

This report will not be used for social proof function in China market.

| | Test report No: 6060140.50V1.1 |
|---|---|
| TEST REPORT | |
| Electromagnetic Com | patibility (EMC) |
| Identification of item tested | Air Pump |
| Trademark | N/A |
| Model and /or type reference | #62056,#62139 |
| Ratings | AC 220-240 V, 110 W |
| Test Laboratory / address | DEKRA Testing and Certification (Shanghai) Ltd. |
| | 3 F., No. 250 Jiangchangsan Road, Jing'an District, Shanghai City, 200436, China |
| Applicant's name / address | Bestway (Hongkong) International Ltd |
| | Suite 713, 7/Floor, East Wing, Tsim Sha Tsui Centre, 66 Mody Road, Kowloon, Hongkong |
| Test method requested, standard | EN 55014-1:2006+A1:2009+A2:2011 |
| | EN 55014-1:2017; |
| | EN 55014-2:2015; |
| | EN 61000-3-2:2014 |
| | EN 61000-3-3:2013 |
| Verdict Summary | IN COMPLIANCE |
| Tested by (name / position & signature) | Xingyu He |
| | Test Engineer |
| Approved by (name / position & signature) | Zuyao Fan |
| | Project Manager |
| Date of issue | 2020-04-01 |
| Report template No | TRF_EN55014-1_EN55014-2_EMC01 V1.0 |



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COMPETENCES AND GUARANTEES

DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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GENERAL CONDITIONS

- 1. This report is only referred to the item that has undergone the test.
- 2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
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UNCERTAINTY

For all measurements where guidance for the calculation of the instrumentation uncertainty of a measurement is specified in EN 55016-4-2 (CISPR 16-4-2), EN/IEC 61000-4 series or a product standard, the measurement instrumentation uncertainty has been calculated and applied in accordance with these standards.

Uncertainties have been calculated according to the DEKRA internal document. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%. Refer to the Annex 1 for furter information.

ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

| Ambient temperature | 15 °C – 35 °C |
|-----------------------|------------------|
| Relative Humidity air | 30% - 60% |
| Atmospheric pressure | 86 kPa – 106 kPa |

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.



POSSIBLE TEST CASE VERDICTS

| Test case does not apply to test object | N/A |
|---|-----------------|
| Test object does meet requirement | P (Pass) / PASS |
| Test object does not meet requirement | F (Fail) / FAIL |
| Not measured | N/M |

DEFINITION OF SYMBOLS USED IN THIS TEST REPORT

| Indicates that the listed condition, standard or equipment is applicable for this report/test/EUT. | | | | | |
|--|--|-----------|-----------|-----------|--|
| Indicates that the listed condition, standard or equipment is not applicable for this report/test/EUT. | | | | | |
| Decimal separator used in this report | | Comma (,) | \square | Point (.) | |

ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

- EUT : Equipment Under Test
- QP : Quasi-Peak CAV : CISPR Average AV : Average CDN : Coupling Decoupling Network SAC : Semi-Anechoic Chamber OATS : Open Area Test Site BW : Bandwidth : Amplitude Modulation AM ΡM : Pulse Modulation : Horizontal Coupling Plane HCP VCP : Vertical Coupling Plane $U_{\rm N}$: Nominal voltage
- N/A : Not Applicable
- *N/M* : Not Measured



DOCUMENT HISTORY

| Report nr. | Date | Description |
|----------------|------------|-----------------|
| 6060140.50 | 2019-10-24 | First release. |
| 6060140.50V1.1 | 2020-04-01 | Second release. |
| | | |

REMARKS AND COMMENTS

The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).

The test results relate only to the samples tested.

According to the declaration from manufacturer, both models are identical except the model name

The test results stated in this report of model #62056 are also representative for the others.



1 GENERAL INFORMATION

1.1 General Description of the Item(s)

| Description of the item: | Air Pump | | | |
|--|--|--|--|--|
| Model / Type number: | #62056,#62139 | | | |
| Serial number: | N/A | | | |
| Trademark: | N/A | | | |
| Manufacturer: | Bestway Inflatables & Material Corp | | | |
| | No. 3065 Cao An Road , Shanghai 201812 , P. R. China | | | |
| Factory GOLEADER INDUSTRIES (JINHUA) CO., LTD. | | | | |
| | No.618 Wenxi Road, Jinpan Development New Zone, Jinhua, Zhejiang Province, 321025, China. | | | |

| Rated power supply: | Voltage and Frequency | | Reference poles | | | | | |
|---------------------|--------------------------------|--|-----------------|----|---|----|--|--|
| | | | L2 | L3 | Ν | PE | | |
| | AC: 220-240 V | | | | | | | |
| | AC: 100 – 240 V, 50/60 Hz | | | | | | | |
| | DC: 12 V, 24 V, 12 / 24 V | | | | | | | |
| | Battery: 6 V | | | | | | | |
| Rated Power: | 110 W | | | | | | | |
| Clock frequencies: | N/A | | | | | | | |
| Other parameters: | N/A | | | | | | | |
| Mounting position: | Table top equipment | | | | | | | |
| | Wall/Ceiling mounted equipment | | | | | | | |
| | Floor standing equipment | | | | | | | |
| | Hand-held equipment | | | | | | | |
| | Other: | | | | | | | |

Intended use of the Equipment Under Test (EUT) The apparatus as supplied for the test is Air Pump, intended for residential and commercial use. These products have no electronic control unit

| No | Module/parts of test item | Туре | Manufacturer |
|----|---------------------------|------|--------------|
| 1 | N/A | | |
| | | | |
| | | | |

| No | Documents as provided by the applicant - Description | File name | Issue date |
|----|--|-----------|------------|
| | N/A | | |
| | | | |

| Modifications to the test item | \square | NI/A | Supplemental information: |
|--------------------------------|-----------|------|---------------------------|
| during testing: | | N/A | Supplemental Information. |



