EMC TECHNICAL FILE

Product Name : 4 Wheeler Explorer

Model Name : 1013-1, 1013-2

Prepared for:

KFN ApS
Bondesvadvej 15 DK 8300 Odder
TEL: +45 86 14 22 65
FAX: +45 20 23 22 65

Prepared by:

Shanghai Global Testing Services Co., Ltd.
Floor 2nd, Building D-1, No. 128, Shenfu Road, Minhang District, Shanghai, China.
TEL: +86-21-33637866
FAX: +86-21-33637858

File Number	:	TEJS20022421800
Date of File	:	February 24, 2020 to February 27, 2020
Date of Issue	:	February 27, 2020

Notes：

The review results only relate to these samples which have been reviewed.

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Applicant:	KFN ApS Bondesvadvej 15 DK 8300 Odder
Manufacturer:	KFN ApS Bondesvadvej 15 DK 8300 Odder
Product Name:	Outdoor high voltage vacuum circuit breaker
Brand Name:	enoedo
Model Name:	1013-1, 1013-2
Serial Number:	N/A
Power:	36V
Date of Receipt:	February 24, 2020
Date of Review:	February 24, 2020 to February 27, 2020
Review Standard:	EN 60601-1-2:2015
Review Result:	PASS

Prepared by :

GLOBAL TESTING SERVICES CO., LTD. GTS CERTIFICATION

Test Summary

ELECTROMAGNETIC INTERFERENCE (EMI)

Test	Test Requirement	Test Method	Class / Severity	Result
Conducted Emission (150K to 30MHz)	EN 60601-1-2:2015	CISPR 11:2003/A1:2004/ A2:2006	Group 1, Class B	PASS
Radiated Electromagnetic Disturbance 30MHz to 1000MHz	EN 60601-1-2:2015	CISPR 11:2003/A1:2004/ A2:2006	Group 1, Class B	PASS
Harmonic Emission on AC, 50Hz to 2kHz	EN 60601-1-2:2015	EN 61000-3-2:2014	Clause 7 of IEC61000-3-2	PASS
Flicker Emission on AC	EN 60601-1-2:2015	EN 61000-3-3:2013	Clause 5 of IEC61000-3-3	PASS

Electromagnetic Susceptibility(EMS)

Test	Test Requirement	Test Method	Class / Severity	Result
ESD	EN 60601-1-2:2015	EN 61000-4-2:2009	Contact Air 6 kV 8 kV	PASS
Radiated Immunity	EN 60601-1-2:2015	EN 61000-4-3:2006/A2:2010	80%, 3V/m 1kHz , AM	PASS
Electrical Fast Transients (EFT) on AC	EN 60601-1-2:2015	EN 61000-4-4:2012	AC 2.0kV	PASS
Surge Immunity on AC	EN 60601-1-2:2015	EN 61000-4-5:2006	1kV D.M.† 2kV C.M.†	PASS
Injected Currents on AC	EN 60601-1-2:2015	EN 61000-4-6:2014	3Vrms (emf), 80%, 1kHz Amp. Mod.	PASS
Power-frequency magnetic field	EN 60601-1-2:2015	EN 61000-4-8:2010	50/60Hz,3A/m	PASS
Voltage Dips and Interruptions on AC	EN 60601-1-2:2015	EN 61000-4-11:2004	<5 % UT for 0,5 cycle 40 % UT for 5 cycles; 70 % UT for 25 cycles; <5 % UT for 5 s	PASS

Remark:

* U_T is the nominal supply voltage.
† D.M. – Differential Mode.
C.M -- Common Mode.

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Annex

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5 General Information

5.1 Client Information

Applicant:	KFN ApS
Address of Applicant:	Bondesvadvej 15 DK 8300 Odder
Manufacturer:	KFN ApS
Address of Manufacturer:	Bondesvadvej 15 DK 8300 Odder
Factory:	Same as Manufacturer
Address of Factory:	Same as Manufacturer

5.2 General Description of E.U.T.

EUT Name:	4 Wheeler Explorer
Model No.:	1013-1, 1013-2
Serial No.:	Not supplied by the client

5.3 Details of E.U.T.

Power Supply:	AC36V

5.4 Description of Support Units

Name / Function	Model No.	Remark
N/A	N/A	N/A

The EUT has been tested as an independent unit.

5.5 Deviation from Standards

None

5.6 Abnormalities from Standard Conditions

None.

5.7 Monitoring of EUT for All Immunity Test

Audio: N/A
Visual: Lighting

5.8 Test Location

All tests were performed at:
Shanghai Global Testing Services Co., Ltd

Table 1 : Tests Carried Out Under EN 60601-1-2:2015

Standard		Status
CISPR 11:2003/A1:2004/A2:2006	Radiated Electromagnetic Disturbance	√
CISPR 11:2003/A1:2004/A2:2006	Conducted Emissions on AC	√
EN 61000-3-2:2014	Harmonic Emissions on AC	√
EN 61000-3-3:2013	Flicker Emissions on AC	√
EN 61000-4-2: 2009	Electrostatic discharge immunity test	√
EN 61000-4-3: 2006/A2:2010	Radiated, radio-frequency electromagnetic field electromagnetic field immunity test	√
EN 61000-4-4:2012	Electrical fast transients/burst immunity test	√
EN 61000-4-5: 2014/A1:2017	Surge immunity test	√
EN 61000-4-6: 2014/AC:2015	Immunity to conducted disturbances, induced by radio-frequency fields	√
EN 61000-4-8: 2010	Power-frequency magnetic field immunity test	√
EN 61000-4-11: 2004/ A1:2017	Voltage dips, short interruptions and voltage variations immunity tests	√

x Indicates that the test is not applicable
√ Indicates that the test is applicable

