4, Songju-ro 236beon-gil, Yangji-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, 17159, Korea
Tel: +82-31-323-6008 Fax: +82-31-323-6010
http://www.ltalab.com

EMC TEST REPORT

Dates of Tests: July 01 - 03, 2020
Test Report S/N: LR500122007G
Test Site : LTA Co., Ltd.

Model No. **HP100**

APPLICANT **KYK Co.,Ltd.**

Equipment name	:	**HYDROGEN WATER GENERATOR**
Manufacturer	:	**KYK Co.,Ltd.**
Model name	:	**HP100**
Test Device Serial No.:	:	**Identical prototype**
Directive	:	**Electromagnetic Compatibility Directive 2014/30/EU**
Rule Part(s)	:	**EN 55014-1:2017**
		EN 55014-2:2015
		EN 61000-3-2:2014
		EN 61000-3-3:2013
Date of issue	:	**July 03, 2020**

This test report is issued under the authority of:

Young Kyu Shin, Technical Manager

The test was supervised by:

Hyun Young Ahn, Test Engineer

This test result only responds to the tested sample. It is not allowed to copy this report even partly without the allowance of the test laboratory. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

NVLAP® TESTING NVLAP LAB CODE 200723-0

Revision history

Revision	Date of issue	Test report No.	Description
0	03.07.2020	LR500122007G	Initial

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1. General information's

1-1 Test Performed

Company name	:	**LTA Co., Ltd.**
Address	:	4, Songju-ro 236beon-gil, Yangji-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, 17159, Korea
Web site	:	http://www.ltalab.com
E-mail	:	chahn@ltalab.com
Telephone	:	+82-31-323-6008
Facsimile		+82-31-323-6010

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which "General requirements for the competent of calibration and testing laboratory".

1-2 Accredited agencies

LTA Co., Ltd. is approved to perform EMC testing by the following agencies:

Agency	Country	Accreditation No.	Validity	Reference
NVLAP	U.S.A	200723-0	2020-09-30	ECT accredited Lab.
RRA	KOREA	KR0049	-	RRA accredited Lab.
	U.S.A		2021-04-11	
	CANADA		2021-06-16	
	VIETNAM		2021-04-12	
VCCI	JAPAN	C-14948	2023-09-10	VCCI registration
		T-12416	2023-09-10	
		R-14483	2023-10-15	
		G-10847	2021-12-13	
KOLAS	KOREA	KT551	2021-08-20	KOLAS accredited Lab.

2. Information's about test item

2-1 Client / Manufacturer

Company name	:	KYK Co.,Ltd.
Address	:	555, Dunchon-daero, Jungwon-gu, Seongnam-si, Gyeonggi-do, Korea
Telephone /Facsimile	:	+82-31-777-3939 / -

Factory

Company name	:	KYK Co.,Ltd.
Address	:	555, Dunchon-daero, Jungwon-gu, Seongnam-si, Gyeonggi-do, Korea

2-2 Equipment Under Test (EUT)

EMS classification	:	Category II
Equipment name	:	HYDROGEN WATER GENERATOR
Model name	:	HP100
Serial number	:	Identification
Date of receipt	:	July 01, 2020
EUT condition	:	Pre-production, not damaged
Interface Ports	:	DC IN
Power rating	:	AC 230 V, 50 Hz

2-3 Speciality

- NONE

2-4 Modification

- NONE

2-5 Test conditions

Temp. / Humid. / Pressure	:	(23 - 25) ℃ / (36 - 54) % R.H. / (100) kPa
Tested Model	:	HP100
Test mode	:	Operating mode
Tested Voltage	:	AC 230 V, 50 Hz

2-6 List of EUT and ACCESSORY

EUT				
Equipment Name	**Model Name**	**Serial No.**	**Manufacturer**	**Remarks**
HYDROGEN WATER GENERATOR	**HP100**	**N/A**	**KYK Co.,Ltd.**	**-**
ACCESSORY				
Equipment Name	**Model Name**	**Serial No.**	**Manufacturer**	**Remarks**
Adapter	EPTA20KWK	N/A	SOLUM VINA COMPANY LIMITED	-

2-7 Cable List

Cable List						
From		**To**		**Length (m)**	**Shielding**	
Type	**I/O Port**	**Type**	**I/O Port**		**Cable**	**backshell**
EUT	DC IN	Adapter	DC OUT	0.8	NO	Plastic
Adapter	AC IN	AC Power Source	2 Pin AC Line	-	-	-

3. Test Report

3.1 Summary of tests

Reference	Parameter	Status (note)
I. Emission		
EN 55014-1:2017		
Conducted Emissions	EN 55014-1:2017	C
Discontinuous Disturbance Voltage	EN 55014-1:2017	C
Disturbance Power	EN 55014-1:2017	NA
Radiated Emissions	EN 55014-1:2017	C
Harmonic Current Emission	EN 61000-3-2:2014	NA Note 3
Voltage Fluctuations and Flicker	EN 61000-3-3:2013	C
II. Immunity		
EN 55014-2:2015		
Electrostatic Discharge	EN 61000-4-2:2009	C
RF Electromagnetic Field (80 MHz to 1 GHz)	EN 61000-4-3:2006/A1:2008/A2:2010	NA
Electrical Fast Transients	EN 61000-4-4:2012	C
Surges	EN 61000-4-5:2014/A1:2017	C
Conducted Disturbances, Induced by Radio-Frequency Fields 0.15 MHz to 80 MHz	EN 61000-4-6:2014/AC:2015	NA
Conducted Disturbances, Induced by Radio-Frequency Fields 0.15 MHz to 230 MHz	EN 61000-4-6:2014/AC:2015	C
Voltage dips and Interruptions	EN 61000-4-11:2004	C

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Note 2: The device operated by AC 230 V.

Note 3: Category II

Category II apparatus shall fulfil the following requirements:

- electrostatic discharge with performance criterion B
- fast transients with performance criterion B
- injected currents up to 230 MHz with performance criterion A
- surges with performance criterion B
- voltage dips and interruptions with performance criterion C

Note 4: The data in this test report are traceable to the national or international standards.

Note 5: - We did not test EN61000-3-2 (Harmonic Current Emission) for the HP100 because equipment whose rated power is less or equal 75W don't need to be tested.

3.2 EMISSION

3.2.1 Conducted Emissions

Definition:

The test assesses the ability of the EUT to limit its internal noise from being present on the AC mains Power In/Output ports.

We were performed the test according to LTA procedure LTA-QI-04.