Copy of marking plate:

N/A

1.2 Environment

The requirements and standards apply to equipment intended for use in:

| \square | Residential (domestic) environment. |
|-------------|--|
| \boxtimes | Commercial and light-industrial environment. |
| | Industrial environment. |

1.3 **Test data**

| Test Logation | TUV Rheinland (Shanghai) Co., Ltd. | | |
|----------------------|---|--|--|
| Test Location | Np.177, 178, Lane 777 West Guangzhong Road, Jing'an District, Shanghai, China | | |
| Date(receive sample) | 2018-10 | | |
| Date (start test) | 2018-10 | | |
| Date (finish test) | 2018-10 | | |



1.4 **Classification according to EN 55014-2**

The standard EN 55014-2 is subdivided in four categories. For each category, specific immunity requirements are formulated.

| · · · · | | | | |
|--|--|--|--|--|
| | Category I: Apparatus containing no electronic control circuitry. | | | |
| \boxtimes | <u>Examples:</u> Motor operated appliances, lighting toys, track sets without electronic control units, tools, heating appliances, UV and IR radiators and apparatus containing components such as electromechanical switches and thermostats. | | | |
| | Electric circuits consisting of passive components (such as radio interference suppression capacitors or inductors, mains transformers and mains frequency rectifiers) are not considered to be electronic control circuitry. | | | |
| | <u>Category II:</u> transformer toys, dual supply toys, mains powered motor operated appliances, tools, heating appliances and similar electric apparatus (for example – UV radiators, IR radiators and microwave ovens) containing electronic control circuitry with no clock frequency higher than 15 MHz. (For toys, examples include educational computers, organs, track sets with electronic control units.) | | | |
| | Category III: equipment which in normal use, is not connected to a power network and has no cables attached. This category includes apparatus provided with rechargeable batteries, solar or other similar d.c. power sources which can be charged or operated by connecting the apparatus to the mains power. However, this apparatus shall also be tested as an apparatus in category II while it is connected to the mains network.(For toys, examples include musical soft toys, cord-controlled toys and motor-operated electronic toys.) | | | |
| | Category IV: All other apparatus covered by the scope of the EN 55014-2 standard. | | | |
| <u>Clock frequency:</u> Fundamental frequency of any signal used in the device, excluding those which are solely used inside integrated circuits (IC). | | | | |



2 **DESCRIPTION OF TEST SETUP**

2.1 **Operating mode(s) used for tests**

During the tests the following operating mode(s) has(have) been used.

| Operating mode | Operating mode description | Used for testing | | |
|---------------------------|----------------------------|------------------|-------------|--|
| | | Emission | Immunity | |
| 1 | The EUT operates normally. | \boxtimes | \boxtimes | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| Supplemental information: | | | | |

2.2 Port(s) of the EUT

| | Connected to / | Cable | | | | |
|---------------------------|----------------|-------------|-------------|----------|--|--|
| Port name and description | Termination | Length used | Attached | Shielded | | |
| | | | during test | | | |
| AC input port | AC mains | 0.8 m | \boxtimes | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Supplemental information: | | | | | | |
| | | | | | | |

2.3 Support / Auxiliary equipment / unit / software for the EUT

The EUT has been tested with the following auxiliary equipment / unit / software:

| Auxiliary equipment / unit / software | Type / Version | Manufacturer | Supplied by | | | |
|---------------------------------------|----------------|--------------|-------------|--|--|--|
| N/A | | | Applicant | | | |
| | | | DEKRA | | | |
| | | | | | | |
| | | | | | | |
| Supplemental information: | | | | | | |



2.4 **Test Configuration / Block diagram used for tests**

The following test setup / configuration / block diagram has been used during the tests:





3 VERDICT SUMMARY SECTION

This chapter presents an overview of standards and results. Refer to the next chapters for details of measured test results and applied test levels.

3.1 Standards

| Standard | Year | Description | | | | |
|---------------|------|---|--|--|--|--|
| EN 55014-1 | 2017 | Requirements for household appliances, electric tools and similar apparatus – Part 1: Emission. | | | | |
| EN 55016-2-1 | 2014 | Methods of measurement of disturbances and immunity - Conducted disturbance measurements. | | | | |
| EN 55016-2-2 | 2010 | Methods of measurement of disturbances and immunity – Measurement of disturbance power. | | | | |
| EN 55016-2-3 | 2010 | Methods of measurement of disturbances and immunity - Radiated disturbance | | | | |
| +A1 | 2010 | measurements. | | | | |
| +A2 | 2014 | | | | | |
| EN 61000-3-2 | 2014 | Limits for harmonic current emissions (equipment input current \leq 16 A per | | | | |
| | | phase). | | | | |
| EN 61000-3-3 | 2013 | Limitation of voltage changes, voltage fluctuations and flicker in public low- | | | | |
| | | voltage supply systems, for equipment with rated current ≤ 16 A per phase and | | | | |
| | | not subject to conditional connection. | | | | |
| EN 55014-2 | 2015 | Requirements for household appliances, electric tools and similar apparatus - | | | | |
| | | Part 2: Immunity – Product family standard. | | | | |
| EN 61000-4-2 | 2009 | Electrostatic discharge immunity test. | | | | |
| EN 61000-4-3 | 2006 | Radiated, radio-frequency, electromagnetic field immunity test. | | | | |
| +A1 | 2008 | | | | | |
| +A2 | 2010 | | | | | |
| EN 61000-4-4 | 2012 | Electrical fast transient/burst immunity test. | | | | |
| EN 61000-4-5 | 2014 | Surge immunity test. | | | | |
| EN 61000-4-6 | 2014 | Immunity to conducted disturbances, induced by radio-frequency fields. | | | | |
| EN 61000-4-11 | 2004 | Voltage dips, short interruptions and voltage variations immunity tests. | | | | |

3.2 **Deviation(s) from the Standard(s) / Test Specification(s)**

The following deviation(s) was / were made from the published requirements of the listed standards:

N/A.