6 Equipment Used during Test

Conducted Emission

No	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Due Date (yyyy-mm-dd)	Calibration Interval
1	EMI test receiver Line impedance	Rohde & Schwarz	ESCS30	100086	2020-12-29	1Y
2	stabilization network	ETS	3816/2	00034161	2020-12-29	1Y

Radiated Emission

No	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Due Date (yyyy-mm-dd)	Calibration Interval
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2020-12-29	1Y
2	ANTENNA	SCHWARZBECK	VULB9168	9168-313	2020-12-29	1Y
3	TURNTABLE	INNCO	DS 2000S-1T	/	/	/

Harmonic &Flicker

No	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Due Date (yyyy-mm-dd)	Calibration Interval
1	Single phase harmonics&flicker analyzer	EM test	DPA500	V050710012 5	2020-12-29	1Y
2	AC SOURCE 6KVA	EM test	ACS500	V050710012 6	2020-12-29	1Y

Electrostatic Discharge

No	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Due Date (yyyy-mm-dd)	Calibration Interval
1	Electrostatic Discharge Simulator	KIKUSUI	KES4021	LL004261	2020-12-29	1Y

Radio Frequency Electromagnetic Fields Test

No	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Due Date (yyyy-mm-dd)	Calibration Interval
1	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2020-12-29	1Y
2	amplifier	AR	30W1000B	0327284	-	-
3	amplifier	AR	30S1G3	0324978 -	-	-
4	power meter	Rohde & Schwarz	NRP	101641	2020-12-29	1Y
5	Single generator	Rohde & Schwarz	SMR40	100555	2020-12-29	1Y

EFT Test

No	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Due Date (yyyy-mm-dd)	Calibration Interval
1	Ultra-compact simulator	EM test	UCS500M4	V0507100 122	2020-12-29	1Y

Surge Test

No	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Due Date (yyyy-mm-dd)	Calibration Interval
1	Ultra-compact simulator	EM test	UCS500M4	V0507100 122	2020-12-29	1Y

Injected Currents test

No	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Due Date (yyyy-mm-dd)	Calibration Interval
1	AM/FM signal generator	AEROFLEX	2023A 2	02306/528	2020-12-29	1Y
2	PAMP Conducted RF test system	HAEFFLY	PAMP	250 151708	2020-12-29	1Y
3	CDN impedance and K-factor	LUTHI	L-801 M2/M3	2117	/	/

Voltage dips and interruopotion test

No	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Due Date (yyyy-mm-dd)	Calibration Interval
1	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2020-12-29	1Y
2	amplifier	AR	30W1000B	0327284	-	
3	amplifier	AR	30S1G3	0324978	-	
4	power meter	Rohde & Schwarz	NRP	10164	2020-12-29	1Y
5	Single generator	Rohde & Schwarz	SMR40	100555	2020-12-29	1Y

Power-frequency magnetic field

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Due Date (yyyy-mm-dd)	Calibration Interval
1	Current transformer for magnetic field	EM test	MC2630	/	2020-12-29	1Y
2	Current transformer for magnetic field	EM test	MC26100	/	2020-12-29	1Y
3	magnetic field coil	EM test	MS100	/	2020-12-29	1Y

General used equipment

No	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Due Date (yyyy-mm-dd)	Calibration Interval
1	Atmosphere meter pressure	Shanghai ZhongXuan Electronic Co;Ltd	BY-2003P	/	2020-12-29	1Y
2	Digital Multimeter	FLUKE	17B	10560713	2020-12-29	1Y
3	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2020-12-29	1Y
4	Digital meter illuminance	TES electrical electronic Corp.	TES-1330A	050602219	2020-12-29	1Y

6 Emission Test Results

6.1 Conducted Emissions on AC mains port

Test Requirement:	EN 60601-1-2:2015
Test Method:	CISPR 11:2003/A1:2004/A2:2006
Test Date:	February 24, 2020 to February 27, 2020
Frequency Range:	150KHz to 30MHz
Class / Severity:	0.15 MHz – 0.5 MHz: 66 dB(μV) – 56 dB(μV) quasi-peak 56 dB(μV) – 46 dB(μV) average 0.5 MHz – 5 MHz: 56 dB(μV) quasi-peak 46 dB(μV) average 5 MHz – 30 MHz: 60 dB(μV) quasi-peak 50 dB(μV) average Note: The limits decrease linearly with the logarithm of the frequency in the range 0,15 MHz to 0,5 MHz.
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth for 0.15-30MHz) Quasi-Peak if maximised peak within 6dB of Quasi-Peak limit
Result:	PASS

6.1.1 E.U.T. Operation

Operating Environment:

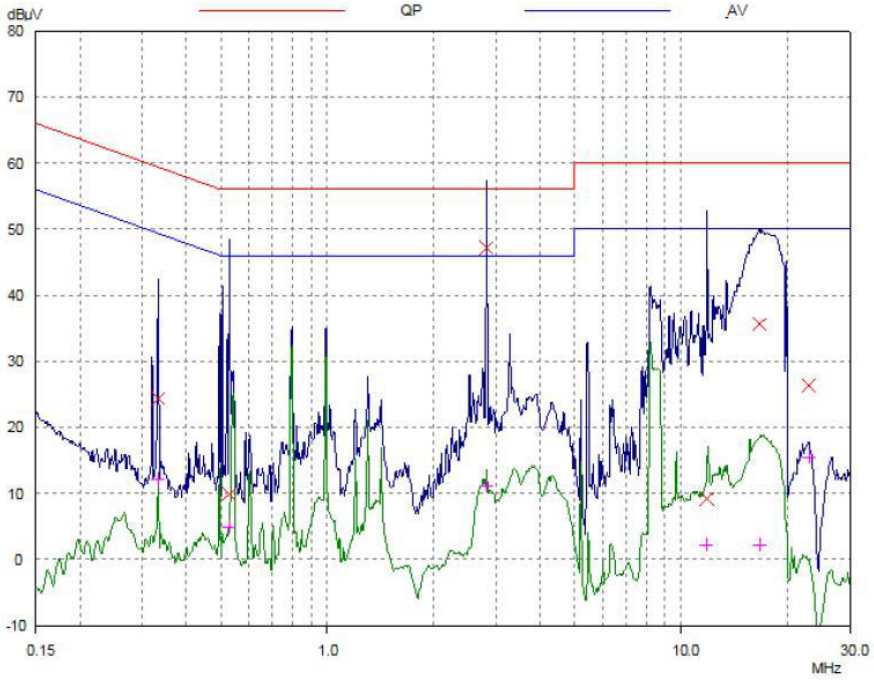
Temperature: 24 °C Humidity: 49% RH Atmospheric Pressure: 1006 mbar

EUT Operation: The EUT is working normally.

6.1.2 Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies where maximized peak emission were detected

L Line:

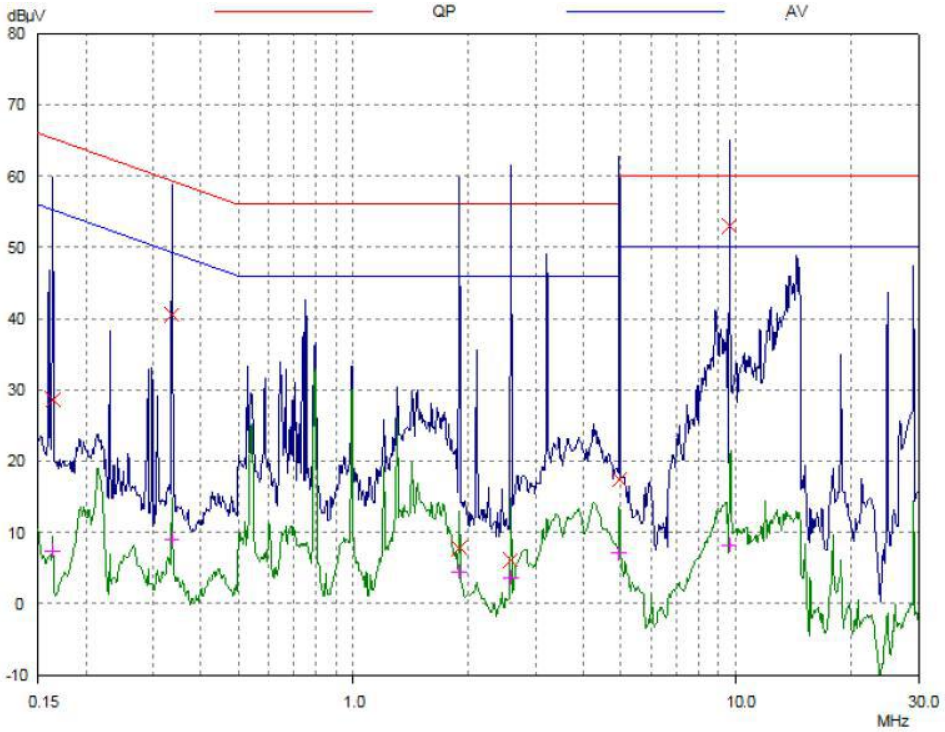


Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB
0.33277	24.35	59.38	35.03
0.52826	9.88	56.00	46.12
2.81557	47.14	56.00	8.86
11.81579	9.17	60.00	50.83
16.6443	35.65	60.00	24.35
22.89217	26.29	60.00	33.71

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
0.33277	12.03	49.38	37.35
0.52826	4.84	46.00	41.16
2.81557	11.08	46.00	34.92
11.81579	2.15	50.00	47.85
16.6443	2.15	50.00	47.85
22.89217	15.50	50.00	34.50

N line:



Final Meausre Reustls

Frequency	QP Level	QP Limit	QP Delta
MHz	dB µV	dB µV	dB
0,16374	28,63	65,26	36,64
0,33543	40,49	59,32	18,83
1,89034	7,81	56,00	48,19
2,57929	6,13	56,00	49,87
4,95752	17,40	56,00	38,60
9,60481	53,01	60,00	6,99

Frequency	AV Level	AV Limit	AV Delta
MHz	dBµV	dBµV	dB
0.16374	7.39	55.27	47.88
0.33543	9.02	49.32	40.30
1.89034	4.42	46.00	41.58
2.57929	3.55	46.00	42.45
4.95752	7.10	46.00	38.90
9.60481	8.11	50.00	41.89