Test method	:	EN 55014-1:2017
Measurement Frequency range	:	150 kHz – 30 MHz
Measurement RBW	:	9 kHz
Test mode	:	Operating mode
Result	:	**Complies**

Measurement Data:

A sample calculation:

COR. F (correction factor)= LISN Insertion loss + Cable loss + Pulse Limits Factor

Emission Level= meter reading + COR.F

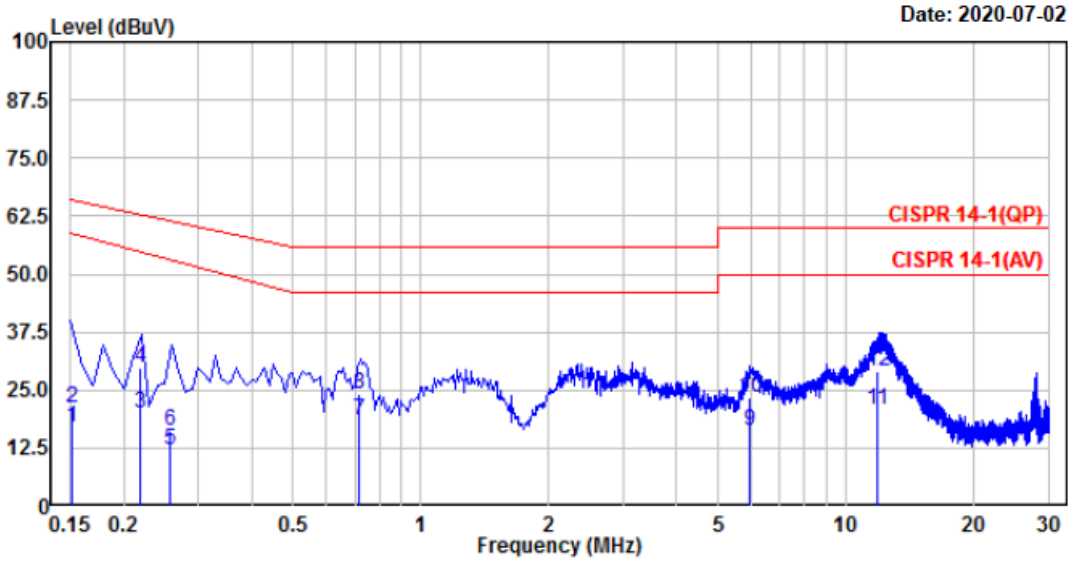
Limits

Frequency Range	At mains terminals		At load terminals and additional terminals	
	Quasi-peak	Average	Quasi-peak	Average
(0.15 – 0.05) MHz	(66 − 56) dBµV	(59 − 46) dBµV	80 dBµV	70 dBµV
(0.05 – 5) MHz	56 dBµV	46 dBµV	74 dBµV	64 dBµV
(5 – 30) MHz	60 dBµV	50 dBµV	74 dBµV	64 dBµV

Conducted Emissions (LINE)

4, Songjuro 236 Beon-gil, Yangji-myeon
Cheoin-gu, Youngin-si, Gyeonggi-do
449-822 Korea
Tel:+82-31-3236008,9
Fax:+82-31-3236010

EUT /Model No.	: HP100	Phase	: NEUTRAL
Test Mode	: Operating mode	Test Power	: 230 V / 50 Hz
Temp./ Humi.	: 24 'C / 54 % R.H.	Test Engineer	: AHN H Y



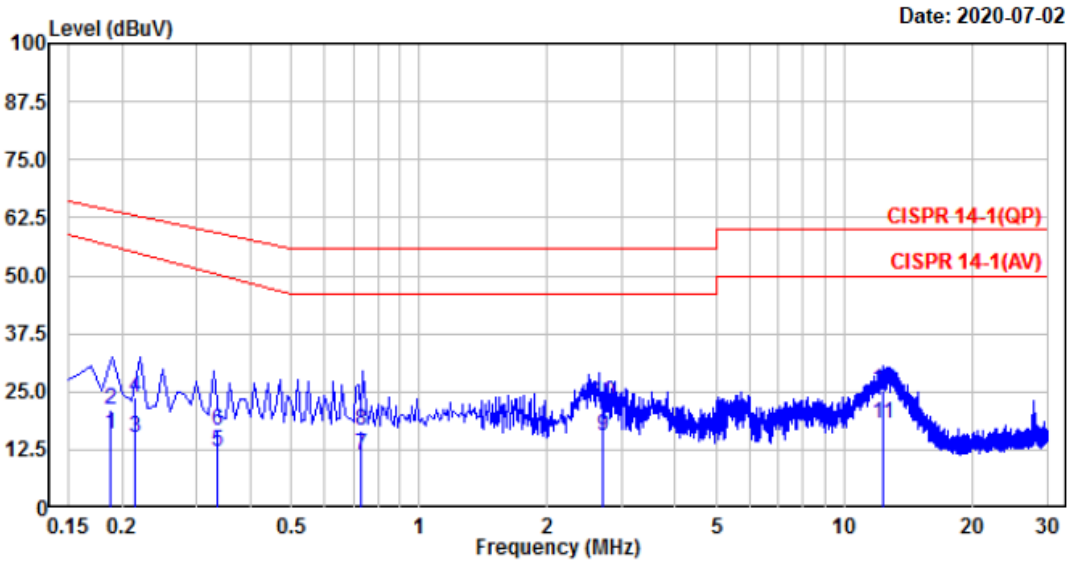
No.	Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Phase
	MHz	dBµV	dBµV	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	
2.	0.151	1.64	-2.50	19.57	21.21	17.07	65.93	58.91	44.72	41.84	Line
4.	0.219	10.37	0.54	19.57	29.94	20.11	62.86	54.91	32.92	34.80	Line
6.	0.257	-3.28	-7.59	19.57	16.29	11.98	61.54	53.20	45.25	41.22	Line
8.	0.717	4.55	-1.19	19.60	24.15	18.41	56.00	46.00	31.85	27.59	Line
10.	5.939	3.50	-3.74	19.96	23.46	16.22	60.00	50.00	36.54	33.78	Line
12.	11.848	8.80	0.41	20.38	29.18	20.79	60.00	50.00	30.82	29.21	Line

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

Conducted Emissions (NEUTRAL)

4, Songjuro 236 Beon-gil, Yangji-myeon
Cheoin-gu, Youngin-si, Gyeonggi-do
449-822 Korea
Tel:+82-31-3236008,9
Fax:+82-31-3236010

EUT /Model No.	: HP100	Phase	: NEUTRAL
Test Mode	: Operating mode	Test Power	: 230 V / 50 Hz
Temp./ Humi.	: 24 'C / 54 % R.H.	Test Engineer	: AHN H Y



No.	Freq MHz	RD QP dBµV	RD AV dBµV	C.F dB	Result QP dBµV	Result AV dBµV	Limit QP dBµV	Limit AV dBµV	Margin QP dB	Margin AV dB	Phase
2.	0.188	1.64	-3.73	19.63	21.27	15.90	64.13	56.57	42.86	40.67	neutral
4.	0.215	4.28	-4.71	19.63	23.91	14.92	63.00	55.10	39.09	40.18	neutral
6.	0.336	-3.05	-7.69	19.65	16.60	11.96	59.29	50.28	42.69	38.32	neutral
8.	0.731	-2.91	-8.30	19.67	16.76	11.37	56.00	46.00	39.24	34.63	neutral
10.	2.694	2.96	-4.32	19.81	22.77	15.49	56.00	46.00	33.23	30.51	neutral
12.	12.290	4.81	-2.24	20.34	25.15	18.10	60.00	50.00	34.85	31.90	neutral

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

3.2.2 Discontinuous Disturbance Voltage

Definition:

Switching operations in thermostatically controlled appliances, automatic program controlled machines and other electrically controlled or operated appliances generate discontinuous disturbance.

We were performed the test according to LTA procedure LTA-QI-04.

