**DEKRA Testing and Certification (Shanghai) Ltd.**
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TEL: +86-21-6056 7666 / FAX: +86-21-6056 7555

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

Test report No:
6076844.50

# TEST REPORT
# Electromagnetic Compatibility (EMC)

| | |
|---|---|
| Identification of item tested | Disk-type Sander (Concrete Grinder) |
| Trademark | AGP |
| Model and /or type reference | SM5; G125; CG5; HG5; HG125; CG125; VG5; VG125; CGR125; G5; BS-1255; 2530-442200; SMD CGR125-220<br>SM7; CG7; CG180; G180; G7; HG7; HG180; VG7; VG180; CGR180; BS-1805; SMD CGR180-220 |
| Ratings | SM5; G125; CG5; HG5; HG125; CG125; VG5; VG125; CGR125; G5; BS-1255; 2530-442200; SMD CGR125-220:<br>220-240 V; 50-60 Hz; 2200 W; n: 4500-9500 /min; Ø125 mm; Class II<br>110-120 V; 50-60 Hz; 1700 W; n: 4500-9500 /min; Ø125 mm; Class II<br><br>SM7; CG7; CG180; G180; G7; HG7; HG180; VG7; VG180; CGR180; BS-1805; SMD CGR180-220:<br>220-240 V; 50-60 Hz; 2200 W; n: 3200-6500 /min; Ø180 mm; Class II<br>110-120 V; 50-60 Hz; 1700 W; n: 3200-6500 /min; Ø180 mm; Class II |
| Test Laboratory / address | DEKRA Testing and Certification (Shanghai) Ltd. |
| Applicant / address | LEE YEONG INDUSTRIAL CO., LTD.<br>No.2, Kejia Rd., Douliu City, Yunlin County 64057, Taiwan |
| Test method requested, standard | EN 55014-1:2017;<br>EN 55014-2:2015;<br>EN 61000-3-2:2014;<br>EN 61000-3-3:2013 |
| Verdict Summary | IN COMPLIANCE |
| Tested by | Kaiyuan Dai<br>(Project Engineer)  |

| | |
|---|---|
| Approved by | Zuyao Fan<br>(Project Manager)  |
| Date of issue | 2020-04-24 |
| Report template No | TRF_EN55014-1_EN55014-2_EMC02 V1.0 |

# INDEX

**page**

## 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.



## 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.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.
5. The information provided by the customer in this report may affect the validity of the results, the test lab is not responsible for it.
6. The test results presented in this report relate only to the object tested.

## 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%.

## 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 (,) | ☐ | 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
AM : Amplitude Modulation
PM : Pulse Modulation
HCP : Horizontal Coupling Plane
VCP : Vertical Coupling Plane
$U_N$ : Nominal voltage

## DOCUMENT HISTORY

| Report nr. | Date | Description |
|---|---|---|
| 6076844.50 | 2020-04-24 | First release |
| | | |
| | | |

The report is issued to base on original test report Ref. No. 6009318.50 dated on

2017-05-18 including the following modifications:

- Add new models

SM5; G125; CG5; HG5; HG125; CG125; VG5; VG125; CGR125; G5; BS-1255; 2530-442200; SMD CGR125-220 are same except the models' name. SM7; CG7; CG180; G180; G7; HG7; HG180; VG7; VG180; CGR180; BS-1805; SMD CGR180-220 are same except the models' name.
After review, no test was considered necessary.

## REMARKS AND COMMENTS

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

The test results relate only to the samples tested.

According to the declaration from manufacturer,
SM5 and SM7 share the same construction and components, only the speed reducing gear and capacity of sanding head of them are different.

Therefore, model SM5 was selected for the full test and the result is also representative for all models as well.

# 1 GENERAL INFORMATION

## 1.1 General Description of the Item(s)

| | |
|---|---|
| Description of the item .....: | Disk-type Sander (Concrete Grinder) |
| Model / Type number .....: | SM5 |
| Representative Types .....: | G125; CG5; HG5; HG125; CG125; VG5; VG125; CGR125; G5; BS-1255; 2530-442200; SMD CGR125-220<br>SM7; CG7; CG180; G180; G7; HG7; HG180; VG7; VG180; CGR180; BS-1805; SMD CGR180-220 |
| Trademark .....: | AGP |
| Manufacturer.....: | LEE YEONG INDUSTRIAL CO., LTD.<br>No.2, Kejia Rd., Douliu City, Yunlin County 64057, Taiwan |
| Factory .....: | LEE YEONG INDUSTRIAL CO., LTD.<br>No.2, Kejia Rd., Douliu City, Yunlin County 64057, Taiwan |