6.2 Radiated Emission

Test Requirement:	EN 60601-1-2:2015
Test Method:	CISPR 11:2003/A1:2004/A2:2006
Test Date	February 24, 2020 to February 27, 2020
Frequency Range:	30MHz to 1GHz
Measurement Distance:	3m
Class:	Class B / Group 1 ISM equipment
Limit:	40.0 dBµV/m between 30MHz & 230MHz 47.0 dBµV/m between 230MHz & 1GHz
Detector:	Peak for pre-scan (120kHz resolution bandwidth) Quasi-Peak if maximised peak within 6dB of limit
Result:	PASS

6.2.1 E.U.T. Operation

Operating Environment:

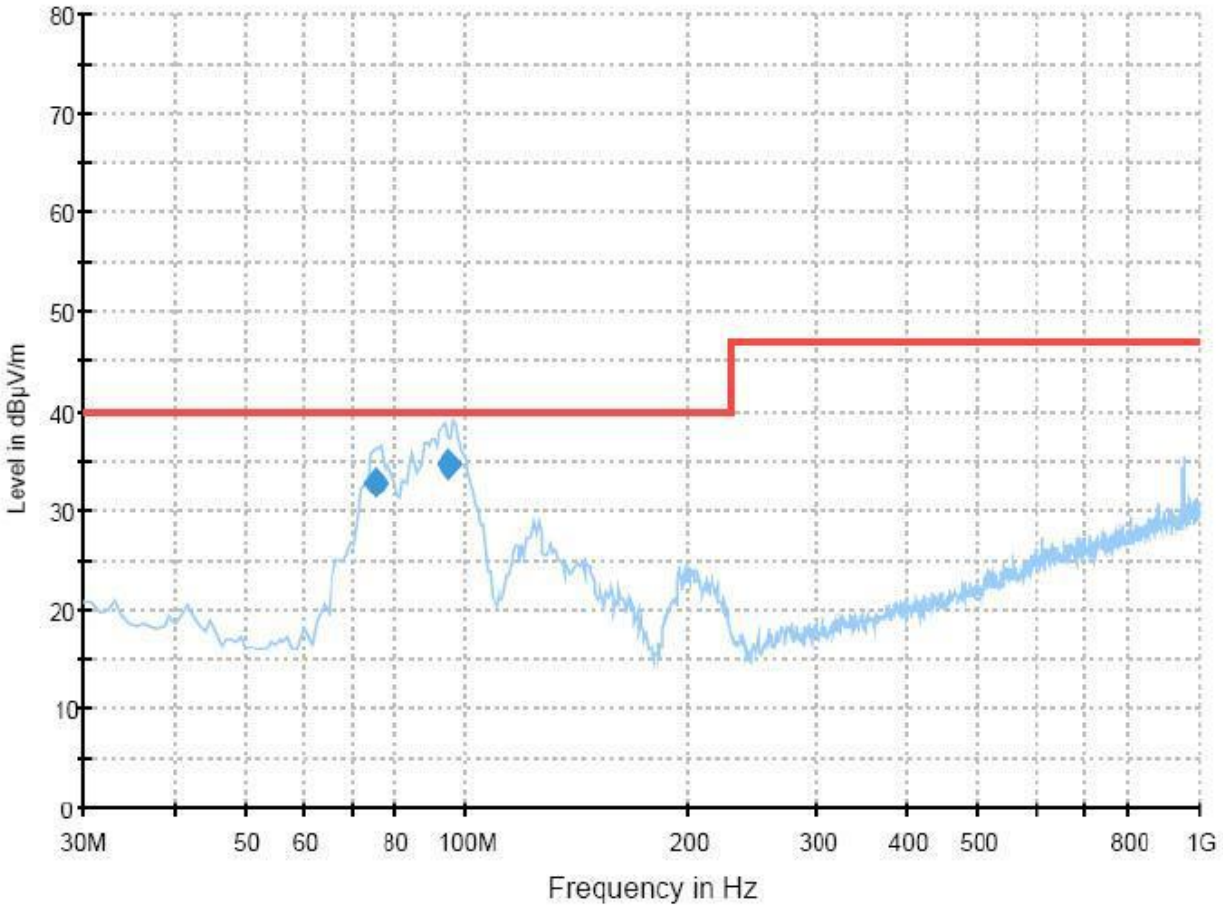
Temperature: 24 °C Humidity: 48% RH Atmospheric Pressure: 1004 mbar

EUT Operation: The EUT is working normally.

6.2.2 Measurement Data

An initial pre-scan was performed in peak detection mode. Quasi-Peak was performed at the frequencies with maximized peak emission were detected.

