Meets the requirements.	B
EN 61000-3-3: 2013+A2:2021	Voltage fluctuations & flicker	PASS	Meets the requirements.	B

Note:

Test Location:

A: No. 96, Guantai Road (Houjie Section), Houjie Town, Dongguan City, Guangdong Province. 523942. People's Republic of China.

B: No. 122, Houjie Avenue West Houjie Town, Dongguan City Guangdong Province, 523960, People's Republic of China.

IMMUNITY EN IEC 55014-2:2021				
Standard	**Test Type**	**Result**	**Remark**	**Test Location**
IEC 61000-4-2: 2008 ED. 2.0	Electrostatic discharge immunity test	PASS	Meets the requirements of Performance Criterion A	B
IEC 61000-4-4: 2012 ED. 3.0	Electrical fast transient / burst immunity test.	PASS	Meets the requirements of Performance Criterion A	B
IEC 61000-4-5: 2017 ED. 3.1	Surge immunity test	PASS	Meets the requirements of Performance Criterion A	B
IEC 61000-4-6: 2023 ED. 5.0	Immunity to conducted disturbances, induced by radio-frequency fields	PASS	Meets the requirements of Performance Criterion A	B
IEC 61000-4-11: 2020 ED. 3.0	Voltage dips, short interruptions and voltage variations immunity tests	PASS	Meets the requirements of Voltage dips and interruption: 0% U_T – 0.5 period, Performance Criterion A 40% U_T – 10 period, Performance Criterion A 70% U_T – 25 period, A	B

Note:

Test Location:

A: No. 96, Guantai Road (Houjie Section), Houjie Town, Dongguan City, Guangdong Province. 523942. People's Republic of China.

B: No. 122, Houjie Avenue West Houjie Town, Dongguan City Guangdong Province, 523960, People's Republic of China.

2 EMISSION TEST

2.1 TERMINAL CONTINUOUS DISTURBANCE VOLTAGE EMISSION MEASUREMENT

2.1.1 TEST INSTRUMENTS

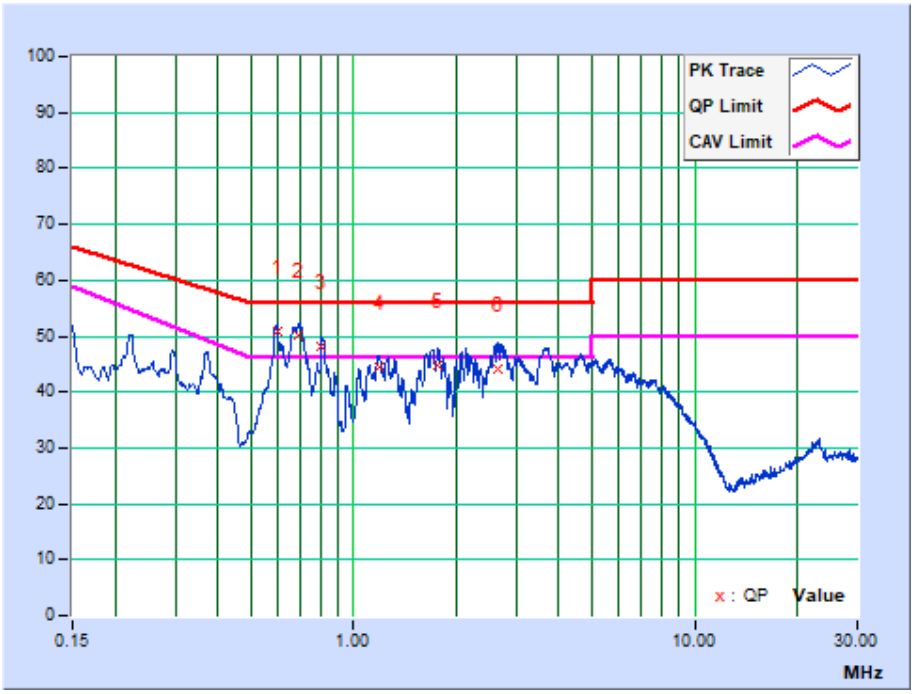
Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	100666	July 04,22
Artificial Mains Network	Rohde&Schwarz	ENV216	102477	July 12,22
Artificial Mains Network	SCHWARZBECK	NSLK 8127	8127713	May 08,23
Voltage Probe	SCHWARZBECK	TK 9421	9421-0332	Aug. 22,22
Current Probe	Rohde&Schwarz	EZ-17	0816.2063.02	Sep. 21, 22
ISN	Rohde&Schwarz	ENY81-CA6	101928	Sep. 16, 22
ISN	TESEQ	ISN T800	34373	Feb. 16, 23
Coaxial RF Cable	COMMATE	CFD300-NL	5D-001	Oct. 19,22
Shielding Room	Burgeon	5m*4m*3m	D3040008DG-1	July 22, 22
Test software	ADT	ADT_Cond_V7.3.7	N/A	N/A

NOTES:
1. The test was performed in shielded room 553.
2. Peak and average detector quick scan are showed on the graph and final quasi-peak and average detector data are measured, the worst-case is recorded in the following graph and table.
3. Frequency range scanned: 150kHz to 30MHz.
4. Only emissions significantly above equipment noise floor are reported.
5. Uncertainty: ±3.36dB at a level of confidence of 95%.
6. Equipment are calibrated by calibration laboratory accredited to ISO/IEC 17025 by a mutually recognized Accreditation.