| | | |
|---|---|---|
| Rated Power .....: | SM5; G125; CG5; HG5; HG125; CG125; VG5; VG125; CGR125; G5; BS-1255; 2530-442200; SMD CGR125-220:<br>220-240 V; 50-60 Hz; 2200 W; n: 4500-9500 /min; Ø125 mm; Class II<br>110-120 V; 50-60 Hz; 1700 W; n: 4500-9500 /min; Ø125 mm; Class II<br><br>SM7; CG7; CG180; G180; G7; HG7; HG180; VG7; VG180; CGR180; BS-1805; SMD CGR180-220:<br>220-240 V; 50-60 Hz; 2200 W; n: 3200-6500 /min; Ø180 mm; Class II<br>110-120 V; 50-60 Hz; 1700 W; n: 3200-6500 /min; Ø180 mm; Class II | |
| Clock frequencies .....: | Not provided | |
| 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) |
|---|
| This tool is intended for sanding surface of stone materials without the use of water. |

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

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

Copy of marking plate:




## 1.2 Environment

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

| | |
|---|---|
| ☒ | Residential (domestic) environment. |
| ☒ | Commercial and light-industrial environment. |
| ☐ | Industrial environment. |

## 1.3 Test Location

| | |
|---|---|
| Location | DEKRA Testing and Certification (Shanghai) Ltd. |
| Address | No.250, Jiangchangsan Road, Jing'an District, Shanghai, China |
| Date | Apr. 2015 (Samples provided by applicant) |
| Supervised by | Zuyao Fan |

## 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.<br>Examples: 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.<br>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. |
| ☒ | **Category II:** 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 internal clock frequency or oscillator frequency higher than 15 MHz. |
| ☐ | **Category III:** Battery powered apparatus (with built-in batteries or external batteries), which in normal use is not connected to the mains, containing an electronic control circuitry with no internal clock frequency or oscillator frequency higher than 15 MHz. |
| ☐ | **Category IV:** All other apparatus covered by the scope of the EN 55014-2 standard. |
| **Clock frequency: F**undamental 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 | Normal operation | ☒ | ☒ |
| 2 | | ☐ | ☐ |
| 3 | | ☐ | ☐ |
| 4 | | ☐ | ☐ |
| 5 | | ☐ | ☐ |
| 6 | | ☐ | ☐ |
| Supplemental information: | | | |

## 2.2 Port(s) of the EUT

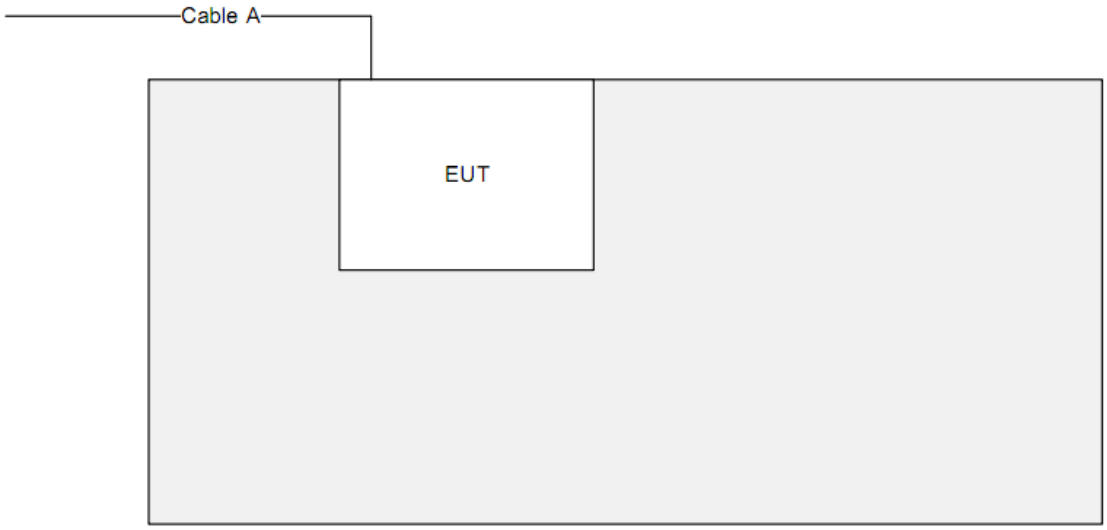
| Port name and description | Connected to / Termination | Cable | | |
|---|---|---|---|---|
| | | Length used during test [m] | Attached during test | Shielded |
| N/A | | | ☐ | ☐ |
| | | | ☐ | ☐ |
| | | | ☐ | ☐ |
| | | | ☐ | ☐ |
| | | | ☐ | ☐ |
| Supplemental information: | | | | |