Horizontal



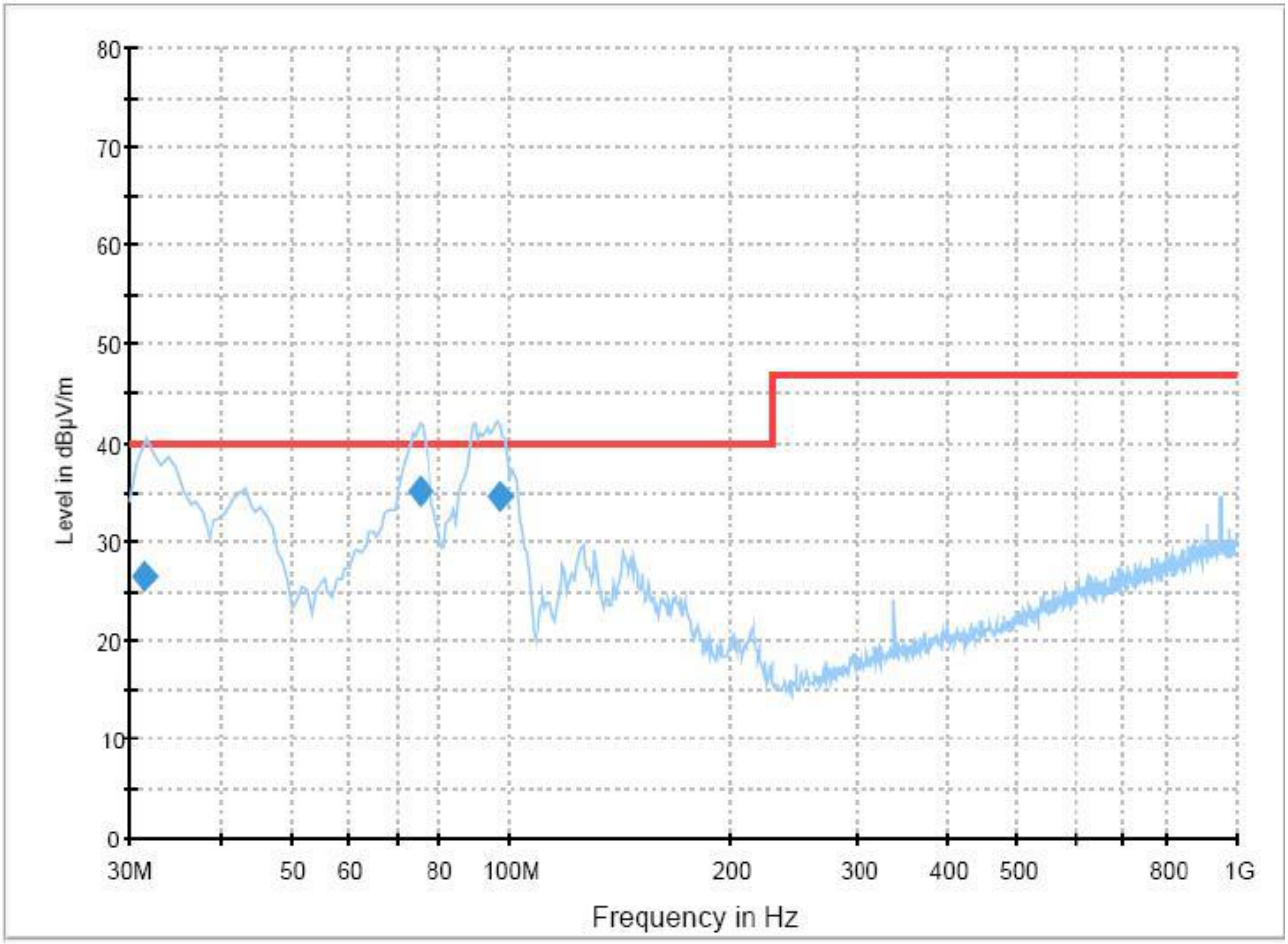
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)
75.451520	32.8	1000.000	120.000	250.0	H	338.0	-12.6	7.20
94.240640	34.6	1000.000	120.000	196.0	H	306.0	-12.8	5.40

(Continuation of the “Final Result 1” table from colum 9..)

Frequency (MHz)	Limit (dBµV/m)	Comment
75.451520	40.00	
94.240640	40.00	

Vertifical



Final Result 1

Frequency	QuasiPeak	Meas. Time (ms)	Bandwidth (kHz)	Antenna height	Polarity	Turntable position (deg)	Corr.(db)	Margin (db)
31,45885	26,5	1000,00	12,000	100,0	V	324,0	9,7	13,50
75,316160	35,1	1000,00	12,000	100,0	V	214,0	-12,6	4,90
96,803840	34,5	1000,00	12,000	121,0	V	124,0	-12,6	5,50

(Continuation of the “Final Resut 1” table from colum 9..)

Frequency (MHz)	Limit (dBµV/m)	Comment
31.415885	40.00	
75.316160	40.00	
96.803840	40.00	

6.3 Harmonics Test Results

Test Requirement: EN 60601-1-2:2015
Test Method: EN 61000-3-2:2014
Frequency Range: Up to 2kHz
Test Date February 24, 2020 to February 27, 2020
Test Class: Class A
Result: PASS