2.1.2 TEST RESULTS

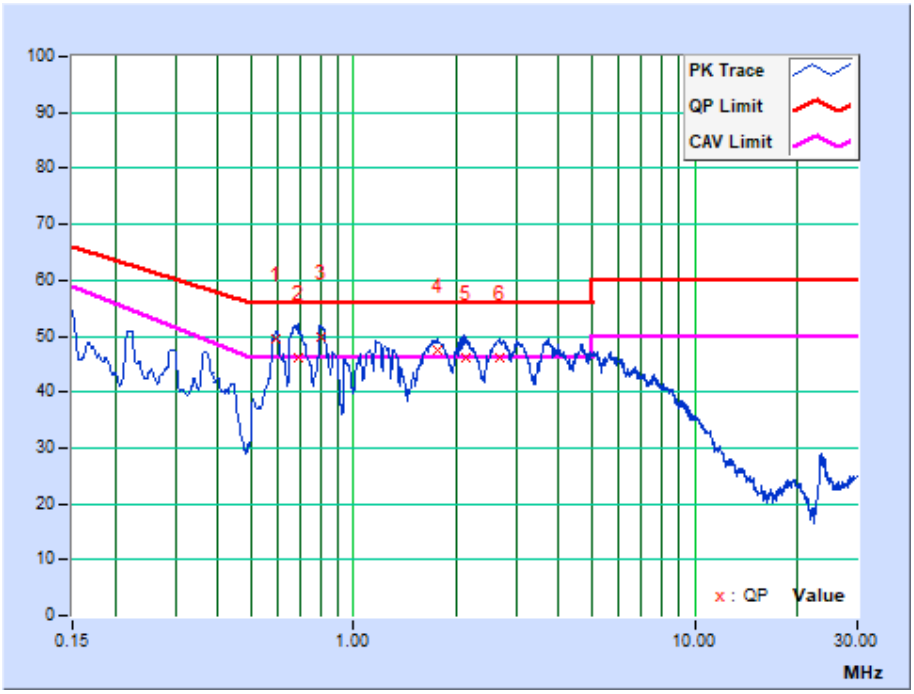
TEST MODE	Normal working	**6DB BANDWIDTH**	9 kHz
TEST VOLTAGE	AC 230V 50Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	25deg. C, 58%RH	**TESTED BY**	Ming Bai
TEST DATE	Mar. 06, 2022		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.59550	9.60	41.12	34.30	50.72	43.90	56.00	46.00	-5.28	-2.10
2	**0.69303**	**9.59**	**40.50**	**34.60**	**50.09**	**44.19**	**56.00**	**46.00**	**-5.91**	**-1.81**
3	0.80559	9.57	38.60	30.10	48.17	39.67	56.00	46.00	-7.83	-6.33
4	1.18448	9.51	34.83	24.98	44.34	34.49	56.00	46.00	-11.66	-11.51
5	1.76007	9.38	35.50	23.48	44.88	32.86	56.00	46.00	-11.12	-13.14
6	2.64075	9.34	34.81	22.96	44.15	32.30	56.00	46.00	-11.85	-13.70



TEST MODE	Normal working	6DB BANDWIDTH	9 kHz
TEST VOLTAGE	AC 230V 50Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	25deg. C, 58%RH	TESTED BY	Ming Bai
TEST DATE	Mar. 06, 2022		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.59306	9.40	40.20	33.00	49.60	42.40	56.00	46.00	-6.40	-3.60
2	0.68550	9.41	36.68	26.01	46.09	35.42	56.00	46.00	-9.91	-10.58
3	0.79800	9.41	40.50	30.90	49.91	40.31	56.00	46.00	-6.09	-5.69
4	1.76325	9.44	37.89	27.00	47.33	36.44	56.00	46.00	-8.67	-9.56
5	2.13000	9.45	36.51	25.76	45.96	35.21	56.00	46.00	-10.04	-10.79
6	2.68125	9.45	36.77	25.35	46.22	34.80	56.00	46.00	-9.78	-11.20



2.2 DISTURBANCE POWER EMISSION MEASUREMENT

2.2.1 TEST INSTRUMENTS

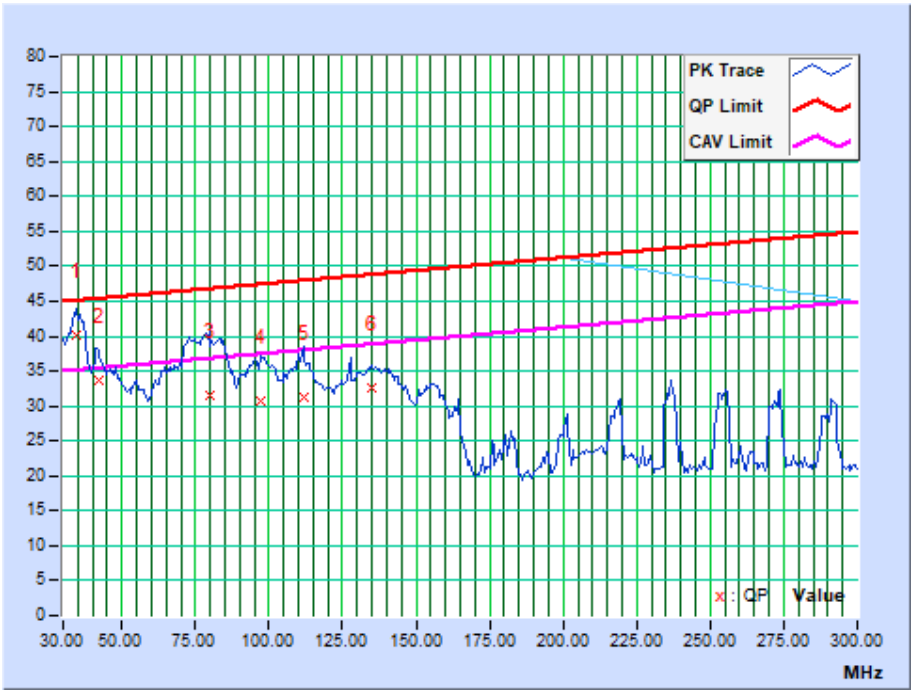
Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCS30	100340	Jan. 18,23
Absorbing Clamp	Rohde&Schwarz	MDS-21	100084	May 15,22
Test software	ADT	ADT_Clamp_V7.3.7	N/A	N/A

Notes:
1. The test was performed in shielding Room 843.
2. Peak and average detector quick scan are showed on the graph and final quasi-peak and average detector data are measured, the worst-case is recorded in the following graph and table.
3. Frequency range scanned: 30MHz to 300MHz.
4. Only emissions significantly above equipment noise floor are reported.
5. Uncertainty: ±4.84dB at a level of confidence of 95%.
6. Equipment are calibrated by calibration laboratory accredited to ISO/IEC 17025 by a mutually recognized Accreditation.