Test method	:	EN 55014-1:2017
Measurement Frequency range	:	150 kHz – 30 MHz
Observed Time	:	120 min for each measurement
Test mode	:	Operating mode
Result	:	**Complies**

Measurement Data:

- Refer to the Next page

Discontinuous Disturbance Voltage (LINE)

CL55 TEST REPORT

TEST PASS

2/7/2020 14:37:52

Title	KYK Co.,Ltd.	Time Test	02:00:02.28
Required	EN 55014-1	Executed by	AHN H Y
Description	23°C, 49%RH		
Model	HP100		
Type	Operating mode	SN	N/A
Report			

Mode	Click Rate		
Type of Eut	Electro-mechanical office machines		
Rx 150 KHz Att. [dB]	10	Rx 500 kHz Att. [dB]	5
Rx 1.4 MHz Att. [dB]	5	Rx 30 MHz Att. [dB]	10
Rx 150 kHz Input Offset [dB]	10.29	Rx 500 kHz Input Offset [dB]	10.35
Rx 1.4 MHz Input Offset [dB]	10.39	Rx 30 MHz Input Offset [dB]	10.76
External Att. [dB]	NONE		
Remote	LISN LT32 – LINE 1		

	150 kHz	500 kHz	1.4 MHz	30 MHz
First Run				
Short	0	0	0	0
Long	0	0	0	0
Fast Long	0	0	0	0
Total Clicks	0	0	0	0
Events	0	0	0	0
Time(s)	0.00	0.00	0.00	0.00
Sw.Op.	0	0	0	0
4.2.3.4 events	0	0	0	0
Limit dBuV	66	56	56	60
N	0.00	0.00	0.00	0.00
	PASS	PASS	PASS	PASS

150 kHz	No Clicks	500 kHz	No Clicks
1.4 MHz	No Clicks	30 MHz	No Clicks

New Limit [dBuV]
Allowed Clicks

SECOND PASS NOT ALLOWED

Short
Long
Total Clicks
Events
Time(s)
4.2.3.4 events

Discontinuous Disturbance Voltage (NEUTRAL)

CL55 TEST REPORT

TEST PASS

2/7/2020 16:40:12

Title	**KYK Co.,Ltd.**	Time Test	**02:00:01.45**
Required	**EN 55014-1**	Executed by	**AHN H Y**
Description	**23℃, 49%RH**		
Model	**HP100**		
Type	**Operating mode**	SN	**N/A**
Report			

Mode	**Click Rate**		
Type of Eut	**Electro-mechanical office machines**		
Rx 150 KHz Att. [dB]	**10**	Rx 500 kHz Att. [dB]	**5**
Rx 1.4 MHz Att. [dB]	**5**	Rx 30 MHz Att. [dB]	**10**
Rx 150 kHz Input Offset [dB]	**10.29**	Rx 500 kHz Input Offset [dB]	**10.35**
Rx 1.4 MHz Input Offset [dB]	**10.39**	Rx 30 MHz Input Offset [dB]	**10.76**
External Att. [dB]	**NONE**		
Remote	**LISN LT32 - NEUTRAL**		

	150 kHz	500 kHz	1.4 MHz	30 MHz
First Run				
Short	0	0	0	0
Long	0	0	0	0
Fast Long	0	0	0	0
Total Clicks	0	0	0	0
Events	0	0	0	0
Time(s)	0.00	0.00	0.00	0.00
Sw.Op.	0	0	0	0
4.2.3.4 events	0	0	0	0
Limit dBuV	66	56	56	60
N	0.00	0.00	0.00	0.00
	PASS	**PASS**	**PASS**	**PASS**

150 kHz	No Clicks	500 kHz	No Clicks
1.4 MHz	No Clicks	30 MHz	No Clicks

New Limit [dBuV]
Allowed Clicks

SECOND PASS NOT ALLOWED

Short
Long
Total Clicks
Events
Time(s)
4.2.3.4 events

3.2.3 Radiated Emissions

Definition:

The test assesses the ability of ancillary equipment to limit their internal noise from being radiated from the enclosure.

We were performed the test according to LTA procedure LTA-QI-04.

Test method	:	EN 55014-1:2017
Measuring Distance	:	10 m
Measurement Frequency range	:	30 MHz – 1 000 MHz
Measurement RBW	:	120 kHz
Test mode	:	Operating mode
Result	:	**Complies**

Measurement Data:

- Refer to the Next page

A sample calculation:

COR. F (correction factor)= Antenna factor + Cable loss- Amp.gain- Distance correction

Emission Level= meter reading + COR.F

Limit of 10 m below 1 GHz

Frequency Range	Quasi-peak
(30 – 230) MHz	30 dBµV/m
(230 – 1 000) MHz	37 dBµV/m

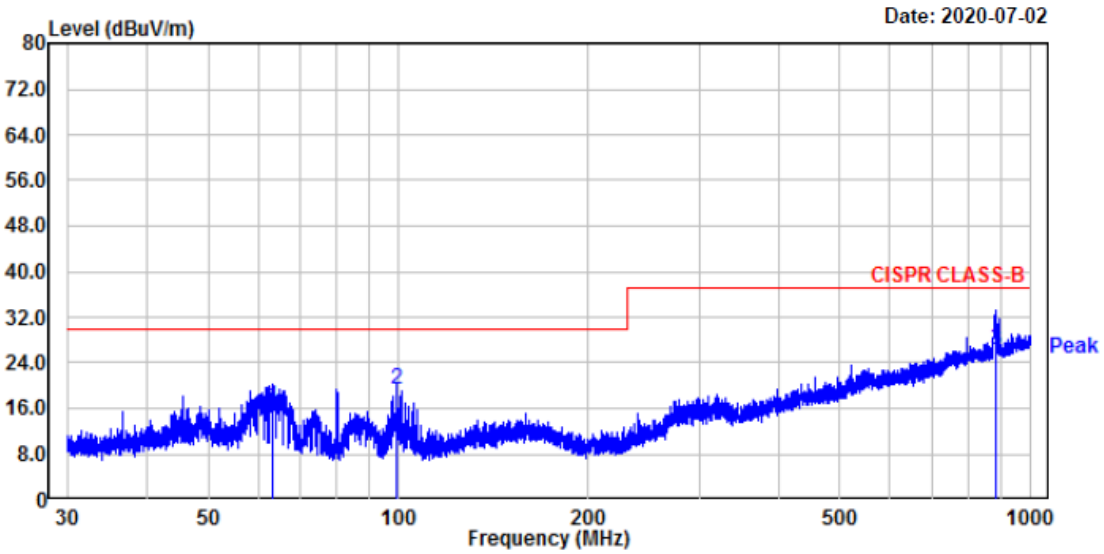
Radiated Emissions / V

4, Songjuro 236Beon-gil, yanggi-myeon,
Yongin-si, Gyeonggi-do, Korea
Tel : +82-31-3236008,9
Fax : +82-31-3236010
www.ltalab.com

EUT/Model No.: HP100 Temp/Humi: 23 'C / 48 % R.H.