Hn	Ieff [A]	Ieff [%]	Limit [A]	Result
1	331.567E-3	100.000		
2	11.600E-3	3.499	1.08	PASS
3	196.941E-3	59.397	2.30	PASS
4	9.907E-3	2.988	430.00E-3	PASS
5	61.740E-3	18.621	1.14	PASS
6	5.759E-3	1.737	300.00E-3	PASS
7	35.648E-3	10.751	770.00E-3	PASS
8	3.227E-3	0.973	230.00E-3	PASS
9	23.175E-3	6.990	400.00E-3	PASS
10	2.426E-3	0.732	184.00E-3	PASS
11	12.005E-3	3.621	330.00E-3	PASS
12	2.322E-3	0.700	153.33E-3	PASS
13	8.841E-3	2.666	210.00E-3	PASS
14	2.074E-3	0.626	131.43E-3	PASS
15	6.376E-3	1.923	150.00E-3	PASS
16	1.876E-3	0.566	115.00E-3	PASS
17	5.699E-3	1.719	132.35E-3	PASS
18	1.727E-3	0.521	102.22E-3	PASS
19	4.245E-3	1.280	118.42E-3	PASS
20	1.437E-3	0.433	92.00E-3	PASS
21	3.362E-3	1.014	160.71E-3	PASS
22	1.483E-3	0.447	83.64E-3	PASS
23	2.851E-3	0.860	146.74E-3	PASS
24	1.350E-3	0.407	76.66E-3	PASS
25	2.421E-3	0.730	135.00E-3	PASS
26	1.289E-3	0.389	70.77E-3	PASS
27	2.565E-3	0.774	124.99E-3	PASS
28	1.114E-3	0.336	65.71E-3	PASS
29	1.949E-3	0.588	116.39E-3	PASS
30	1.159E-3	0.350	61.33E-3	PASS
31	1.710E-3	0.516	108.87E-3	PASS
32	1.315E-3	0.397	57.50E-3	PASS
33	1.830E-3	0.552	102.27E-3	PASS
34	1.178E-3	0.355	54.12E-3	PASS
35	1.525E-3	0.460	96.44E-3	PASS
36	1.218E-3	0.367	51.11E-3	PASS
37	1.594E-3	0.481	91.21E-3	PASS
38	1.058E-3	0.319	48.42E-3	PASS
39	1.219E-3	0.368	86.53E-3	PASS
40	1.119E-3	0.337	46.00E-3	PASS

Maximum harmonic current results

Hn	Ieff [A]	Ieff [%]	Limit [A]	Result
Hn	Ieff [A]	Ieff [%]	Limit [A]	Result
1	527.694E-3	100.000		
2	25.051E-3	4.747	1.62	PASS
3	308.125E-3	58.391	3.45	PASS
4	20.672E-3	3.917	645.00E-3	PASS
5	76.783E-3	14.551	1.71	PASS
6	13.665E-3	2.590	450.00E-3	PASS
7	46.495E-3	8.811	1.15	PASS
8	6.951E-3	1.317	345.00E-3	PASS
9	28.367E-3	5.376	600.00E-3	PASS
10	4.352E-3	0.825	276.00E-3	PASS
11	17.997E-3	3.411	495.00E-3	PASS
12	4.524E-3	0.857	229.99E-3	PASS
13	13.227E-3	2.507	315.00E-3	PASS
14	3.874E-3	0.734	197.15E-3	PASS
15	9.295E-3	1.761	225.00E-3	PASS
16	3.537E-3	0.670	172.50E-3	PASS
17	7.373E-3	1.397	198.52E-3	PASS
18	2.440E-3	0.462	153.33E-3	PASS
19	4.911E-3	0.931	177.63E-3	PASS
20	2.369E-3	0.449	138.00E-3	PASS
21	4.863E-3	0.922	160.71E-3	PASS
22	2.544E-3	0.482	125.46E-3	PASS
23	3.704E-3	0.702	146.74E-3	PASS
24	2.582E-3	0.489	114.99E-3	PASS
25	3.460E-3	0.656	135.00E-3	PASS
26	2.376E-3	0.450	106.16E-3	PASS
27	3.224E-3	0.611	124.99E-3	PASS
28	1.686E-3	0.319	98.57E-3	PASS
29	2.631E-3	0.499	116.39E-3	PASS
30	1.941E-3	0.368	92.00E-3	PASS
31	2.473E-3	0.469	108.87E-3	PASS
32	2.345E-3	0.444	86.25E-3	PASS
33	2.646E-3	0.501	102.27E-3	PASS
34	2.234E-3	0.423	81.18E-3	PASS
35	2.384E-3	0.452	96.44E-3	PASS
36	1.980E-3	0.375	76.66E-3	PASS
37	2.047E-3	0.388	91.21E-3	PASS
38	1.783E-3	0.338	72.63E-3	PASS
39	1.961E-3	0.372	86.53E-3	PASS
40	2.060E-3	0.390	69.00E-3	PASS

6.4 Flicker Test Result

Test Requirement: EN 60601-1-2:2015
Test Method: EN 61000-3-3: 2013
Test Date: February 24, 2020 to February 27, 2020

Class/Severity: Clause 5 of EN 61000-3-3
Measurement Time: 2h
Detector: As per EN 61000-3-3
Result: PASS

Maxiimum Flliicker resulltts

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.013	0.65	PASS
dc [%]	0.004	3.30	PASS
dmax [%]	0.218	4.00	PASS
dt [s]	0.000	0.50	PASS