2.2.2 TEST RESULTS

TEST MODE	Normal working	**FREQUENCY RANGE**	30-300 MHz
TEST VOLTAGE	AC 230V 50Hz	**DETECTOR FUNCTION & BANDWIDTH**	Quasi-Peak/ Average, 120kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 55% RH	**TESTED BY**	Cheng Zhong
TEST DATE	Mar. 22, 2022		

NO	Freq.	Corr. Factor	Reading Value (dBpW)		Emission Level (dBpW)		Limit (dBpW)		Margin (dB)	
	(MHz)	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**34.56250**	**10.19**	**30.00**	**21.60**	**40.19**	**31.79**	**45.17**	**35.17**	**-4.98**	**-3.38**
2	42.00000	7.61	26.19	10.51	33.80	18.12	45.44	35.44	-11.64	-17.32
3	79.87500	7.46	24.18	16.94	31.64	24.40	46.85	36.85	-15.21	-12.45
4	97.43750	5.81	24.90	17.24	30.71	23.05	47.50	37.50	-16.79	-14.45
5	111.62500	6.91	24.39	17.18	31.30	24.09	48.02	38.02	-16.73	-13.94
6	134.68750	5.65	26.99	20.20	32.64	25.85	48.88	38.88	-16.23	-13.02



2.3 HARMONICS CURRENT MEASUREMENT

2.3.1 LIMITS OF HARMONICS CURRENT MEASUREMENT

TEST STANDARD: EN IEC 61000-3-2

Limits for Class A equipment	
Harmonic Order n	Max. permissible harmonics current A
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
15<=n<=39	0.15x15/n
Even harmonics	
2	1.08
4	0.43
6	0.30
8<=n<=40	0.23x8/n

Limits for Class D equipment		
Harmonic Order n	Max. permissible harmonics current per watt mA/W	Max. permissible harmonics current A
Odd Harmonics only		
3	3.4	2.30
5	1.9	1.14
7	1.0	0.77
9	0.5	0.40
11	0.35	0.33
13	0.30	0.21
15<=n<=39	3.85/n	0.15x15/n

NOTES: 1. Class A and Class D are classified according to section 5 of EN IEC 61000-3-2.

2. According to section 7 of EN IEC 61000-3-2, the above limits for all equipment except for lighting equipment having an active input power > 5 W and no limits apply for equipment with an active input power up to and including 75 W.

♦ **Limits for Class B equipment:**

For class B equipment, the harmonics of the input current shall not exceed the maximum permissible values given for class A equipment multiplied by a factor of 1.5.

Limits for Class C equipment	
Harmonic Order n	Max. permissible harmonics current expressed as a percentage of the input current at the fundamental frequency %
2	2
3	27
5	10
7	7
9	5
11<=n<=39 (odd harmonics only)	3
* λ is the circuit power factor	

NOTE: 1. Lighting equipment having a rated power greater than or equal to 5 W and less than or equal to 25 W shall not exceed the power-related limits of class D, column 2. or the third harmonic current, expressed as a percentage of the fundamental current, shall not exceed 86 % and the fifth harmonic current shall not exceed 61 %. In addition, the waveform of the input current shall be such that it reaches the 5 % current threshold before or at 60°, has its peak value before or at 65° and does not fall below the 5 % current threshold before 90°, referenced to any zero crossing of the fundamental supply voltage. Or the *THD* shall not exceed 70 %. The third order harmonic current, expressed as a percentage of the fundamental current, shall not exceed 35 %, the fifth order current shall not exceed 25 %, the seventh order current shall not exceed 30 %, the ninth and eleventh order currents shall not exceed 20 % and the second order current shall not exceed 5 %.

2. For luminaires with incandescent lamps and built-in phase control dimming having a rated power greater than 25 W, the harmonics of the input current shall not exceed the Class C equipment limits.

2.3.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
3kVA AC Power Source	California Instruments	3001 iX	54140	Feb. 23, 23
Harmonic/Flicker Test System	California Instruments	PACS-1	1319A01862	Feb. 23, 23
Test Software	California Instruments	CTS 4 – V4.29.0	N/A	N/A

NOTES: 1. The test was performed in EMS Room.

2. Equipment are calibrated by calibration laboratory accredited to ISO/IEC 17025 by a mutually recognized Accreditation.

2.3.3 TEST PROCEDURE

a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under Normal Operating conditions for each successive harmonic component in turn.

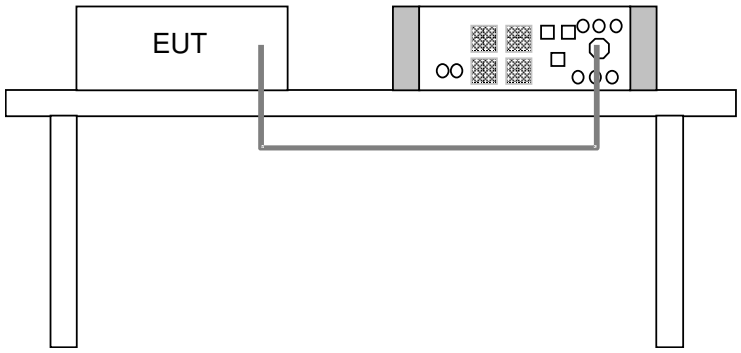
b. The classification of EUT is according to section 5 of EN IEC 61000-3-2.
The EUT is classified as follows:
Class A: Balanced three-phase equipment, household appliances, excluding those specified as belonging to Class B, C or D, vacuum cleaners. high pressure cleaners, tools, excluding portable tools, independent phase control dimmers, audio equipment, professional luminaires for stage lighting and studios.
Class B: Portable tools.; Arc welding equipment which is not professional equipment.
Class C: Lighting equipment.
Class D: Equipment having a specified power less than or equal to 600 W of the following types: Personal computers and personal computer monitors and television receivers and refrigerators and freezers having one or more. variable-speed drives to control compressor motor(s).

The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen.
The measure time shall be not less than the time necessary for the EUT to be exercised.

2.3.4 DEVIATION FROM TEST STANDARD

No deviation.

2.3.5 TEST SETUP



2.3.6 EUT OPERATING CONDITIONS

Same as item 3.1.6

2.3.7 TEST RESULTS

The limits are not specified for equipment with a rated power of 75W or less (other than lighting equipment).The EUT is not required to meet this test item as its power consumption is lower than 75W.

For further details, please refer to Clause 7 of EN IEC 61000-3-2:2019.