Test Mode : Operating mode Tested by: AHN H Y

Power : 230 V / 50 Hz



No.	Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
	MHz	dBµV	dB	dBµV/m	dBµV/m	dB	cm	deg	
1.	63.20	30.49	-14.19	16.30	30.00	13.70	400	12	vertical
2.	99.44	36.79	-17.46	19.33	30.00	10.67	100	173	vertical
3.	882.57	25.90	0.42	26.32	37.00	10.68	130	313	vertical

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

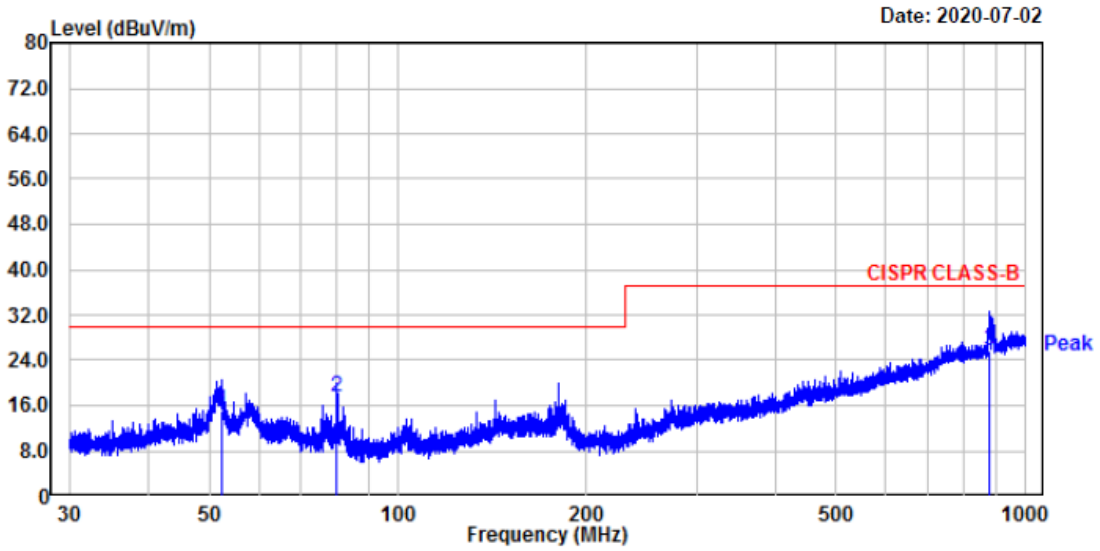
Radiated Emissions / H

4, Songjuro 236Beon-gil, yanggi-myeon,
Yongin-si, Gyeonggi-do, Korea
Tel : +82-31-3236008,9
Fax : +82-31-3236010
www.ltalab.com

EUT/Model No.: HP100 Temp/Humi: 23 'C / 48 % R.H.

Test Mode : Operating mode Tested by: AHN H Y

Power : 230 V / 50 Hz



No.	Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
	MHz	dBµV	dB	dBµV/m	dBµV/m	dB	cm	deg	
1.	52.25	28.50	-13.27	15.23	30.00	14.77	100	58	horizontal
2.	80.01	34.79	-17.30	17.49	30.00	12.51	400	230	horizontal
3.	877.17	25.40	0.39	25.79	37.00	11.21	250	360	horizontal

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

3.2.4 Harmonic Current Emission

Definition:

This part deals with the Limitation of harmonic currents injected into the public supply system.

We were performed the test according to LTA procedure LTA-QI-04.

Test method	:	EN 61000-3-2:2014
Test mode	:	Operating mode
Rated power	:	3.381 W
Result	:	**Not Applicable**

Measurement Data:

- We did not test EN61000-3-2 (Harmonic Current Emission) for the HP100 because equipment whose rated power is less or equal 75 W don’t need to be tested.

Harmonic Current Emission

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IEC61000-3-2:2014
Fluctuating Harmonics

Instrument Details	
Instrument Model	PPA5511
Serial Number	162-04957
Firmware Version	2.179
N4L Calibration Date	18th September 2017
Instrument Version	Standard
Test Settings	
Class	Class A
Mode	Measured
Equipment Under Test	
Brand	KYK Co.,Ltd.
Model	HP100
Serial	N/A
Impedance Network ID	N/A

Test Conditions	User Entered	Measured
Rated Voltage	N/A	230.895V
Rated Current	N/A	40.021mA
Rated Frequency	N/A	50.000Hz
Rated Power	N/A	3.381W

Additional Test Information	
Measured Power Factor	0.3673
Max Current THD	0.00%
Average THC	45.368mA
Max Power	4.180W
Max F.Current	18.562mA
Average F.Current	14.679mA
Minimum Current	100A
Test Duration	2.5 minutes
Additional Test Details	
Operator	N/A
Lab Name	N/A
Location	N/A
Notes	
Signature	

Results	**Test - N/A. Rated Power < 75W**

Test not applicable

With the exception of lighting equipment section 7 of the IEC61000-3-2:2014 standard declares that no Harmonic current limits are specified for equipment with a rated power of 75W or less.

3.2.5 Voltage Fluctuations and Flicker

Definition:

This section is concerned with the limitation of Voltage Fluctuations and Flicker impressed on the public low-voltage system.

We were performed the test according to LTA procedure LTA-QI-04.

Test method	:	EN 61000-3-3:2013
Test mode	:	Operating mode
Result	:	**Complies**

Measurement Data:

- Refer to the Next page (Maximum emission configuration)

Voltage Fluctuations and Flicker

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IEC61000-3-3:2013 Ed.3.0
Flickermeter

Instrument Details	
Instrument Model	PPA5511
Serial Number	162-04957
Firmware Version	2.179
N4L Calibration Date	18th September 2017
Instrument Version	Standard

Test Settings	
Class	Voltage
Mode	Normal (4.0%)
Minimum Current	10A
PST	10 minutes
PLT	12 PSTs

Equipment Under Test	
Brand	KYK Co.,Ltd.
Model	HP100
Serial	N/A
Impedance Network ID	N/A

Test Conditions	User Entered	Measured
Rated Voltage	N/A	230.896V
Rated Current	N/A	N/A
Rated Frequency	N/A	50.000Hz
Rated Power	N/A	N/A
D max	0.1381% (Limit: 4.0%)	
T max	0.0000 s (Limit: 0.5 s)	
DC max	0.0010% (Limit: 3.3%)	

Additional Test Details	
Operator	N/A
Lab Name	N/A
Location	N/A
Notes	
Signature	

Results	Phase1: PASS

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IEC61000-3-3:2013 Ed.3.0 Flickermeter

Instrument Details

Instrument Model	PPA5511
Instrument Serial	162-04957
Instrument Firmware	2.179

Equipment Under Test

Brand	KYK Co.,Ltd.
Model	HP100
Serial	N/A

Flicker Test Results

PST no.	Status	DC (%)	Dmax (%)	Tmax (s)	PST	PST Lim	PLT	PLT Lim
1	Phase1: PASS	0.00105	0.08047	0.00000	0.08226	1.00000	N/A	N/A
2	Phase1: PASS	0.00105	0.08047	0.00000	0.08226	1.00000	N/A	N/A
3	Phase1: PASS	0.00105	0.08047	0.00000	0.08226	1.00000	N/A	N/A
4	Phase1: PASS	0.00105	0.08047	0.00000	0.08226	1.00000	N/A	N/A
5	Phase1: PASS	0.00105	0.08047	0.00000	0.08226	1.00000	N/A	N/A
6	Phase1: PASS	0.00105	0.08047	0.00000	0.08226	1.00000	N/A	N/A
7	Phase1: PASS	0.00105	0.08047	0.00000	0.08226	1.00000	N/A	N/A
8	Phase1: PASS	0.00105	0.08047	0.00000	0.08226	1.00000	N/A	N/A
9	Phase1: PASS	0.00105	0.08047	0.00000	0.08226	1.00000	N/A	N/A
10	Phase1: PASS	0.00105	0.08047	0.00000	0.08226	1.00000	N/A	N/A
11	Phase1: PASS	0.00105	0.13809	0.00000	0.08226	1.00000	N/A	N/A
12	Phase1: PASS	0.00105	0.13809	0.00000	0.08226	1.00000	N/A	N/A

3.3 IMMUNITY

3.3.1 Electrostatic Discharge

Definition:

The test assesses the ability of the EUT to operate as intended in the event of an electrostatic discharge.