7 Immunity Test Results

7.1 Performance Criteria Description in Clause 6.2.1.10 of EN 60601-1-2

Performance Criterion	Under the test conditions specified in H6.2, the ME EQUIPMENT or ME SYSTEM shall be able to provide the BASIC SAFETY and ESSENTIAL PERFORMANCE. The following DEGRADATIONS, if associated with BASIC SAFETY and ESSENTIAL PERFORMANCE, shall not be allowed: – component failures; – changes in programmable parameters; – reset to factory defaults (MANUFACTURER'S presets); – change of operating mode; – false alarms; – cessation or interruption of any intended operation, even if accompanied by an alarm; – initiation of any unintended operation, including unintended or uncontrolled motion, even if accompanied by an alarm; – error of a displayed numerical value sufficiently large to affect diagnosis or treatment; – noise on a waveform in which the noise would interfere with diagnosis, treatment or monitoring; – artefact or distortion in an image in which the artefact would interfere with diagnosis, treatment or monitoring; – failure of automatic diagnosis or treatment ME EQUIPMENT and ME SYSTEMS to diagnose or treat, even if accompanied by an alarm. For ME EQUIPMENT and ME SYSTEMS with multiple FUNCTIONS, the criteria apply to each FUNCTION, parameter and channel. The ME EQUIPMENT or ME SYSTEM may exhibit DEGRADATION of performance (e.g. deviation from MANUFACTURER'S specifications) that does not affect BASIC SAFETY or ESSENTIAL PERFORMANCE.

7.2 Electrostatic Discharge (ESD)

Test Requirement:	EN 60601-1-2:2015	
Test Method:	EN 61000-4-2: 2009	
Test Date:	February 24, 2020 to February 27, 2020	
Discharge Impedance:	330 W / 150 pF	
Discharge Voltage:	Air Discharge:	±8 kV
	Contact Discharge:	±6 kV
	HCP:	±6 kV
	VCP:	±6 kV
Polarity:	Positive & Negative	
Number of Discharge:	Minimum 10 times at each test point for Contact and VCP Discharge; Minimum 10 times at each test point for Air Discharge	
Discharge Mode:	Single Discharge	
Discharge Period:	1 second minimum	

7.2.1 E.U.T. Operation

Operating Environment:
Temperature: 23 °C Humidity: 46% RH Atmospheric Pressure: 1017 mbar
EUT Operation: The EUT is working normally.

7.2.2 Direct Application Test Results

Observations: Test Point:
1. All insulated enclosure & seams around EUT.
2. All touchable metal material of EUT

Direct Application		Test		Results
Discharge Level (kV)	Polarity (+/-)	Test Points	Contact Discharge	Air Discharge
8	+/-	1	N/A	Pass
6	+/-	2	Pass	N/A

Indirect Application Test Results

Observations: Test Point: 1. All sides.

Direct Application		Test		Results
Discharge Level (kV)	Polarity (+/-)	Test Point	Horizontal Coupling	Vertical Coupling
6	+/-	1	Pass	Pass

Results:
A: No degradation in the performance of the EUT was observed.
N/A: Not applicable (not required in the standard or floor mounted the EUT)

7.3 Radiated Immunity (80MHz to 2.5GHz)

Test Requirement:	EN 60601-1-2:2015
Test Method:	EN 61000-4-3: 2006/A2:2010
Test Date:	February 24, 2020 to February 27, 2020
Frequency Range:	80MHz to 2.5GHz
Test Level:	3V/m on enclosure
Modulation:	80%, 1kHz Amplitude Modulation
Criteria:	Compliance with Clause 6.2.1.10 of EN 60601-1-2:2015

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 56% RH Atmospheric Pressure: 1017 mbar

EUT Operation: The EUT is working normally.

7.3.2 Test Results

Pass

7.4 Electrical Fast Transients (EFT)

Test Requirement:	EN 60601-1-2:2015
Test Method:	EN 61000-4-4:2012
Test Date:	February 24, 2020 to February 27, 2020
Test Level:	±2.0kV on AC
Polarity:	Positive & Negative
Repetition Frequency:	5kHz
Burst Period:	300ms
Test Duration:	2 minute per level & polarity

7.4.1 E.U.T. Operation

Operating Environment:
Temperature: 25 °C Humidity: 50% RH Atmospheric Pressure: 1011 mbar

EUT Operation: The EUT is working normally.

7.4.2 Test Results On AC Supply:

Lead under Test	Level (±kV)	Coupling Direct/Clamp	EUT operating mode	Observations (Performance Criterion)
Line, Neutral,PE	±2.0	Direct	On mode	Pass

7.5 Surges

Test Requirement:	EN 60601-1-2:2015
Test Method:	EN 61000-4-5: 2014/A1:2017
Test Date:	February 24, 2020 to February 27, 2020
Test Level:	±1kV Line to Neutral, ±2kV Line to PE
Polarity:	Positive & Negative
Generator source impedance:	2Ω Line to Neutral, 12Ω Line to PE
Trigger Mode:	Internal
No. of surges:	5 positive, 5 negative at 0°, 90°, 180°, 270°.

7.5.1 E.U.T. Operation

Operating Environment:
Temperature: 25 °C Humidity: 50% RH Atmospheric Pressure: 1011 mbar

EUT Operation: The EUT is working normally.