2.4 VOLTAGE FLUCTUATION AND FLICKERS MEASUREMENT

2.4.1 LIMITS

Test item	Limit	Note
P_{st}	1.0	P_{st}: short-term flicker severity.
P_{lt}	0.65	P_{lt}: long-term flicker severity.
T_{max} (ms)	500	T_{max}: maximum time duration during the observation period that the voltage deviation d(t) exceeds the limit for d_c .
d_{max} (%)	4	d_{max}: maximum absolute voltage change during an observation period.
d_c (%)	3.3	d_c: maximum steady state voltage change during an observation period.

2.4.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
3kVA AC Power Source	California Instruments	3001 iX	54140	Feb. 23, 23
Harmonic/Flicker Test System	California Instruments	PACS-1	1319A01862	Feb. 23, 23
Test Software	California Instruments	CTS 4 – V4.29.0	N/A	N/A

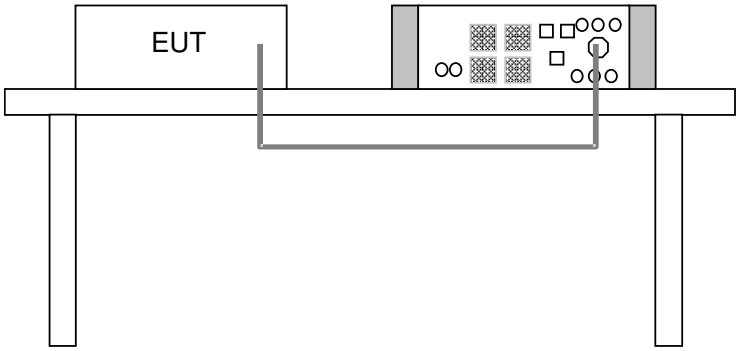
NOTES: 1. The test was performed in EMS Room.
2. Equipment are calibrated by calibration laboratory accredited to ISO/IEC 17025 by a mutually recognized Accreditation.

2.4.3 TEST ARRANGEMENT

a. The EUT was placed on the top of a wooden table 0.1 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under Normal Operating conditions.

b. During the flick measurement, the measure time shall include that part of whole operation cycle in which the EUT produce the most unfavorable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

2.4.4 TEST SETUP



2.4.5 TEST RESULTS

Observation (T_p)	120 min.	Test Date	2022/03/21
Fundamental Voltage/Ampere	229.86Vrms	Power Frequency	50.00Hz
Environmental Conditions	26.0deg. C, 57.0% RH	Tested by	Cheng zhong
Test Mode	Normal working		

Test Parameter	Measurement Value	Limit	Remarks
P_{st}	0.064	1.00	Pass
P_{lt}	0.126	0.65	Pass
T_{max} (ms)	0.0	500	Pass
d_{max} (%)	0.00	4	Pass
d_c (%)	0.00	3.3	Pass

Note: (1) P_{st} means short-term flicker indicator.
(2) P_{lt} means long-term flicker indicator.
(3) T_{max} means accumulated time value of d(t) with a deviation exceeding 3.3 %.
(4) d_{max} means maximum relative voltage change.
(5) d_c means maximum relative steady-state voltage change.

3 IMMUNITY TEST

3.1 GENERAL PERFORMANCE CRITERIA DESCRIPTION

CRITERION A	The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
CRITERION B	The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however, No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
CRITERION C	Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

3.2 ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

3.2.1 TEST SPECIFICATION

Basic Standard:	IEC 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Discharge Voltage:	Air Discharge: 8 kV (Direct)
	Contact Discharge: 4 kV (Direct & Indirect)
Polarity:	Positive & Negative
Number of Discharge:	20 times at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1 second

3.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
ESD Generator	TESEQ	NSG 437	603	Mar. 16, 23
Test Software	TESEQ	V03.03	N/A	N/A

NOTES: 1. The test was performed in ESD Room.

2. Equipment are calibrated by calibration laboratory accredited to ISO/IEC 17025 by a mutually recognized Accreditation.

3.2.3 TEST RESULTS

TEST MODE	Normal working	TEST VOLTAGE	AC 230V 50Hz
ENVIRONMENTAL CONDITIONS	22.3deg. C, 51.7% RH, 101.2kPa	TESTED BY: Ming Bai	
TEST DATE	Mar. 22, 2022		

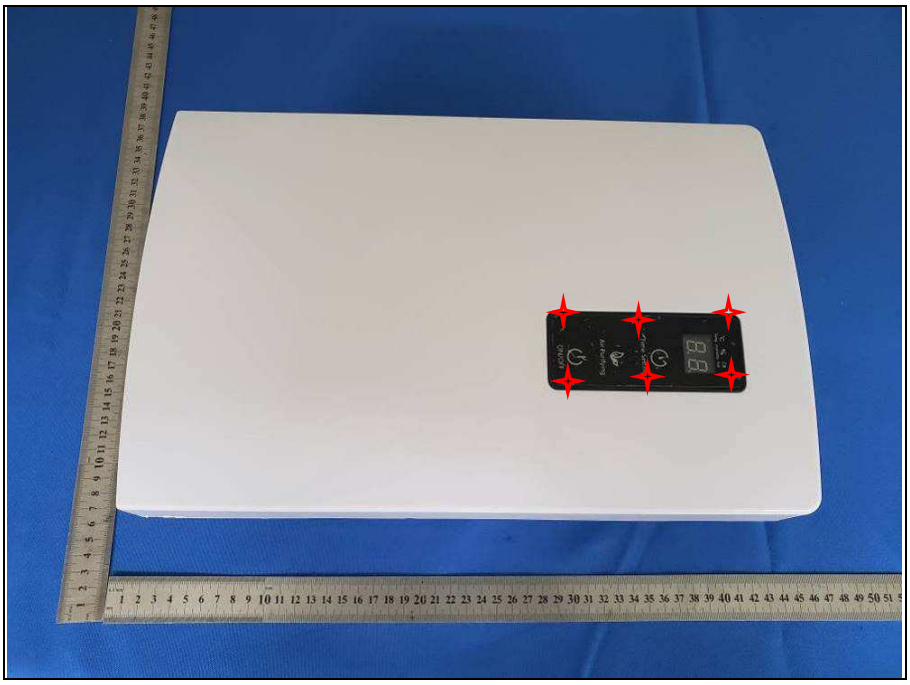
Direct Discharge Application				
Test Level (kV)	Polarity	Test Point	Test Result of Contact Discharge	Test Result of Air Discharge
4	+/-	All Metal Parts	A	N/A
8	+/-	All non-metal Part	N/A	A