We were performed the test according to LTA procedure LTA-QI-04.

Test date	:	2020. 07. 01.
Test method	:	EN 61000-4-2:2009
Temperature / Humidity / Pressure	:	24 ℃ / 39 % R.H. / 100 kPa
Discharge Impedance	:	(330 ± 10 %) Ω / (150 ± 10 %) pF
Type of Discharge (air discharge)	:	± 8 kV
Type of Discharge (contact discharge)	:	± 4 kV
Number of discharges at each point	:	10 of each polarity
Discharge Repetition on Rate	:	1 / sec
Test mode	:	Operating mode
Performance Criteria	:	B (Refer to the appendix B)
Result	:	**Complies**

- Classification of EUT is Category II

Measurement Data:

ESD Test Point and Result

1. Indirect Discharge

No.	Position	Kind of Discharge	Results	Remarks
1	HCP	Contact	Complies (A)	No reaction recognized
2	VCP	Contact	Complies (A)	No reaction recognized

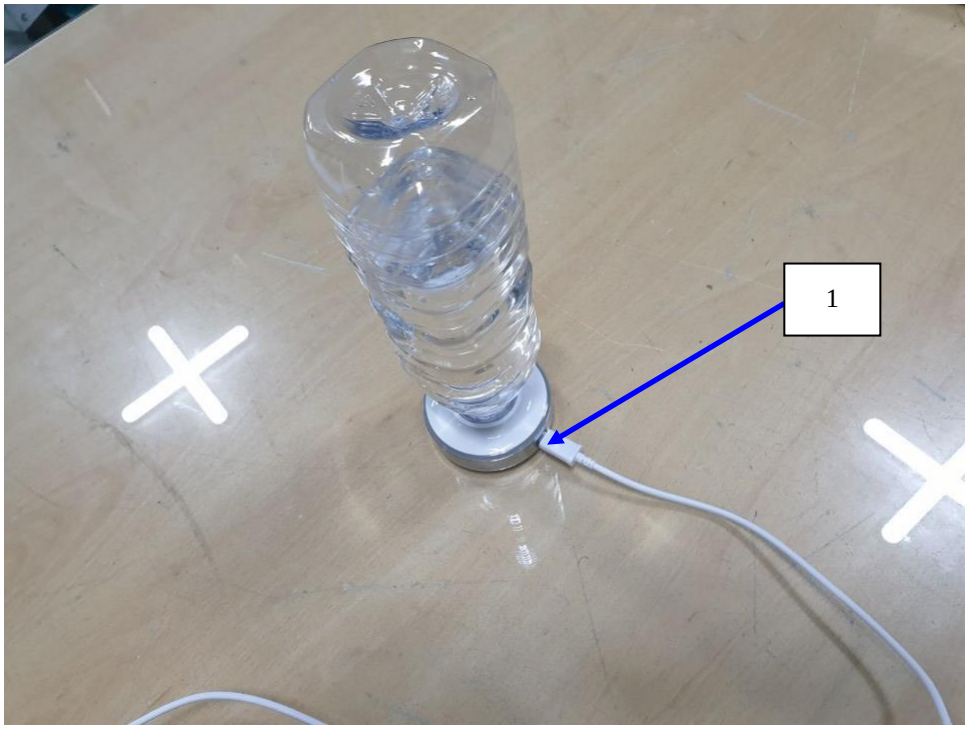
2. Direct Discharge

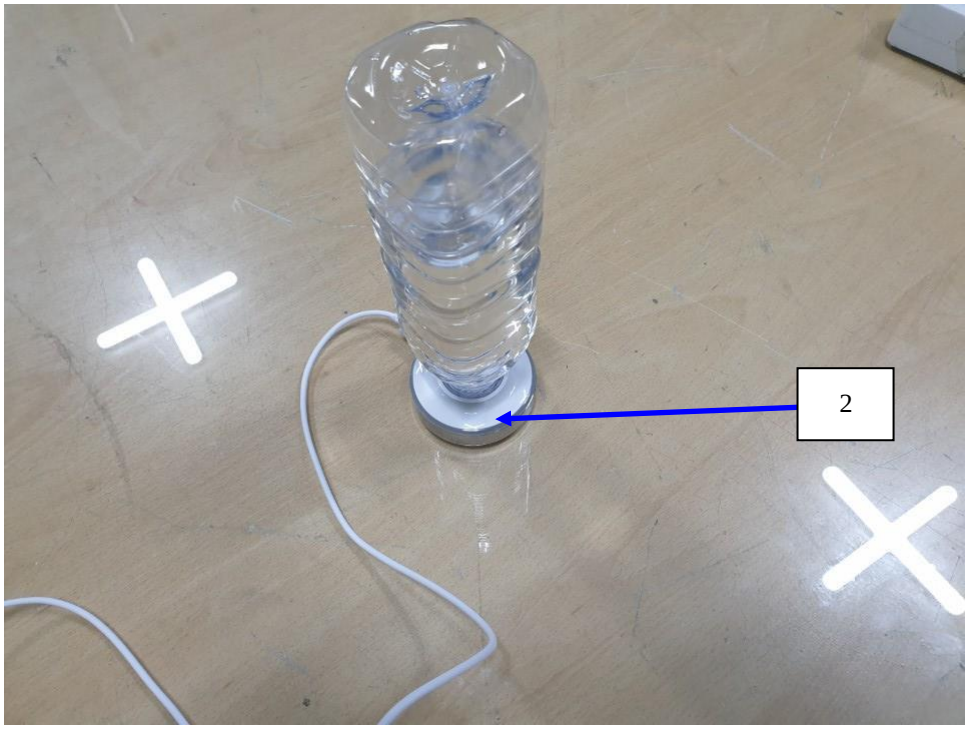
No.	Position	Kind of Discharge	Result	Remarks
1	Enclosure	Air	Complies (A)	No reaction recognized
2	DC IN	Air	Complies (A)	No reaction recognized

ESD TEST POINT

[Air discharge]

[Contact discharge]





3.3.2 Electrical Fast Transients

Definition:

The test assesses the ability of the EUT to operate as intended in the event of fast transients presence on one of the input/output ports.

We were performed the test according to LTA procedure LTA-QI-04.