3.3 Overview of results

| EMISSION TESTS – EN 55014-1 | | | | | |
|---|---|--|--|--|--|
| Basic standard(s) | Verdict | Remark | | | |
| EN 55016 2 1 | DV66 | | | | |
| 50 KHz – 30 MHz) | | | | | |
| Conducted disturbance voltage at load terminals | | | | | |
| (150 KHz – 30 MHz) | | | | | |
| Conducted disturbance voltage at additional terminals | | | | | |
| EN 55010-2-1 | IN/A | | | | |
| EN 55016-2-2 | PASS | See 3) | | | |
| EN 55016-2-3 | N/A | | | | |
| EN 55014-1 | N/A | See 1) | | | |
| | EN 55014-1 Basic standard(s) EN 55016-2-1 EN 55016-2-1 EN 55016-2-1 EN 55016-2-2 EN 55016-2-3 EN 55014-1 | EN 55014-1 Basic standard(s) Verdict EN 55016-2-1 PASS EN 55016-2-1 N/A EN 55016-2-1 N/A EN 55016-2-1 N/A EN 55016-2-3 N/A EN 55016-2-3 N/A EN 55016-2-3 N/A | | | |

Supplementary information:

1) Exemptions from click measurements applicable (clause 4.2.3).

2) Not applicable because no test requirements have been specified for DC/battery powered apparatus.

3) According to clause 4.3.4.2 procedure (a) of the CISRP 14-1 standard the EUT is deemed to comply in the frequency range from 300 MHz to 1000 MHz without further measurements.

| EMISSION TESTS – EN 61000-3-2, EN 61000-3-3 | | | | | |
|--|--------------|------|--|--|--|
| Requirement – Test case Basic standard(s) Verdict Remark | | | | | |
| Harmonic current emissions | EN 61000-3-2 | PASS | | | |
| Voltage changes, voltage fluctuations and flicker | EN 61000-3-3 | PASS | | | |
| | | | | | |

Supplementary information:

1) The EUT is regarded as an "Equipment with rated power of \leq 75 W". According to "Clause 7, Figure 1 - Flowchart for determining conformity" the EUT is deemed to comply with the requirements of the EN 61000-3-2 standard.

2) The EUT is regarded as a professional equipment with a total rated power greater than 1 KW. The test is not applicable.

| IMMUNITY TESTS – EN 55014-2 | | | | | | | |
|---|--------------------------------|-----------------|-----------|--|--|--|--|
| Requirement – Test case Basic standard(s) Verdict Remark | | | | | | | |
| Electrostatic discharge | EN 61000-4-2 | N/A | | | | | |
| Radio-frequency electromagnetic fields | EN 61000-4-3 | N/A | | | | | |
| Fast transients | EN 61000-4-4 | N/A | | | | | |
| Surge transient | EN 61000-4-5 | N/A | | | | | |
| Injected currents (radio-frequency common mode) | EN 61000-4-6 | N/A | | | | | |
| Voltage dips and short interruptions | EN 61000-4-11 | N/A | | | | | |
| Supplementary information: | | | | | | | |
| 1) Not applicable because no test requirements have been spe | ecified for DC/battery powered | apparatus. | | | | | |
| 2) The equipment is classified as category 1 equipment accord | ling to EN 55014-2; no immuni | ty tests are an | plicable. | | | | |



4 EMISSION TEST RESULTS

4.1 Conducted disturbance voltage - Mains VERDICT: PASS

| Standard | EN 55014-1 |
|----------------|--------------|
| Basic standard | EN 55016-2-1 |

Limits

| Frequency range [MHz] | Limit: QP [dB(μ V) ¹⁾] | Limit: AV [dB(μ V) ¹⁾] | IF BW | Detector(s) | |
|--|---|---|-------|-------------|--|
| 0,15 - 0,50 | 66 – 56 ²⁾ | 59 - 46 ²⁾ | 9 KHz | QP, CAV | |
| 0,50 - 5,0 | 56 | 46 | 9 KHz | QP, CAV | |
| 5,0 - 30 | 60 | 50 | 9 KHz | QP, CAV | |
| ¹⁾ At the transition frequency, the lower limit applies. ²⁾ The limit decreases linearly with the logarithm of the frequency. | | | | | |

Performed measurements

| Tested terminal(s) / port | \square | AC mains input power | \square | ⊠ N ⊠ L1 □ | | L2 | | L3 | | |
|---------------------------|---|--|-------------------------------|------------|--|----------|---|----|--|--|
| | | DC mains input power | oower 🗌 Positive (+) 🗌 Negati | | | tive (-) |) | | | |
| | | | | | | | | | | |
| Voltage – Mains [V] | 230 \ | /ac | | | | | | | | |
| Frequency – Mains [Hz] | 50 Hz | 2 | | | | | | | | |
| | | | | | | | | | | |
| Test method applied | | Artificial mains network | Artificial mains network | | | | | | | |
| | | Voltage probe | | | | | | | | |
| Test setup | | Table top Image: Artificial hand applied | | | | | | | | |
| | | Floor standing | Other: | | | | | | | |
| | Refer to the Annex 3 for test setup photo(s). | | | | | | | | | |
| | r | | | | | | | | | |
| Operating mode(s) used | Mode 1 | | | | | | | | | |
| Remark | | | | | | | | | | |

See next page.