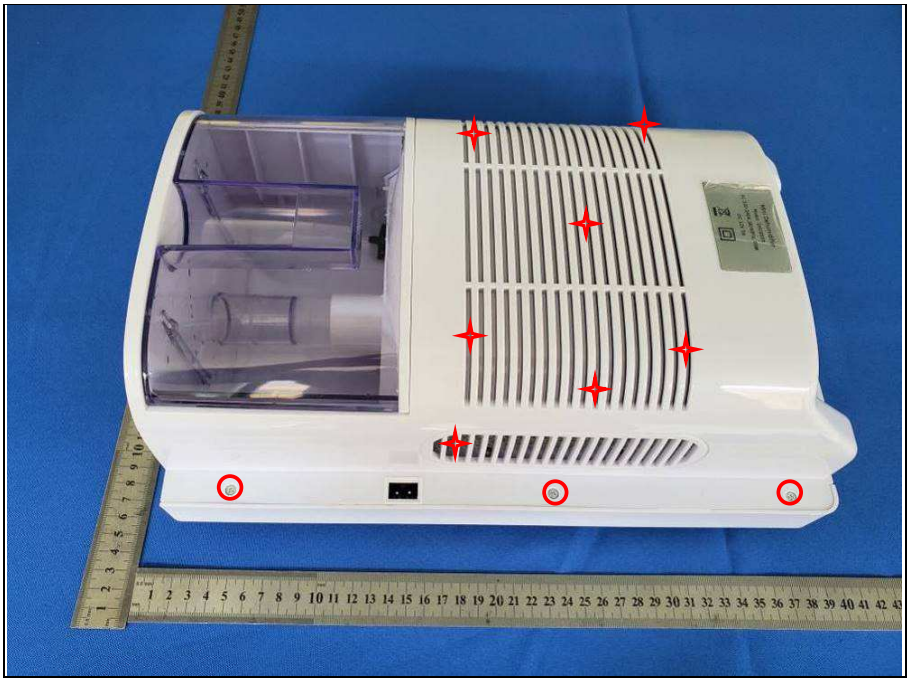
Indirect Discharge Application				
Discharge Level (kV)	Polarity	Test Point	Test Result of HCP	Test Result of VCP
4	+/-	VCP	N/A	A

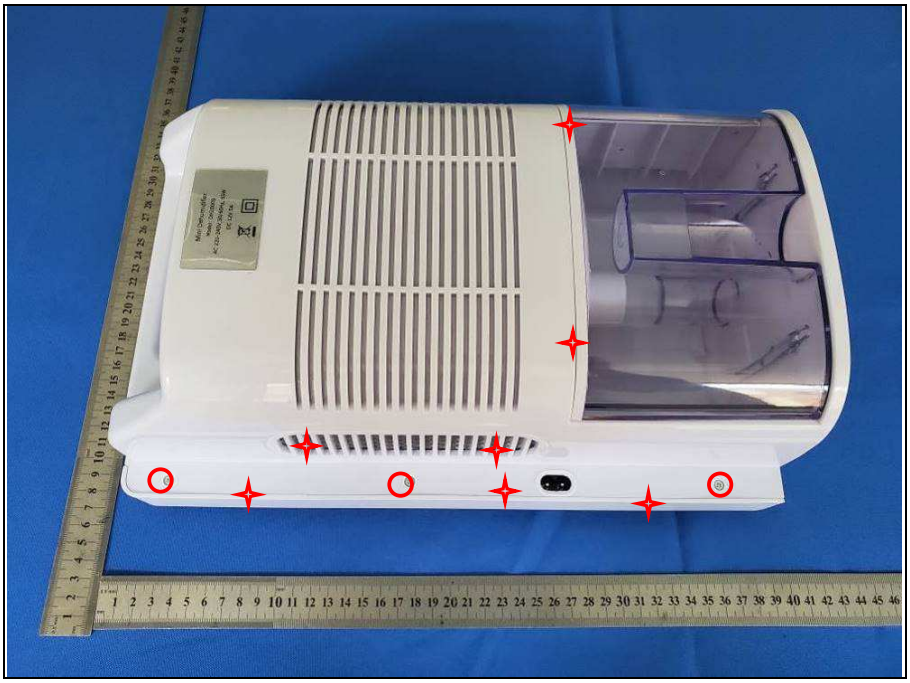
NOTE: A: There was no change compared with initial operation during the test.

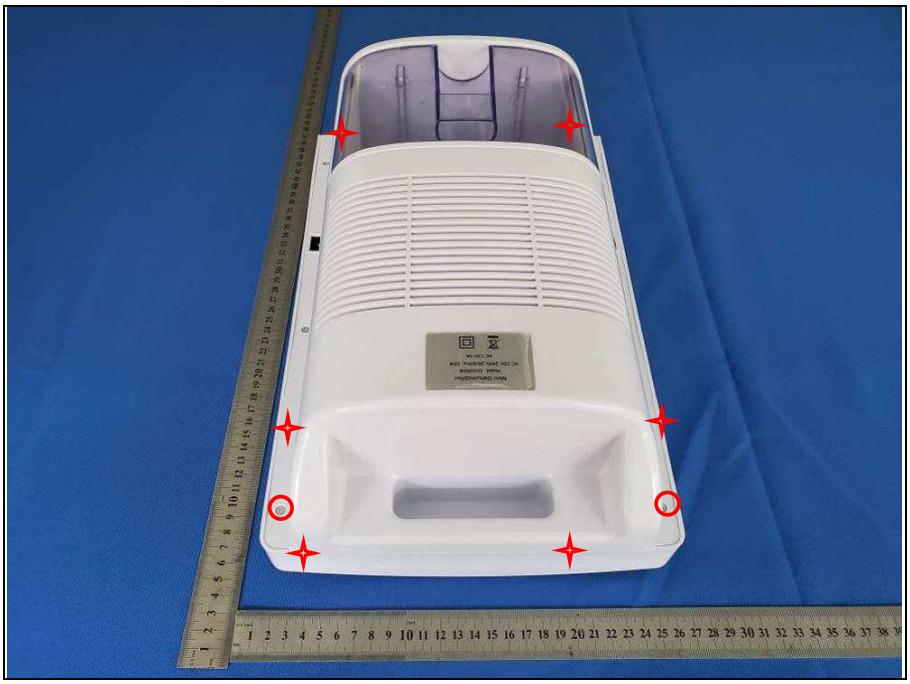
ESD TEST POINT

O(- Direct Contact Discharge, -Air Discharge)