Test date	:	2020. 07. 03.
Test method	:	EN 61000-4-4:2012
Temperature / Humidity / Pressure	:	24 ℃ / 36 % R.H. / 100 kPa
Cable length	:	< 3 m
Test level	:	1.0 kV (AC power input port)
Polarity	:	Negative/ positive
Repetition frequency	:	5 ㎑
Test mode	:	Operating mode
Performance Criteria	:	B (Refer to the appendix B)
Result	:	**Complies**

- Classification of EUT is Category II

Measurement Data:

Power Line	Test level	Result	Remarks
L – N	±1.0 kV	Complies (A)	No reaction recognized

3.3.3 Surges

Definition:

The test assesses the ability of the EUT to operate as intended in the event of surge presence on the AC main power input ports.

We were performed the test according to LTA procedure LTA-QI-04.

Test date	:	2020. 07. 03.
Test method	:	EN 61000-4-5 :2014
Temperature / Humidity / Pressure	:	24 ℃ / 36 % R.H. / 100 kPa
Test level	:	1.0 kV (line to line), 2.0 kV (line to ground)
Polarity	:	Negative/ positive
Wave shape	:	1.2/ 50 μs pulse
Number of surges	:	5 (at each phase)
Test mode	:	Operating mode
Performance Criteria	:	B (Refer to the appendix B)
Result	:	**Complies**

- Classification of EUT is Category II

Measurement Data:

Phase	Line	level	Result	Remark
90°	Line(L) to line(N)	+1.0 kV	Complies (A)	No reaction recognized
270°	Line(L) to line(N)	-1.0 kV	Complies (A)	No reaction recognized

3.3.4 Conducted Disturbances, Induced by Radio-Frequency Fields

Definition:

The test assesses the ability of the EUT to operate as intended in the presence of a radio frequency electromagnetic disturbance on the input/output ports.

We were performed the test according to LTA procedure LTA-QI-04.

Test date	:	2020. 07. 03.
Test method	:	EN 61000-4-6:2014/AC:2015
Temperature / Humidity / Pressure	:	25 ℃ / 37 % R.H. / 100 kPa
Frequency range	:	0.15 ㎒ – 230 ㎒
Test level	:	3 Vrms unmodulated
Amplitude Modulation	:	AM, 80 %, 1 ㎑ Audio signal
Step size	:	1 % of fundamental.
Test mode	:	Operating mode
Performance Criteria	:	A (Refer to the appendix B)
Result	:	**Complies**

- Classification of EUT is Category II

Measurement Data:

Port	Result	Remarks
Power	Complies (A)	No reaction recognized

3.3.5 Voltage dips and Interruptions

Definition:

The test assesses the ability of the EUT to operate as intended in the event of voltage dips and interruptions present on the AC mains power input ports.

We were performed the test according to LTA procedure LTA-QI-04.

Test date	:	2020. 07. 03.
Test method	:	EN 61000-4-11:2004
Temperature / Humidity / Pressure	:	24 ℃ / 36 % R.H. / 100 kPa
Voltage droop	:	40 % for duration of 10 period
		70 % for duration of 25 period
Voltage Interruption	:	0 % for duration of 0.5 period
Ut	:	230 Vac
Test mode	:	Operating mode
Performance Criteria	:	A, C (Refer to the appendix B)
Result	:	**Complies**

- Classification of EUT is Category II

Measurement Data:

Test Level %Ut	Voltage droop and interruptions %Ut	Duration of Reduction (period)	Result	Remarks
0	100	0.5	Complies (A)	No reaction recognized
40	60	10	Complies (A)	No reaction recognized
70	30	25	Complies (B)	EUT was turned off during the test. Re-operation without user's control. After the test, EUT was normally operated.

APPENDIX A

TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment are identified by the Test Laboratory.

Conducted Emissions

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	EMI TEST Receiver	ESR	Rohde & Schwarz	101499	2020.07.04	1 year
☒	Pulse Limiter	ESH3-Z2	Rohde & Schwarz	100710	2021.03.16	1 year
☐	LISN	ESH3-Z6	Rohde & Schwarz	100378	2020.09.05	1 year
☐	LISN	ESH3-Z6	Rohde & Schwarz	101468	2020.09.05	1 year
☒	LISN(main)	ENV216	Rohde & Schwarz	101222	2020.09.06	1 year
☐	LISN(sub)	LT32C/10	AFJ	32031518210	2020.09.05	1 year
☒	TEST PROGRAM	e3_ce 20181212a (V9)	AUDIX	-	-	-

Discontinuous Disturbance Voltage

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Click Meter	CL55C	AFJ	55041225172	2021.03.16	1 year
☒	LISN	LT32C/10	AFJ	32031518210	2020.09.05	1 year
☒	TEST PROGRAM	CMS_Ver:2.3	AFJ	-	-	-

Radiated Emissions

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	EMI TEST Receiver	ESU	Rohde & Schwarz	100092	2020.09.05	1 year
☒	Amplifier (25 dB)	8447D	HP	2944A07684	2021.03.16	1 year
☒	BILOG Antenna	VULB 9168	SCHWARZBECK	775	2021.03.26 (KOLAS)	2 year
☐	BILOG Antenna	VULB 9168	SCHWARZBECK	775	2021.11.12 (RRA)	2 year
☒	TEST PROGRAM	e3 20181212a (V9)	AUDIX	-	-	-

Harmonic Current Emission / Voltage Fluctuations and Flicker

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Precision Power Analyzer	PPA5511	Newtons4th Ltd	162-04957	2020.09.16	1 year
☒	Reference Impedance Network	ES4152	NF Corp.	9074424	2020.09.09	1 year

Electrostatic Discharge

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	ESD Simulator	ESS-2000	NOISEKEN	8000C03241	2020.09.09	1 year
☒	ESD GUN	TC-815R	NOISEKEN	ESS0382069	2020.09.09	1 year

Electrical Fast Transients

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Compact Generator	Compact NX	EMTEST	P1725200196	2020.10.31	1 year
☒	AC Power Source	Variac NX	EMTEST	P1745207276	2020.10.31	1 year
☐	Capacitive Coupling Clamp	CCI	EMTEST	P1744207071	2020.10.31	1 year

Surges

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Compact Generator	Compact NX	EMTEST	P1725200196	2020.10.31	1 year
☒	AC Power Source	Variac NX	EMTEST	P1745207276	2020.10.31	1 year
☐	CDN	CNV 508T5	EMTEST	P1742204978	2020.10.31	1 year
☐	CDN	CNV 508N1	EMTEST	P1742204940	2020.10.31	1 year

Conducted Disturbances, Induced by Radio-Frequency Fields

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Signal generator	SML03	R&S	103026/0013	2021.03.16	1 year
☒	POWER METER	NRVD	R&S	101689	2021.03.16	1 year
☒	POWER Sensor	URV5-Z2	R&S	100755	2021.03.16	1 year
☒	POWER Sensor	URV5-Z2	R&S	100756	2021.03.16	1 year
☒	RF Power Amplifier	FLL75A	FRANKONIA	1033	-	-
☐	EM INJECTION CLAMP	TSIC-23	F.C.C	529	2021.03.17	1 year
☐	CDN (M1)	TSCDN-M1-16A	F.C.C	07004	2020.09.06	1 year
☒	CDN (M2)	TSCDN-M2-16A	F.C.C	07008	2020.09.06	1 year
☐	CDN (M2)	TSCDN-M2-16A	F.C.C	07009	2021.03.16	1 year
☐	CDN (M3)	TSCDN-M3-16A	F.C.C	07016	2021.03.16	1 year
☐	CDN (M3)	TSCDN-M3-16A	F.C.C	07017	2020.09.06	1 year

Voltage dips and Interruptions

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Compact Generator	Compact NX	EMTEST	P1725200196	2020.10.31	1 year
☒	AC Power Source	Variac NX	EMTEST	P1745207276	2020.10.31	1 year

APPENDIX B

PERFORMANCE CRITERIA

A functional description and a definition of performance criteria, during or as a consequence of the EMC testing, shall be provided by the manufacturer and noted in the test report, based on the following criteria.