| Measurement data | Port unde | r test | AC inpu | ut power | | | |
|--|--|-------------------|----------------------|--|------------------|--|--|
| Operating mode / voltage / frequency us | ed during the tes | d during the test | | Mode 1 / 230 Vac / 50 Hz with HC5410M230 | | | |
| Neutral: | | | | | | | |
| Level [dBµV] | | | | | | | |
| 70 | | | | | | | |
| | | | | | | | |
| No A Hora I III | 4 | | | | | | |
| | | | J. I. B. B. B. B. | | | | |
| 40 | | | | | | | |
| 30 30 | Munia and and and and and and and and and an | | + | | n juu kaada kaan | | |
| 20 | | . Hereine | and the local | | | | |
| 10 | | | | | | | |
| 0 | | | | | | | |
| 150k 300k 500k | 1M 2 Frequency [H | 2M 3N [z] | и 5M | 7M 10M | 30M | | |
| | | | | | | | |
| Final quasi-peak m | easurement results: | | | | | | |
| Freq | uency Level MHz dBµV | Transd dB | l Limit dBµV | Margin Line dB | | | |
| 0.1 | 55000 55.10 85000 42.90 | 9.7 | 65.7 | 10.6 N 15.3 N | | | |
| 0.4 | 10000 43.40 65000 44.20 | 9.8 9.8 | 57.6 56.6 | 14.2 N 12.4 N | | | |
| 0.4 0.6 | 8000044.200000040.80 | 9.8 9.8 | 56.3 56.0 | 12.2 N 15.2 N | | | |
| Final average meas | surement results: | | | | | | |
| Freq | uency Level MHz dBµV | Transd dB | l Limit dBµV | Margin Line dB | | | |
| 0.1 | 50000 43.40 75000 32.30 | 9.7 | 59.0 46.6 | 15.6 N 14.3 N | | | |
| 1.0 4.5 6.7 | 30000 30.40 30000 26.60 65000 27.70 | 9.8 9.9 9.9 | 46.0 46.0 50.0 | 19.4 N 22.3 N | | | |
| 23.3 | 50000 13.90 | 10.2 | 50.0 | 36.1 N | | | |
| Note: 1. All Readings are performed with Quas 2. Measurement Level = Reading Level - | i-Peak and/or av ⊦ Factor +Cable | /erage Loss. | e measur | ements as nec | essary. | | |
| | | | | | | | |
| Remark | | | | | | | |

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| Measurement data | Port under test | AC input power | |
|--|----------------------------|--|---------------|
| Operating mode / voltage / frequency use | d during the test | Mode 1 / 230 Vac / 50 Hz,w RW05 | th XZ5410S23- |
| Neutral: | | | |
| | | | |
| | | | |
| | | | |
| 70 | | | - |
| | | | |
| 60 | | | |
| 50 | | | |
| Muniter 1 | | | |
| 40 | | | |
| 30 | | The second se | |
| | man and the second and the | Land Contraction of the Land Contraction of the Con | |
| 20 | - Nellin | | |
| | | | |
| 10 | | | - |
| o | | | |
| 150k 300k 500k | 1M 2M Frequency [Hz] | 3M 5M 7M 10M 30M | |
| Frequenc MH | y Level Trans z dBµV dl | Limit Margin Line dBµV dB | |
| 0.15500 | 0 57.80 9.7 | 65.7 7.9 N | |
| 1.15000 | 0 42.40 9.1 | 56.0 13.6 N | |
| 1.19500 | 0 42.40 9.1 | 56.0 13.6 N | |
| 1.24000 | 0 42.40 9.1 | 56.0 13.6 N | |
| Final average measurem | 0 42.10 9.0 | 50.0 IS.9 N | |
| Frequence | v Lovel Trans | Limit Margin Line | |
| MH | z dBµV dl | dBµV dB | |
| 0.15000 | 0 47.20 9. | 59.0 11.8 N | |
| 1.09500 | 0 29.50 9.1 | 46.0 16.5 N | |
| 2.72000 | 0 27.50 9.1 | 46.0 18.5 N | |
| 6.96000 10.62000 | 0 20.60 10.0 | 50.0 25.8 N 50.0 29.4 N | |
| | | | |
| | | | |
| | | | |
| Note: | | | |
| 1. All Readings are performed with Quasi | -Peak and/or averag | e measurements as necessar | /. |
| 2. Measurement Level = Reading Level + | Factor +Cable Loss | | |
| - | | | |
| Demork | | | |

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Measurement data Port under test AC input power Mode 1 / 230 Vac / 50 Hz,with XZ5410S23-Operating mode / voltage / frequency used during the test **RW15** Neutral: Level [dBµV] 70.0 Limits 60.0 C14HAG 50.0 40.0 Transducer ENV216 N 30.0 Traces PK+ 1 Mar AV 20.0 10.0 5.0 1 MHz 150 kHz 10 MHz 30 MHz Final Quasi-peak measurement result: Delta Limit Frequency Level Limit (dBµV) (dBµV) (MHz) (dB) -6.74 0.1815 57.68 64.42 -16.79 39.21 0.7935 56.00 1.1355 41.19 56.00 -14.81 4.893 36.05 56.00 -19.95 6.765 41.18 60.00 -18.82 20.5125 28.15 60.00 -31.85 Final Average measurement result: Dolta Limit Т Limit The second Lovel Т

| Frequency | Level | Linnt | Detta Linnt |
|-----------|--------|--------|-------------|
| (MHz) | (dBµV) | (dBµV) | (dB) |
| 0.1545 | 48.53 | 58.68 | -10.15 |
| 0.5055 | 29.12 | 46.00 | -16.88 |
| 1.0995 | 27.50 | 46.00 | -18.50 |
| 4.92 | 23.89 | 46.00 | -22.11 |
| 6.189 | 28.48 | 50.00 | -21.52 |
| 22.551 | 15.77 | 50.00 | -34.23 |

Note:

1. All Readings are performed with Quasi-Peak and/or average measurements as necessary.

2. Measurement Level = Reading Level + Factor +Cable Loss.

Remark ----



PASS

VERDICT:

4.2 **Disturbance power (30 MHz – 300 MHz)**

| Standard | EN 55014-1 |
|----------------|--------------|
| Basic standard | EN 55016-2-2 |