## 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 | | | |
| | | | |
| | | | |
| | | | |
| Supplemental information: | | | |

## 2.4 Test Configuration / Block diagram used for tests

| Test Configuration / Block diagram |
|---|
|  |



| Cable Type | | Signal cable Description |
|---|---|---|
| A | Mains Cable | Non-Shielded, 1 m, 2 pin |

# 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 [1)] | 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<br>+A1<br>+A2 | 2010<br>2010<br>2014 | Methods of measurement of disturbances and immunity – Radiated disturbance measurements. |
| EN 61000-3-2 | 2014 | Limits for harmonic current emissions (equipment input current ≤ 16 A per phase). |
| EN 61000-3-3 | 2013 | Limitation of voltage fluctuations and flicker |
| EN 55014-2 | 2015 [1)] | 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<br>+A1<br>+A2 | 2006<br>2008<br>2010 | Radiated, radio-frequency, electromagnetic field immunity test. |
| 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. |

50) Not harmonized yet.

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

No deviation.

## 3.3 Overview of results

| EMISSION TESTS – EN 55014-1 | | | |
|---|---|---|---|
| **Requirement – Test case** | **Basic standard(s)** | **Verdict** | **Remark** |
| Conducted disturbance voltage at mains terminals (150 KHz – 30 MHz) | EN 55016-2-1 | PASS | --- |
| Conducted disturbance voltage at load terminals (150 KHz – 30 MHz) | EN 55016-2-1 | N/A | --- |
| Conducted disturbance voltage at additional terminals (150 KHz – 30 MHz) | EN 55016-2-1 | N/A | --- |
| Disturbance power (30 MHz to 300 MHz) | EN 55016-2-2 | PASS | See 2) |
| Radiated electromagnetic disturbances (30 – 1000 MHz) | EN 55016-2-3 | N/A | --- |
| Discontinuous disturbance (clicks) on AC power leads | EN 55014-1 | N/A | See 1) |
| Supplementary information:<br>1) Exemptions from click measurements applicable (clause 4.2.3).<br>2) According to clause 4.1.2.3.2 procedure (a) of the EN 55014-1 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: | | | |

| IMMUNITY TESTS – EN 55014-2 | | | |
|---|---|---|---|
| **Requirement – Test case** | **Basic standard(s)** | **Verdict** | **Remark** |
| Electrostatic discharge | EN 61000-4-2 | PASS | |
| Radio-frequency electromagnetic fields | EN 61000-4-3 | N/A | |
| Fast transients | EN 61000-4-4 | PASS | |
| Surge transient | EN 61000-4-5 | PASS | |
| Injected currents (radio-frequency common mode) | EN 61000-4-6 | PASS | |
| Voltage dips and short interruptions | EN 61000-4-11 | PASS | |
| Supplementary information:<br>1) The equipment is classified as category 1 equipment according to EN 55014-2; no immunity tests are applicable. | | | |

# 4 EMISSION TEST RESULTS

| 4.1 | **Conducted disturbance voltage – Mains** | **VERDICT: PASS** |
|---|---|---|

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

**Limits – Tools**

| Frequency range [MHz] | Limit: QP [dB(µV)[1]] | Limit: AV [dB(µV) [1]] | IF BW | Detector(s) |
|---|---|---|---|---|
| 0,15 - 0,35 | 66 – 56 [2] | 59 - 46 [2] | 9 KHz | QP, CAV |
| 0,35 - 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.

| | | |
|---|---|---|
| ☐ | Rated power below 700 W | Limits as above |
| ☐ | Rated power between 700 and 1000 W | Limits +4 dB |
| ☒ | Rated power above 1000 W | Limits +10 dB |