Performance 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 SEK Svensk Elstandard Downloaded by [se-fre_wennersten] [2016-02-17]
For SEK internal use only Copyright SEK Svensk Elstandard 2016 – 18 – CISPR 14-2:2015 © IEC 2015 description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

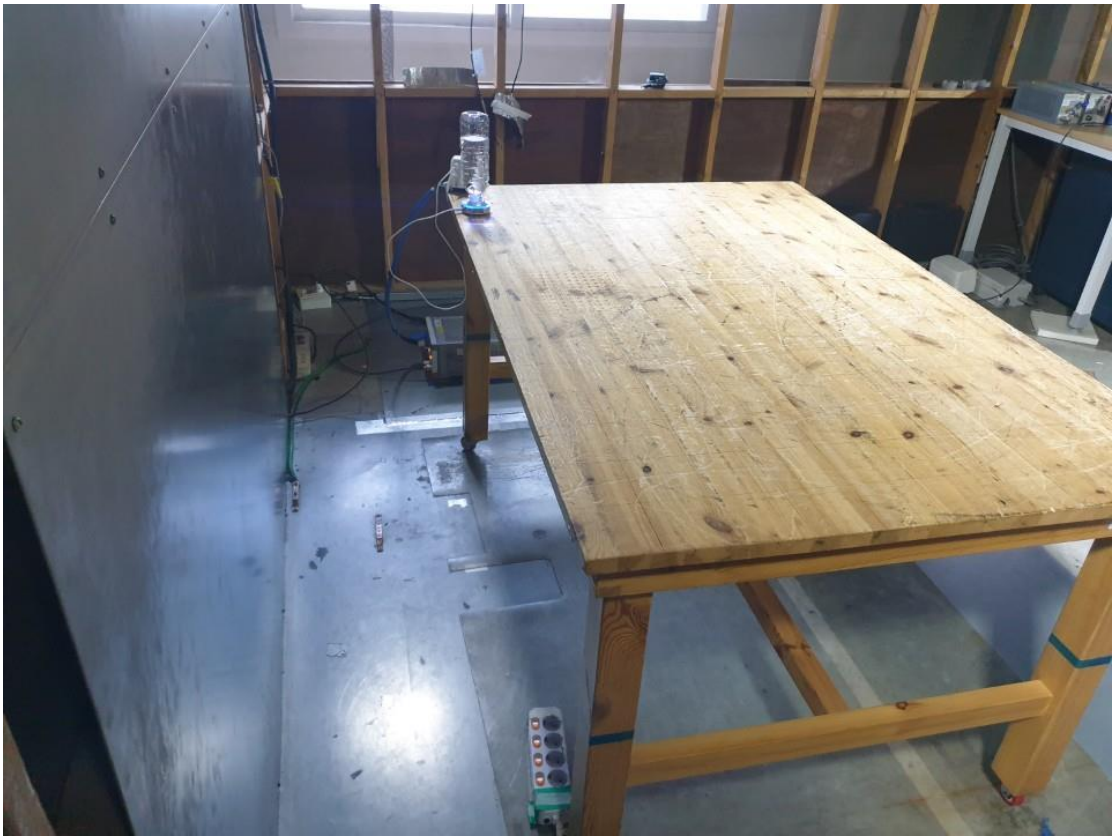
Performance criterion B: The apparatus shall continue to operate as intended after the test.
No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however no change of actual operating state or stored data is allowed to persist after the test. 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.

Performance criterion C: Temporary loss of function is allowed, provided the function is selfrecoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use. The selection, the specification of functions, and the permissible degradation is left to the responsibility of the manufacturer. Annex A serves as a guide to formulate the permissible degradation of the equipment under test (EUT) caused by electromagnetic phenomena.