Limits

| Frequency range [MHz] | Limit: QP [dB(pW)] | Limit: AV [dB(pW)] | IF BW | Detector(s) |
|--|-----------------------|-----------------------|---------|-------------|
| 30 - 300 | 45 – 55 ¹⁾ | 35 – 45 ¹⁾ | 120 KHz | QP, CAV |
| | Margin | | | |
| 200 - 300 | 0 – 10 1) | | 120 KHz | QP, CAV |
| ¹⁾ The limit increases linearly with the frequency. | | | | |

Performed measurements

| Port(s) under test | | | | | | | |
|---------------------------|----------------------|--|---------------------|--------|---------|--|---------|
| AC mains input power | AC mains input power | | Load | | | | Control |
| Other: | | | Other: | | | | Other: |
| Voltage – Mains [V] 230 \ | | | Vac | | | | |
| Frequency – Mains [Hz] | 50 Hz | 50 Hz , 60 Hz | | | | | |
| Test setup | | ☐ Floor standing | | | ing | | |
| | | Other: | | | | | |
| | Refe | to the | Annex 3 for test se | tup ph | oto(s). | | |
| Conditions for exemption | | Limits" reduced by "Margin" applied and passed | | | ssed | | |
| 300 MHz | \square | Maximum clock frequency < 30 MHz | | | | | |
| | | | | | | | |
| Operating mode(s) used | Mode | Mode 1 | | | | | |
| Remark | | | | | | | |

See next page.

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4.3 Radiated electromagnetic disturbances (30 – 1000 MHz) VERDICT: N/A

| Standard | EN 55014-1 |
|----------------|--|
| Basic standard | EN 55016-2-3 |
| Test method | Antenna method according to EN 55016-2-3 standard. |

Limits

| Frequency | l | | Detector | | | |
|---|-------|-------|----------|---------|----------|--|
| [MHz] | @3 m. | @5 m. | @10 m. | | Delector | |
| 30 - 230 | 40 | 36 | 30 | 120 KHz | QP | |
| 230 - 1000 | 47 | 43 | 37 | 120 KHz | QP | |
| ¹⁾ At the transition frequency, the lower limit applies. | | | | | | |

Performed measurements

| Port under test | Enclo | Enclosure | | |
|------------------------|---|--|--|--|
| Voltage – Mains [V] | DC-4 | .8V(for working mode), DC 5V(for charging mode) | | |
| Frequency – Mains [Hz] | | | | |
| | | | | |
| Test method applied | \bowtie | OATS or SAC with measurement distance [m]: 3 m. | | |
| | | OATS or SAC with measurement distance [m]: 5 m. | | |
| | | OATS or SAC with measurement distance [m]: 10 m. | | |
| Test setup | \boxtimes | Equipment on a table of 80 cm height | | |
| | | Equipment on the floor (insulated from ground plane) | | |
| | | Other: | | |
| | Refer to the Annex 3 for test setup photo(s). | | | |
| | | | | |
| Operating mode(s) used | Mode 1 | | | |
| Remark | | | | |



4.4 Discontinuous disturbance (clicks) on AC power leads VERDICT: N/A

| Standard | EN 55014-1 | | |
|-----------------|--------------------|-------|-----------------|
| Frequency [MHz] | Limit: QP [dB(µV)] | IF BW | Detector |
| 0,15 | 66 | 9 KHz | Quasi-Peak (QP) |
| 0,50 | 56 | 9 KHz | Quasi-Peak (QP) |
| 1,40 | 56 | 9 KHz | Quasi-Peak (QP) |
| 30,0 | 60 | 9 KHz | Quasi-Peak (QP) |

Performed measurements

| Voltage – Mains [V] | 230 Vac | | | |
|------------------------|---|--|--|--|
| Frequency – Mains [Hz] | 50 Hz , 60 Hz | | | |
| | | | | |
| lest method applied | Artificial mains network | | | |
| | U Voltage probe | | | |
| Test setup | Table top Floor standing | | | |
| | Other: | | | |
| | Refer to the Annex 3 for test setup photo(s). | | | |
| | | | | |
| Operating mode(s) used | Mode 1 | | | |
| Remark | | | | |

| Reason for n | ot | | The a | nplituc | les of | the observe | ed dist | urbance | es were | all be | ow th | e limit for |
|------------------|--|---------------------------|--|--------------------------|-------------------|----------------------------------|---|--------------------|----------------------------|--------------------------|--------|-----------------------------------|
| performing th | e test | ₩ | continuous disturbance, these are not considered to be clicks. | | | | | | | | | |
| | | | | | | | | | | | | |
| Measuremen | t results | X | Neutra | ŀ | \bowtie | Line 1 | E |] Line | -2 | | Line | 3 |
| Froqueney | | | First M | easure | ement: | Determinatio | n of the | ə limit L | _{Գ –} Quas | i-peak | | |
| (MHz) | Limit <i>L</i> (dBµV) | Number of short clicks | | Number of long clicks | | Number of clicks — <i>N</i> ₁ | Time of meas. (min.) | | Click rate N | Increased limit (dB) | | Increased Limit-L ₉ |
| 0,15 | 66 | | θ | (| Ð | θ | 12 | 20 | 5 | 1 | 6 | 82 |
| 0,5 | 56 | | 0 6 | | ÷ | θ | 1 | 20 | 5 | 16 | | 72 |
| 1,4 | 56 | | θ θ | | ÷ | θ | 120 | | 5 | 16 | | 72 |
| 30 | 60 | | 0 € | | Ð | θ | 120 | | 5 | 16 | | 76 |
| | The calcul | ated c | lick rate | N is n | ot mor | e than 5 time | s per n | ninute a | and all the | clicks clicks | are cl | assified as |
| \bowtie | short (t ≤ | <u>10 n</u> | ns). Thu | s, the | EUT | is deemed | t o com | ply wit | h the lim | nits wit | hout a | any further |
| | measurem | ent at | an incre | ased I | imit. | | | | | | | |
| Froqueney | | | Secon | d meas | sureme | ent with Limit | = L_q (L | lpper q | uartile me | thod): | | |
| (MHz) | Limit Lq (dBµV) | Num | ber of c - N ₂ | icks | 4 | Number of au | thorize | d clicks | <u>N2 ≤N1/⁄</u> | 1 | 2 | Verdict |
| 0,15 | | | | | | | | | | | | |
| 0,5 | | | | | | | | | | | | |
| 1,4 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | |
| Supplementa | ry informati | <u>on:</u> | | | | | | | | | | |