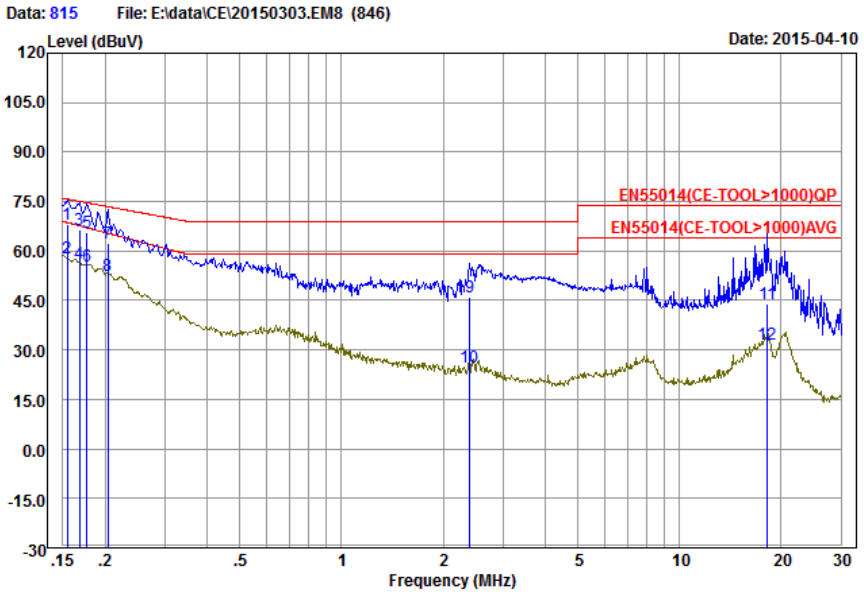
**Performed measurements**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Scan range (0,9 – 1,1 $U_N$) | ☐ | 198 – 264 $V_{AC}$ | ☐ | 207 – 253 $V_{AC}$ | | ☒ | 230/120 $V_{AC}$ | | | |
| Tested terminal(s) / port | ☒ | AC mains input power | ☒ | N | ☒ L1 | ☐ | L2 | ☐ | L3 | |
| | ☐ | DC mains input power | ☐ | Positive (+) | | ☐ | Negative (-) | | | |

| | | | | |
|---|---|---|---|---|
| Voltage – Mains [V] | 230/120 Vac | | | |
| Frequency – Mains [Hz] | 50 Hz | | | |
| Test method applied | ☒ | Artificial mains network | | |
| | ☐ | Voltage probe | | |
| Test setup | ☒ | Table top | ☒ | Artificial hand applied |
| | ☐ | Floor standing | ☐ | Other: |
| | Refer to the Annex 3 for test setup photo(s). | | | |
| Operating mode(s) used | Mode 1 | | | |
| Remark | --- | | | |