3.3 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST (EFT)

3.3.1 TEST SPECIFICATION

Basic Standard:	IEC 61000-4-4
Test Voltage:	Power Line: 1 kV
Polarity:	Positive & Negative
Impulse Frequency:	5 kHz
Impulse Waveshape:	5/50 ns
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	2 minutes

3.3.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
CM-TELCD Telecom Coupler/De-coupler	Thermo Fisher SCIENTIFIC	CM-TELCD	1112216	Jun. 01, 22
Capacitor Clamp	Thermo Fisher SCIENTIFIC	CCL-A	1112111	Apr. 06, 22
Test Software	Thermo Fisher SCIENTIFIC	CE ware32	V4.1	N/A
EFT Tester	HAEFELY	PEFT4010	150546	Jan. 18,23
EFT Coupling Clamp	HAEFELY	IP4A	150407	Jan. 18,23
Test Software	HAEFELY	SWPE4010 1.22	N/A	N/A

NOTES: 1. The test was performed in EMS Room.

2. Equipment are calibrated by calibration laboratory accredited to ISO/IEC 17025 by a mutually recognized Accreditation.

3.3.3 TEST RESULTS

TEST MODE	Normal Working	TEST VOLTAGE	AC 230V 50Hz
ENVIRONMENTAL CONDITIONS	23.5DEG. C, 60.5% RH	TESTED BY: Cheng Zhong	
TEST DATE	Mar. 22, 2022		

Pulse Voltage	1 kV		_ kV		___ kV		___ kV	
Pulse Polarity	+	—	+	—	+	—	+	—
L	A	A	/	/	/	/	/	/
N	A	A	/	/	/	/	/	/
L+N	A	A	/	/	/	/	/	/

NOTE: A: There was no change compared with initial operation during the test.

3.4 SURGE IMMUNITY TEST

3.4.1 TEST SPECIFICATION

Basic Standard:	IEC 61000-4-5
Wave-Shape:	Combination Wave 1.2/50 us Open Circuit Voltage 8 /20 us Short Circuit Current
Test Voltage:	Power Line: 1kV, 2kV
Surge Input/Output:	L-N,
Generator Source Impedance:	2 ohm between networks 12 ohm between networks and ground
Polarity:	Positive/Negative
Phase Angle:	90°/270°
Pulse Repetition Rate:	1 time / 60 Sec.
Number of Tests:	5 positive and 5 negative at selected points

3.4.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
CM-TELCD Telecom Coupler/De-coupler	Thermo Fisher SCIENTIFIC	CM-TELCD	1112216	Jun. 01, 22
I/O Line Coupler/De-coupler	Thermo Fisher SCIENTIFIC	CM-I/OCD	1112214	Jun. 01, 22
Test Software	Thermo Fisher SCIENTIFIC	CE ware32	V4.1	N/A

NOTES: 1. The test was performed in EMS Room.

2. Equipment are calibrated by calibration laboratory accredited to ISO/IEC 17025 by a mutually recognized Accreditation.

3.4.3 TEST RESULTS

TEST MODE	Normal working	TEST VOLTAGE	AC 230V 50Hz
ENVIRONMENTAL CONDITIONS	23.5deg. C, 60.5% RH	TESTED BY: Ming Bai	
TEST DATE	Mar. 22, 2022		

AC Power port：

\Phase angle \ Test result \Voltage (kV) \ Test point\ Polarity			0°	90°	180°	270°	/	DC Power Port
1.0	L-N	+	/	A	/	/	/	/
		−	/	/	/	A	/	/

NOTE: A: There was no change compared with initial operation during the test.

3.5 IMMUNITY TO CONDUCTED DISTURBANCES INDUCED BY RF FIELDS (CS)

3.5.1 TEST SPECIFICATION

Basic Standard:	IEC 61000-4-6
Frequency Range:	0.15 MHz - 230 MHz
Field Strength:	3 $V_{r.m.s.}$
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Coupled Cable:	Power Mains
Coupling Device:	CDN-M2(2wires)

3.5.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
Signal Generator	Rohde&Schwarz	SMC 100A	107350	Jul. 04, 22
Power Meter	Rohde&Schwarz	NRX	103107	Aug. 06, 22
Power Sensor	Rohde&Schwarz	NRP6A	103356	Aug. 06, 22
CDN	TESEQ	CDN M016	59949	Jul. 12, 22
CDN	COM-POWER	T2E	581001	Feb. 16, 23
CDN	COM-POWER	T8	581547	Feb. 16, 23
CDN	COM-POWER	M325E	521114	Feb. 16, 23
CDN	TESEQ	CDN T800	59708	Sep. 16,22
6dB 150Watt Attenuator	GUBO	N-CA100W06-3G	210712	Aug. 06, 22
Power Amplifier	PRANA	N-DR 290	2105-2867	Jul. 04, 22
Electromagnetic Injection Clamp	AMETEK	KEMZ801A	59633	May 15, 22
Audio analyzer	Rohde&Schwarz	UPV	100508	Apr. 13, 22
Conditioning Amplifier	B&K	2690-W-013	3009832	Feb. 27, 23
EAR SIMULATOR	B&K	4192-L-001	3192610	Jan. 24, 23
Test Software	Tonscend	TS+	4.0.0.0	N/A

NOTES: 1. The test was performed in CS Room.

2. Equipment are calibrated by calibration laboratory accredited to ISO/IEC 17025 by a mutually recognized Accreditation.

3.5.3 TEST RESULTS

TEST MODE	Normal working	TEST VOLTAGE	AC 230V 50Hz
ENVIRONMENTAL CONDITIONS	22.1deg. C, 51.7% RH	TESTED BY: Ming Bai	
TEST DATE	Mar. 22, 2022		

Voltage (V)	Test Frequency (MHz)	Tested Line	Injection Method.	Test Result	Remark
3	0.15-230	AC Line	CDN-M2	A	Pass

NOTE: A: There was no change compared with initial operation during the test.