4.5 Harmonic current emissions

VERDICT: PASS

| Standard | EN 610 | EN 61000-3-2 | | | | |
|--|--------|---|--|--|--|--|
| Exlusions | | Arc welding equipment intended for professional use. | | | | |
| (For these categories of | | System(s) with nominal voltage(s) less than 220 V_{AC} (line-to-neutral). | | | | |
| equipment, limits are not specified in the EN 61000- | | Equipment with rated power of \leq 75 W (other than lighting equipment). | | | | |
| 3-2 standard) | | Professional equipment with total rated power > 1 kW. | | | | |
| | | Symmetrically controlled heating elements with a rated power \leq 200 W. | | | | |
| | | Independent dimmers for incandescent lamps with rated power \leq 1 kW. | | | | |

| Classific | cation | | | | | | |
|-----------|---------|-----------------|---|--|--|--|--|
| \square | Class A | All app | II apparatus not classified as Class B, C or D | | | | |
| | Class B | Portab | Portable tools, arc welding equipment which is not professional equipment. | | | | |
| | | | Lighting equipment with active input power > 25 W | | | | |
| | Class C | | Lighting equipment with active input power ≤ 25 W (First requirement, Table 3 column 2) | | | | |
| | | | Lighting equipment with active input power ≤ 25 W (Second requirement) | | | | |
| | Class D | Persor or mo | Personal computers, television receivers, refrigerators and freezers having one or more variable-speed drives to control compressor motor(s). | | | | |

Performed measurements

| Port under test | AC ma | AC mains power input | | | | | | | |
|---------------------------|--------|--|-------------|---------------------|-----------|----------------------|--|--|--|
| Voltage – Mains [V] | 230 Va | 230 Vac | | | | | | | |
| Frequency – Mains [Hz] | 50Hz | 50Hz | | | | | | | |
| | | | | | | | | | |
| Observation peroid | | 6.5 min. | \boxtimes | 2.5 min. | | Other: | | | |
| Version of measurement | | EN 61000-4-7:2002 + AM1:2009 (IEC 61000-4-7:2002+AM1:2008) | | | | | | | |
| EN / IEC61000-4-7 (Cl. 7) | | EN 61000-4-7:1991 | | | | | | | |
| Control principle used in | | Comply with the | e require | ements of the Claus | se 6.1 (I | EN / IEC 61000-3-2). | | | |
| the EUT | | Not comply with the requirements of the Clause 6.1 (EN / IEC 61000-3-2). | | | | | | | |
| | | | | | | | | | |
| Operating mode(s) used | Mode 1 | | | | | | | | |
| Remark | | | | | | | | | |

See next page.

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| ating mode | / voltage / freque | ency used durin | g the test | Mode | 1 / 230 Vac / | 50 Hz | | | |
|--|--------------------|-----------------|-------------|------|---------------|--------|--|--|--|
| n HC5410M2 | 30 | | | | | | | | |
| Fundamental current I1: 0.495A; Power factor: 0.985; Active input power: 112.8W. | | | | | | | | | |
| Harmonic | Result (avg.) | 100% limit | Result (max | .) 1 | 50% limit | Result | | | |
| order | (A) | (A) | (A) | | (A) | Result | | | |
| 2 | 0.002 | 1.080 | 0.002 | | 1.620 | Pass | | | |
| 3 | 0.066 | 2.300 | 0.069 | | 3.450 | Pass | | | |
| 4 | 0.001 | 0.430 | 0.002 | | 0.645 | Pass | | | |
| 5 | 0.002 | 1.140 | 0.003 | | 1.710 | Pass | | | |
| 6 | 0.001 | 0.300 | 0.001 | | 0.450 | Pass | | | |
| 7 | 0.003 | 0.770 | 0.004 | | 1.155 | Pass | | | |
| 8 | 0.001 | 0.230 | 0.002 | | 0.345 | Pass | | | |
| 9 | 0.002 | 0.400 | 0.002 | | 0.600 | Pass | | | |
| 10 | 0.001 | 0.184 | 0.001 | | 0.276 | Pass | | | |
| 11 | 0.001 | 0.330 | 0.001 | | 0.495 | Pass | | | |
| 12 | 0.001 | 0.153 | 0.002 | | 0.230 | Pass | | | |
| 13 | 0.001 | 0.210 | 0.001 | | 0.315 | Pass | | | |
| 14 | 0.001 | 0.131 | 0.001 | | 0.197 | Pass | | | |
| 15 | 0.001 | 0.150 | 0.001 | | 0.225 | Pass | | | |
| 16 | 0.001 | 0.115 | 0.001 | | 0.173 | Pass | | | |
| 17 | 0.001 | 0.132 | 0.001 | | 0.199 | Pass | | | |
| 18 | 0.001 | 0.102 | 0.001 | | 0.153 | Pass | | | |
| 19 | 0.001 | 0.118 | 0.001 | | 0.178 | Pass | | | |
| 20 | 0.001 | 0.092 | 0.001 | | 0.138 | Pass | | | |
| 21 | 0.001 | 0.107 | 0.001 | | 0.161 | Pass | | | |
| 22 | 0.001 | 0.084 | 0.001 | | 0.125 | Pass | | | |
| 23 | 0.001 | 0.098 | 0.001 | | 0.147 | Pass | | | |
| 24 | 0.001 | 0.077 | 0.001 | | 0.115 | Pass | | | |
| 25 | 0.001 | 0.090 | 0.001 | | 0.135 | Pass | | | |
| 26 | 0.000 | 0.071 | 0.001 | | 0.106 | Pass | | | |
| 27 | 0.001 | 0.083 | 0.001 | | 0.125 | Pass | | | |
| 28 | 0.001 | 0.066 | 0.001 | | 0.099 | Pass | | | |
| 29 | 0.001 | 0.078 | 0.001 | | 0.116 | Pass | | | |
| 30 | 0.000 | 0.061 | 0.001 | | 0.092 | Pass | | | |
| 31 | 0.000 | 0.073 | 0.001 | | 0.109 | Pass | | | |
| 32 | 0.000 | 0.058 | 0.001 | | 0.086 | Pass | | | |
| 33 | 0.000 | 0.068 | 0.001 | | 0.102 | Pass | | | |
| 34 | 0.000 | 0.054 | 0.000 | | 0.081 | Pass | | | |
| 35 | 0.000 | 0.064 | 0.000 | | 0.096 | Pass | | | |
| 36 | 0.000 | 0.051 | 0.000 | | 0.077 | Pass | | | |
| 37 | 0.000 | 0.061 | 0.000 | | 0.091 | Pass | | | |
| 38 | 0.000 | 0.048 | 0.001 | | 0.073 | Pass | | | |
| 39 | 0.000 | 0.058 | 0.000 | | 0.087 | Pass | | | |
| 40 | 0.000 | 0.046 | 0.000 | | 0.069 | Pass | | | |