7.5.2 Test Results:

Pulse No	Line-Line	Level (kV)	Surge Interval	Phase (deg)	Observation (Performance Criterion)
1–5	L-N	+1	60s	0°	Pass
6–10	L-N	-1	60s	0°	Pass
11–15	L-N	+1	60s	90°	Pass
16–20	L-N	-1	60s	90°	Pass
21–25	L-N	+1	60s	180°	Pass
26–30	L-N	-1	60s	180°	Pass
31–35	L-N	+1	60s	270°	Pass

36–40	L-N	-1	60s	270°	Pass
1–5	L-PE	+2	60s	0°	Pass
6–10	L-PE	-2	60s	0°	Pass
11–15	L-PE	+2	60s	90°	Pass
16–20	L-PE	-2	60s	90°	Pass
21–25	L-PE	+2	60s	180°	Pass
26–30	L-PE	-2	60s	180°	Pass
31–35	L-PE	+2	60s	270°	Pass
36–40	L-PE	-2	60s	270°	Pass
1–5	N-PE	+2	60s	0°	Pass
6–10	N-PE	-2	60s	0°	Pass
11–15	N-PE	+2	60s	90°	Pass
16–20	N-PE	-2	60s	90°	Pass
21–25	N-PE	+2	60s	180°	Pass
26–30	N-PE	-2	60s	180°	Pass
31–35	N-PE	+2	60s	270°	Pass
36–40	N-PE	-2	60s	270°	Pass

7.6 Injected Currents

Test Requirement: EN 61547: 2009
Test Method: EN 61000-4-6: 2014/AC:2015
Test Date: February 24, 2020 to February 27, 2020
Frequency Range: Test level: 0.15MHz to 80MHz 3V rms on AC Ports (unmodulated emf into 150 W)
Modulation: 80%, 1kHz Amplitude Modulation

7.6.1 E.U.T. Operation

Operating Environment:
Temperature: 24 °C Humidity: 56% RH Atmospheric Pressure: 1011 mbar

EUT Operation: The EUT is working normally.

7.6.2 Test Results:

Frequency	Line	Test Level	Modulation	Step Size	Dwell Time	Observation (Performance Criterion)
150kHz to 80MHz	AC Supply Cable	3Vrms	80%, 20Hz Amp. Mod.	1%	3S	Pass

7.7 Power-frequency magnetic field immunity test

Test Requirement:	EN 61547: 2009
Test Method:	EN 60601-1-2: 2015
Test Date:	EN 61000-4-8: 2010
Test Level:	3A/m
Field frequency:	50/60 Hz
Result:	PASS

7.7.1 E.U.T. Operation

Operating Environment

Temperature: 23 °C Humidity: 56% RH Atmospheric Pressure: 1017 mbar

EUT Operation: The EUT is working normally.

7.7.2 Test Results:

PASS

7.8 Voltage Dips and Interruptions

Test Requirement: EN 60601-1-2:2015
Test Method: EN 61000-4-11: 2004/ A1:2017
Test Date: February 24, 2020 to February 27, 2020
Test Level: 0% of UT (Supply Voltage) for 0.5 cycle
40% of UT (Supply Voltage) for 5 cycles
70% of UT (Supply Voltage) for 25 cycles
0% of UT (Supply Voltage) for 5 s
No. of Dips / Interruptions: 6 per Level

7.8.1 E.U.T. Operation

Operating Environment:
Temperature: 25 °C Humidity: 46% RH Atmospheric Pressure: 1024 mbar
EUT Operation: The EUT is working normally.

7.8.2 Test Results:

EUT operating mode	Dropout % UT	Phase	Duration of dropout in Periods	No of dropout	Time between dropout	Observations (Performance Criterion)
On mode	100	0°	0.5	3	10s	Pass
On mode	100	180°	0.5	3	10s	Pass
On mode	60	0°	5	3	10s	Pass
On mode	60	180°	5	3	10s	Pass
On mode	30	0°	25	3	10s	Pass
On mode	30	180°	25	3	10s	Pass
On mode	100	0°	250	3	10s	Pass
On mode	100	180°	250	3	10s	Pass

- End of Test Report -

Type of equipment, model: 4 Wheeler Explorer, 1013-1, 1013-2

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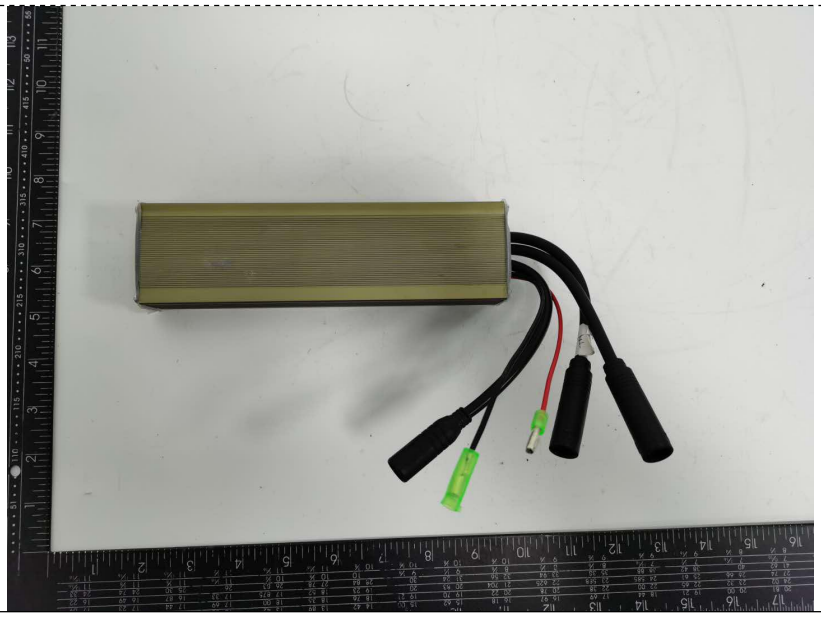

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- End of Annex I -