3.6 VOLTAGE DIP/SHORT INTERRUPTIONS/VOLTAGE VARIATIONS (DIP) IMMUNITY TEST

3.6.1 TEST SPECIFICATION

Basic Standard:	IEC 61000-4-11
Test Duration Time:	Three test events in sequence
Interval between Event:	10 seconds
Phase Angle:	0° & 180°
Test Cycle:	3 times

3.6.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
3kVA AC Power Source	California Instruments	3001 iX	54140	Feb. 23, 23
Harmonic/Flicker Test System	California Instruments	PACS-1	1319A01862	Feb. 23, 23

NOTES: 1. The test was performed in EMS Room.
2. Equipment are calibrated by calibration laboratory accredited to ISO/IEC 17025 by a mutually recognized Accreditation.

3.6.3 TEST RESULTS

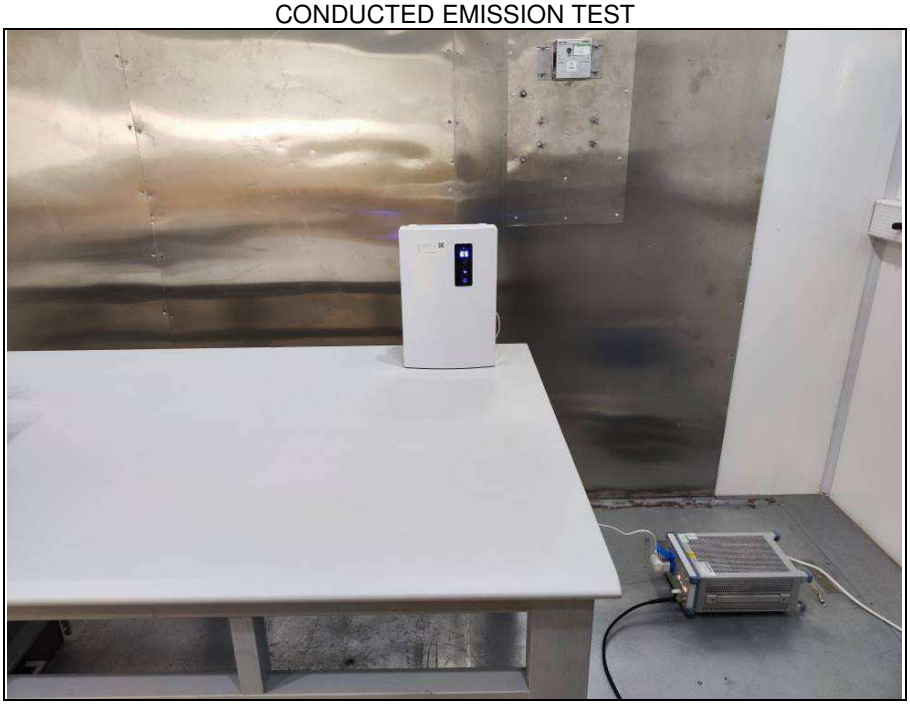
TEST MODE	Normal working	**TEST VOLTAGE**	AC 230V 50Hz
ENVIRONMENTAL CONDITIONS	23.5deg. C, 60.5% RH	**TESTED BY**: Cheng Zhong	
TEST DATE	Mar. 22, 2022		

Ut: 230 Vac 50 Hz	Durations		Event interval (sec)	Total events (time)	Test result
Voltage dips (%)	(period)	(ms)			
0	0.5	10	10	3	A
70	25	500	10	3	A
40	10	200	10	3	A

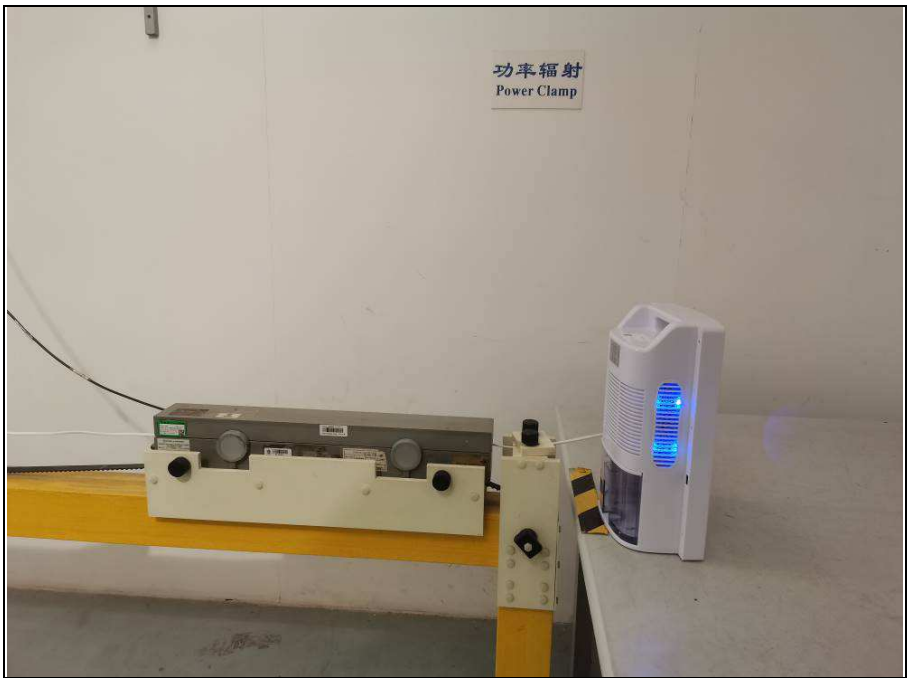
NOTE: A: There was no change compared with initial operation during the test.