| asurement da | ata | | Port under test | AC input power | | | | |
|--|--------------------|---------------|-------------------|------------------|-----------|--|--|--|
| erating mode / | / voltage / freque | ncy used duri | ng the test | Mode 1 / 230 Va | c / 50 Hz | | | |
| n XZ5410S23- | RW05 | | | | | | | |
| Equipment ca | tegory: Class A: | Test voltage: | AC 229,43V, 5 | 0Hz | | | | |
| Fundamental | current I1: 0 464 | A: Power fac | tor: 0.985: Activ | e input nower: 1 | 05.8W | | | |
| Harmonic Result (avg.) 100% limit Result (max.) 150% limit | | | | | | | | |
| order | (A) | (A) | (A) | (A) | Result | | | |
| 2 | 0.001 | 1.080 | 0.001 | 1.620 | Pass | | | |
| 3 | 0.058 | 2.300 | 0.062 | 3.450 | Pass | | | |
| 4 | 0.001 | 0.430 | 0.001 | 0.645 | Pass | | | |
| 5 | 0.002 | 1.140 | 0.002 | 1.710 | Pass | | | |
| 6 | 0.001 | 0.300 | 0.001 | 0.450 | Pass | | | |
| 7 | 0.002 | 0.770 | 0.003 | 1,155 | Pass | | | |
| 8 | 0.001 | 0.230 | 0.001 | 0.345 | Pass | | | |
| 9 | 0.001 | 0.400 | 0.002 | 0.600 | Pass | | | |
| 10 | 0.001 | 0.184 | 0.001 | 0.276 | Pass | | | |
| 11 | 0.001 | 0.330 | 0.001 | 0.495 | Pass | | | |
| 12 | 0.001 | 0.153 | 0.001 | 0.230 | Pass | | | |
| 13 | 0.000 | 0.210 | 0.000 | 0.315 | Pass | | | |
| 14 | 0.001 | 0.131 | 0.001 | 0.197 | Pass | | | |
| 15 | 0.000 | 0.150 | 0.000 | 0.225 | Pass | | | |
| 16 | 0.001 | 0.115 | 0.001 | 0.173 | Pass | | | |
| 17 | 0.000 | 0.132 | 0.000 | 0.199 | Pass | | | |
| 18 | 0.000 | 0.102 | 0.000 | 0.153 | Pass | | | |
| 19 | 0.000 | 0.118 | 0.000 | 0.178 | Pass | | | |
| 20 | 0.000 | 0.092 | 0.000 | 0.138 | Pass | | | |
| 21 | 0.000 | 0.107 | 0.000 | 0.161 | Pass | | | |
| 22 | 0.000 | 0.084 | 0.000 | 0,125 | Pass | | | |
| 23 | 0.000 | 0.098 | 0.000 | 0.147 | Pass | | | |
| 24 | 0.000 | 0.077 | 0.000 | 0.115 | Pass | | | |
| 25 | 0.000 | 0.090 | 0.000 | 0.135 | Pass | | | |
| 26 | 0.000 | 0.071 | 0.001 | 0,106 | Pass | | | |
| 27 | 0.000 | 0.083 | 0.000 | 0.125 | Pass | | | |
| 28 | 0.000 | 0.066 | 0.001 | 0.099 | Pass | | | |
| 29 | 0.000 | 0.078 | 0.000 | 0,116 | Pass | | | |
| 30 | 0.000 | 0.061 | 0.000 | 0.092 | Pass | | | |
| 31 | 0.000 | 0.073 | 0.000 | 0.109 | Pass | | | |
| 32 | 0.000 | 0.058 | 0.000 | 0.086 | Pass | | | |
| 33 | 0.000 | 0.068 | 0.000 | 0.102 | Pass | | | |
| 34 | 0.000 | 0.054 | 0.000 | 0.081 | Pass | | | |
| 35 | 0.000 | 0.064 | 0.000 | 0.096 | Pass | | | |
| 36 | 0.000 | 0.051 | 0.000 | 0.077 | Pass | | | |
| 37 | 0.000 | 0.061 | 0.000 | 0.091 | Pass | | | |
| 38 | 0.000 | 0.048 | 0.000 | 0.073 | Pass | | | |
| 39 | 0.000 | 0.058 | 0.000 | 0.087 | Pass | | | |
| 40 | 0.000 | 0.046 | 0.000 | 0.069 | Pass | | | |