APPENDIX C

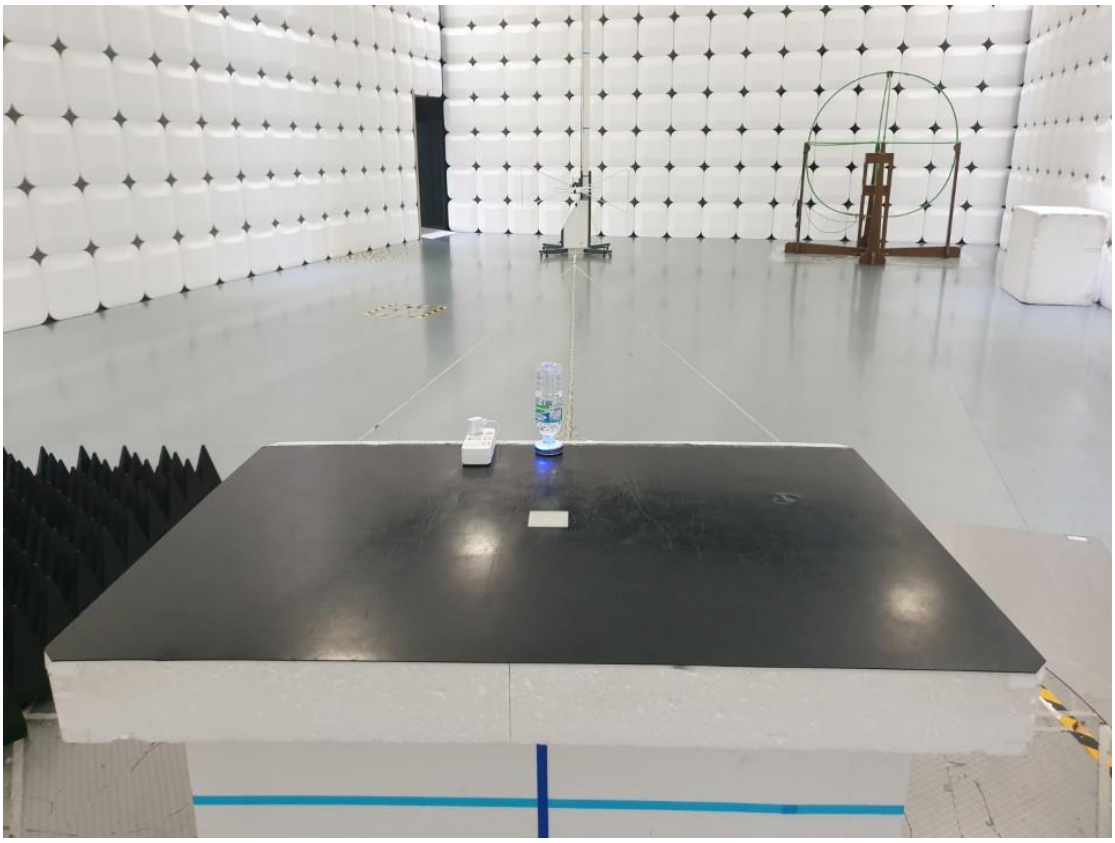
PHOTOGRAPHS

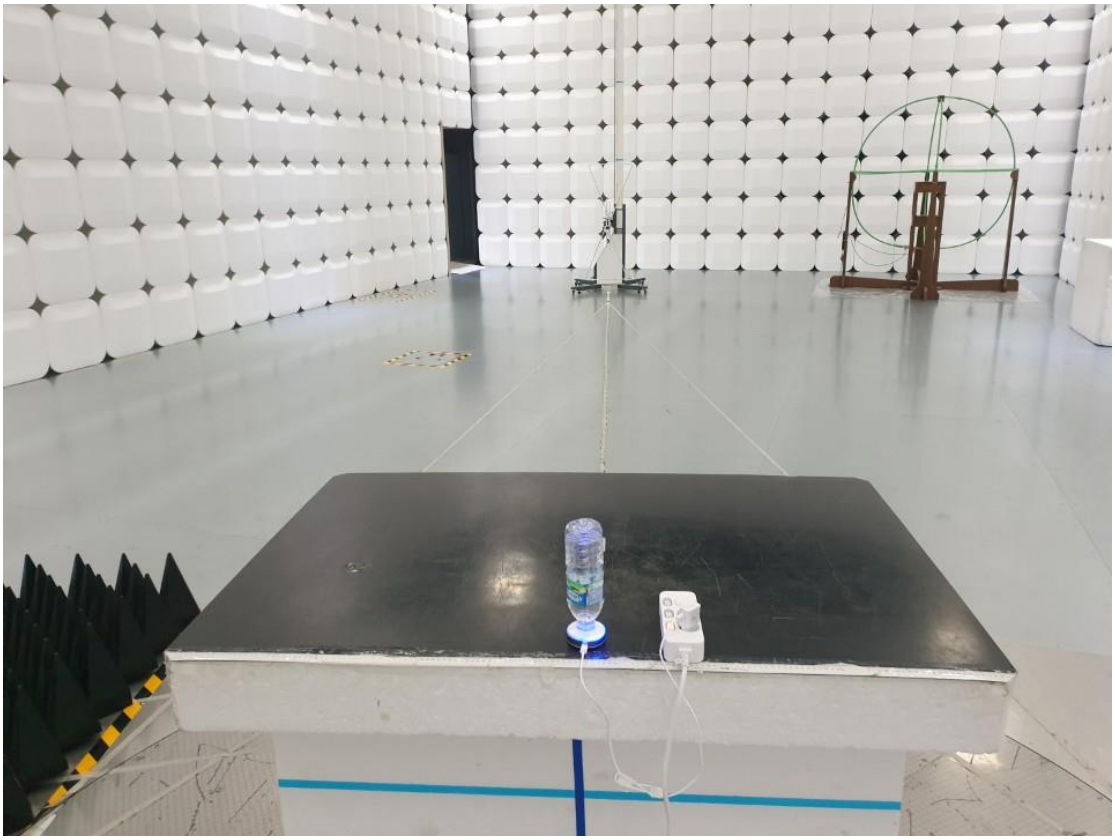
Conducted Emissions



Discontinuous Disturbance Voltage

Radiated Emissions





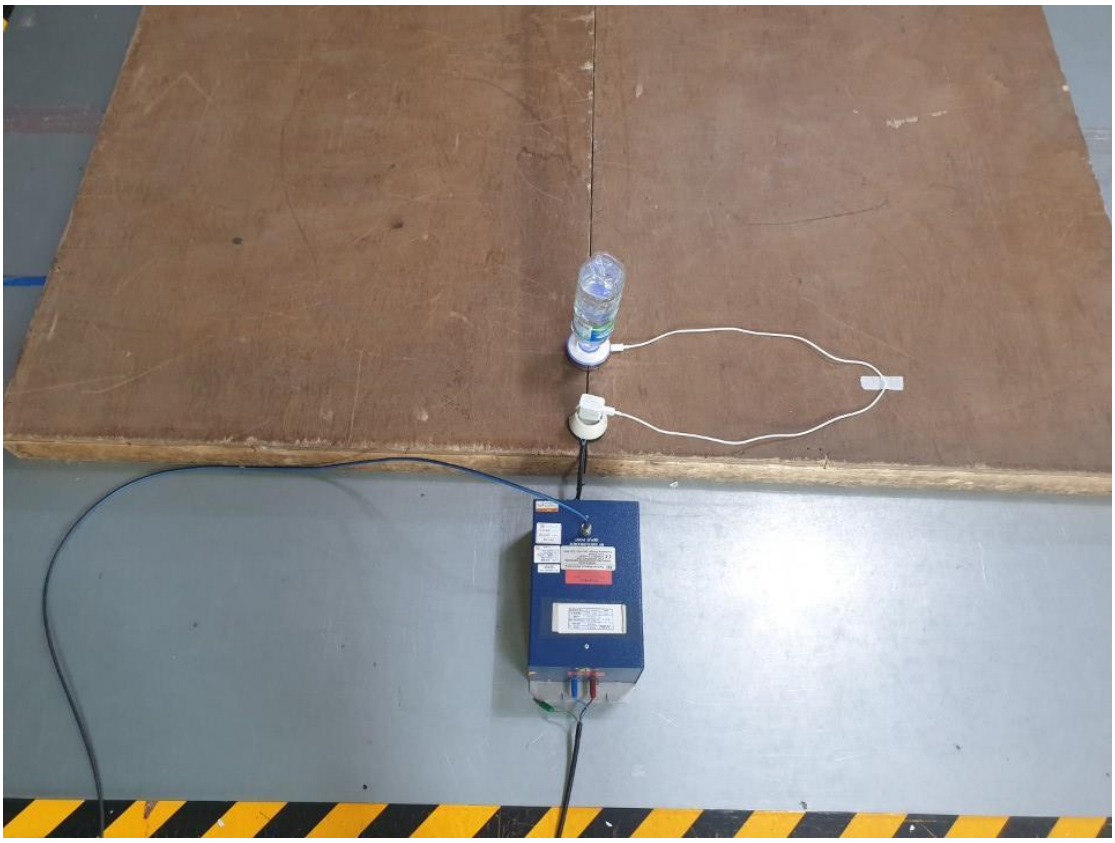
Harmonic Current Emission / Voltage Fluctuations and Flicker

Electrostatic Discharge

Electrical Fast Transients

Surges

Conducted Disturbances, Induced by Radio-Frequency Fields



Voltage dips and Interruptions

EUT


·제품명:포켓용 수소수생성기
·모델명:HP100
·전원전력:DC5V/0.5A/2.5W
·제조사:KYK김영귀환원수(주)
·제조국:한국
경기도 성남시 중원구
둔촌대로555,407호
R-R-K72-HP100
·고객센터:1588-9938

EUT