4 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST



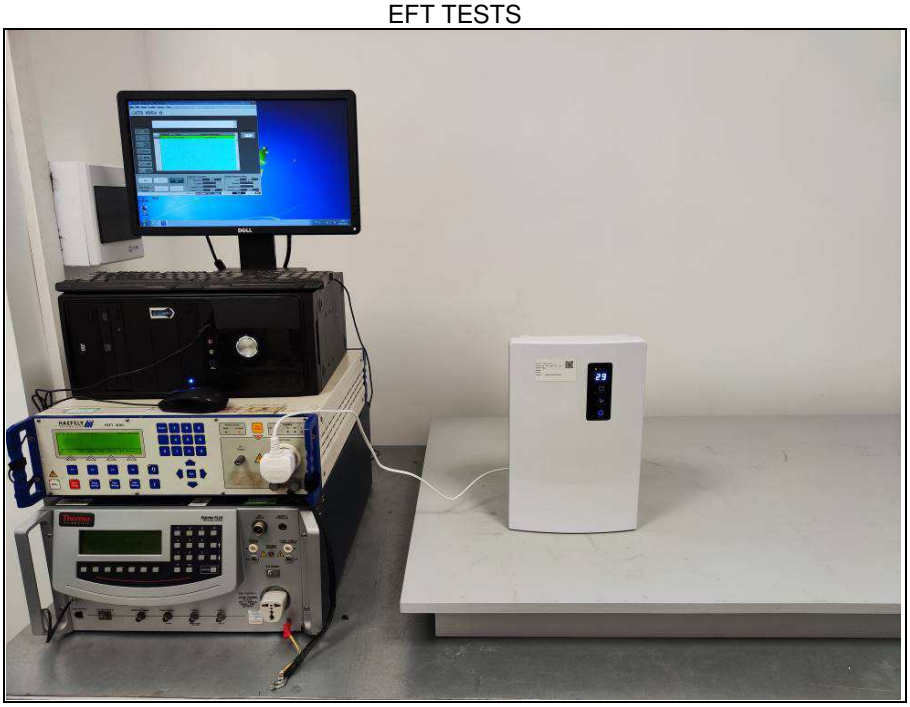
DISTURBANCE POWER



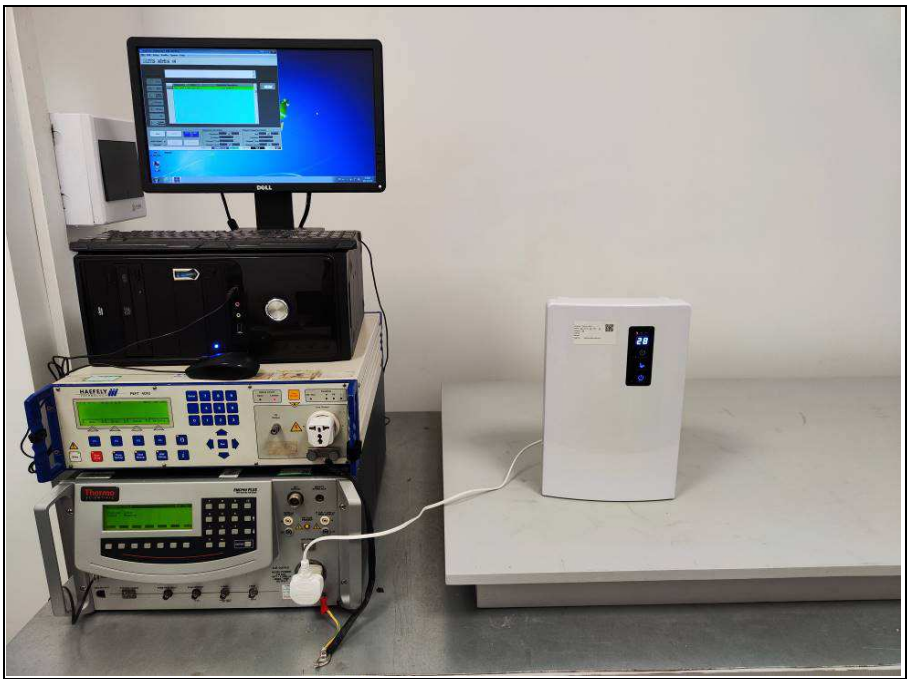
HARMONICS EMISSION TEST &
VOLTAGE FLUCTUATIONS AND FLICKER TEST

ESD TEST

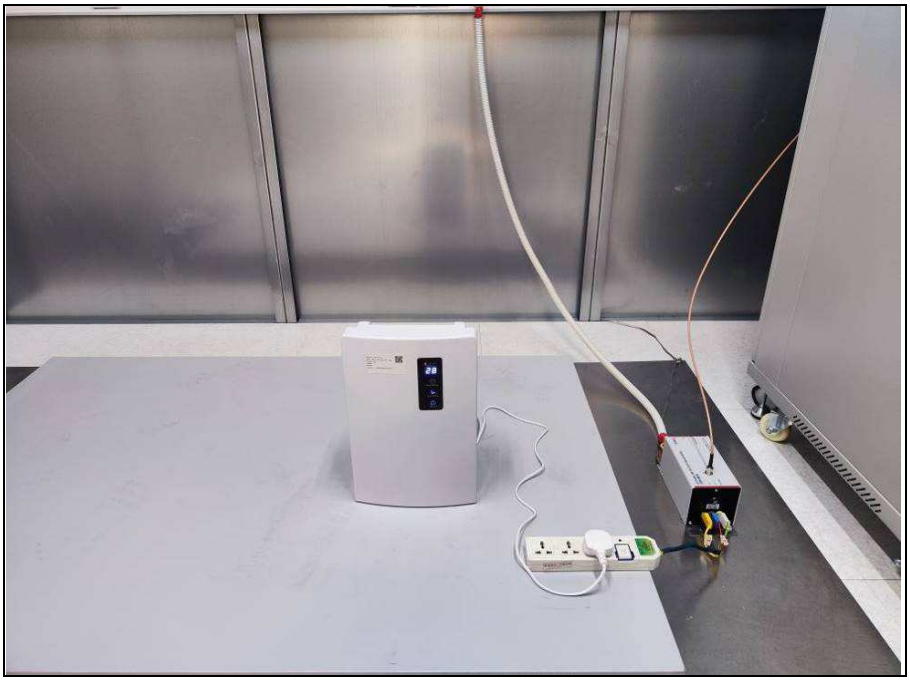
EFT TESTS



SURGE TESTS



CS TEST



VOLTAGE DIPS AND INTERRUPTIONS TEST

5 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No modifications were made to the EUT by the lab during the test.

---END---