Remark ----



4.6 Voltage changes, voltage fluctuations and flicker

VERDICT: PASS

| Standard | EN 61000-3-3 |
|----------|--------------|
|----------|--------------|

Limits

| Pst (Short term flicker) | \square | ≤ 1 | | Not Applicable | | | | |
|--|---------------------------|-------------------------|--|----------------|--|--|--|--|
| PLT (Long term flicker) | \square | ≤ 0,65 | | Not Applicable | | | | |
| dc (Relative Voltage change) | \square | ≤ 3 , 3 % | | Not Applicable | | | | |
| T _{MAX} (Maximum time duration) | \square | 500ms | | Not Applicable | | | | |
| d _{MAX} (Max. voltage change) | \square | ≤ 4% | | 6% | | | | |
| | | 7% | | Not Applicable | | | | |
| Supplemental information: | Supplemental information: | | | | | | | |
| | | | | | | | | |

Performed measurements

| Reason for not performing the measurement(s) | | Tests are not necessary because the EUT is unlikely to produce significant voltage fluctuations or flicker (clause 6.1). | | | | | | |
|--|-------------------|--|---------|---------------------|----------|------------|--|--|
| Port under test | AC Ma | ins power inp | ut | | | | | |
| Voltage – Mains [V] | 230 Va | | | | | | | |
| Frequency – Mains [Hz] | 50Hz | | | | | | | |
| Test method | | Flickermeter according EN / IEC 61000-4-15:2011 | | | | | | |
| | | Simulation (| Clause | 4.2.3 of EN / IEC 6 | 1000-3- | 3) | | |
| | | Analytical m | ethod (| Clause 4.2.4 of EN | / IEC 6′ | 1000-3-3) | | |
| | | Use of $P_{st} =$ | 1 curve | (Clause 4.2.5 of El | N / IEC | 61000-3-3) | | |
| Observation peroid | | 10 min. | | 120 min. | | Other: | | |
| | | 24 times switching according to Annex B | | | | | | |
| Operating mode(s) used | Mode ² | 1 | | | | | | |
| Remark | | | | | | | | |

See next page.



| Measurement data | Port under test | AC input power |
|-------------------------------------|------------------|----------------|
| Operating mode used during the test | Mode 1 / 230 Vac | / 50 Hz |

Results

Table 4: Voltage fluctuations and flicker measurement results for #62056 withHC5410M230

| | d_c | d_{max} | T_{max} | P_{st} | P_{lt} |
|--------|-------|-----------|-----------|----------|----------|
| Limits | 3.3% | 7% | 500ms | N/A | N/A |
| Result | 0% | 1.06% | 0ms | - | - |

Table 5: Voltage fluctuations and flicker measurement results for #62056 withXZ5410S23-RW05

| | d_c | d_{max} | T_{max} | P_{st} | P_{lt} |
|--------|-------|-----------|-----------|----------|----------|
| Limits | 3.3% | 7% | 500ms | N/A | N/A |
| Result | 0% | 0.32% | 0ms | - | - |



5 **IMMUNITY TEST RESULTS**

5.1 **Performance (Compliance) criteria**

[According to EN 55014-2 (CISPR 14-2)]

<u>Performance criteria A</u>: 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.

<u>Performance criteria B</u>: 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 reasonable expect from the apparatus if used as intended.

<u>Performance criteria C :</u> 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 instruction for use.

5.1.1 **Performance criteria related to immunity tests**

| Immunity test | Performance criteria |
|---|----------------------|
| Electrostatic discharge | В |
| Radio-frequency electromagnetic fields | А |
| Fast transients | В |
| Surge transient | В |
| Injected currents (radio-frequency common mode) | А |
| Voltage dips and short interruptions | С |

5.1.2 Manufacturer defined performance criteria

Not provided.



6 **IDENTIFICATION OF THE EQUIPMENT UNDER TEST**

EUT PHOTOS





7 ANNEX 1 – MEASUREMENT UNCERTAINTIES

Expanded : 3.39dB measurement uncertainty (*k*=2) Expanded measurement uncertainty (*k*=2) : 4.32dB

8 ANNEX 2 – USED EQUIPMENT

| No. | Equipment/software name | Model | Serial no./ | Cal. due date |
|-----|-----------------------------------|-------------|------------------|---------------|
| | | | software version | |
| 1. | 3m modified semi-anechoic chamber | SAC3 | FJ129002 | 04.02.2019 |
| 2. | EMI test receiver | ESCI | 100280 | 01.11.2019 |
| 3. | Bilog antenna | CBL 6112D | 40530 | 13.02.2020 |
| 4. | EMC measurement software | EMC32 | 10.01.00 | N/A |
| 5. | Barometer | DYM3 | 08102717 | 03.04.2021 |
| 6. | ESD generator | NSG 435 | 5506 | 21.06.2019 |
| 7. | Fully Anechoic Chamber | FAC3plus | FJ139001 | 24.07.2019 |
| 8. | Signal Generator | SMR20 | 101393 | 02.11.2020 |
| 9. | Power Amplifier | 80RF1000-30 | 1077138 | 01.11.2019 |
| 10. | Average Power Sensor | NRP6AN | 101102 | 13.01.2019 |
| 11. | Average Power Sensor | NRP6AN | 101103 | 13.01.2019 |
| 12. | Broadband Field Meter | NBM-520 | C-0120 | 05.07.2019 |
| 13. | E-field Probe | EF1891 | A-0387 | 05.07.2019 |
| 14. | EMS Antenna | HL 046 | 100039 | N/A |



9 ANNEX 3 – TEST PHOTOS

Conducted disturbance voltage







Harmonic current emissions Voltage changes, voltage fluctuations and flicker



End of the report