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

**Line**

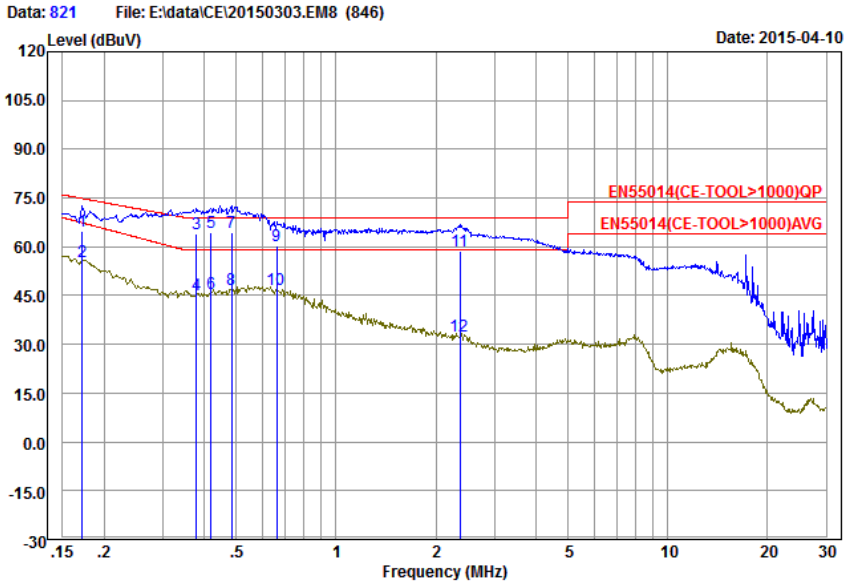



| | | Freq | Limit Line | Level | Read Level | Factor | Cable Loss | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dBuV | dBuV | dB | dB | dB | |
| 1 | pp | 0.15 | 75.74 | 67.97 | 57.12 | 10.85 | 1.17 | -7.77 | QP |
| 2 | av | 0.15 | 68.62 | 57.70 | 46.85 | 10.85 | 1.17 | -10.92 | Average |
| 3 | | 0.17 | 75.08 | 66.65 | 55.86 | 10.79 | 1.15 | -8.43 | QP |
| 4 | | 0.17 | 67.69 | 56.26 | 45.47 | 10.79 | 1.15 | -11.43 | Average |
| 5 | | 0.18 | 74.64 | 65.74 | 54.98 | 10.76 | 1.14 | -8.90 | QP |
| 6 | | 0.18 | 67.06 | 55.35 | 44.59 | 10.76 | 1.14 | -11.71 | Average |
| 7 | | 0.20 | 73.46 | 62.55 | 51.89 | 10.66 | 1.10 | -10.91 | QP |
| 8 | | 0.20 | 65.37 | 52.53 | 41.87 | 10.66 | 1.10 | -12.84 | Average |
| 9 | | 2.40 | 69.00 | 46.22 | 35.19 | 11.03 | 1.38 | -22.78 | QP |
| 10 | | 2.40 | 59.00 | 24.92 | 13.89 | 11.03 | 1.38 | -34.08 | Average |
| 11 | | 18.23 | 74.00 | 44.16 | 32.59 | 11.57 | 1.84 | -29.84 | QP |
| 12 | | 18.23 | 64.00 | 31.75 | 20.18 | 11.57 | 1.84 | -32.25 | Average |

| Remark | |
|---|---|

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

**Neutral**

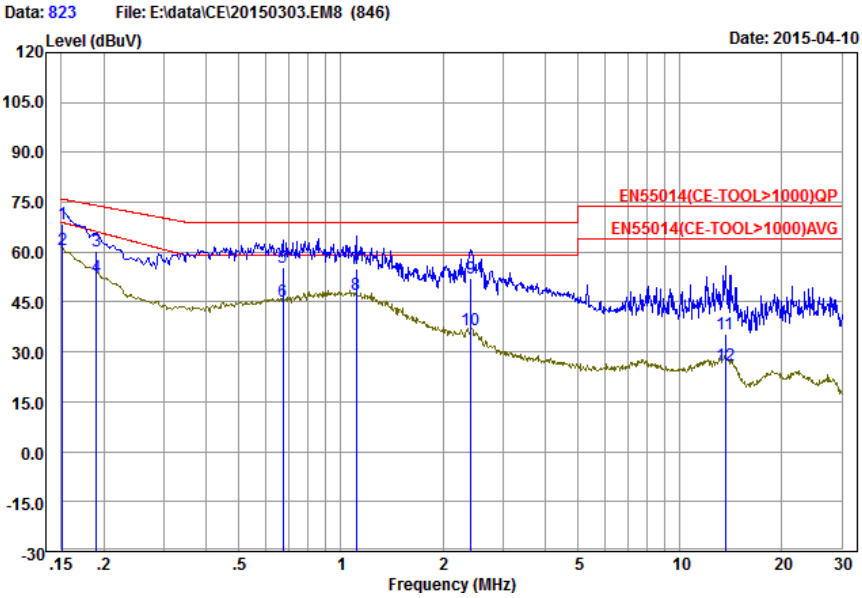



| | Freq | Limit Line | Level | Read Level | Factor | Cable Loss | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dBuV | dBuV | dB | dB | dB | |
| 1 | 0.17 | 74.86 | 64.82 | 53.98 | 10.84 | 1.15 | -10.04 | QP |
| 2 av | 0.17 | 67.37 | 55.43 | 44.59 | 10.84 | 1.15 | -11.94 | Average |
| 3 | 0.38 | 69.00 | 64.13 | 53.39 | 10.74 | 1.10 | -4.87 | QP |
| 4 | 0.38 | 59.00 | 45.33 | 34.59 | 10.74 | 1.10 | -13.67 | Average |
| 5 | 0.42 | 69.00 | 64.48 | 53.75 | 10.73 | 1.10 | -4.52 | QP |
| 6 | 0.42 | 59.00 | 45.71 | 34.98 | 10.73 | 1.10 | -13.29 | Average |
| 7 pp | 0.48 | 69.00 | 64.61 | 53.89 | 10.72 | 1.10 | -4.39 | QP |
| 8 | 0.48 | 59.00 | 46.70 | 35.98 | 10.72 | 1.10 | -12.30 | Average |
| 9 | 0.66 | 69.00 | 60.42 | 49.59 | 10.83 | 1.20 | -8.58 | QP |
| 10 | 0.66 | 59.00 | 46.79 | 35.96 | 10.83 | 1.20 | -12.21 | Average |
| 11 | 2.36 | 69.00 | 58.88 | 47.85 | 11.03 | 1.38 | -10.12 | QP |
| 12 | 2.36 | 59.00 | 32.72 | 21.69 | 11.03 | 1.38 | -26.28 | Average |

| Remark | |
|---|---|

| **Measurement data** | Port under test | AC mains power input |
|---|---|---|
| Operating mode / voltage / frequency used during the test | | Mode 1/ 120 Vac/ 50 Hz |

**Line**

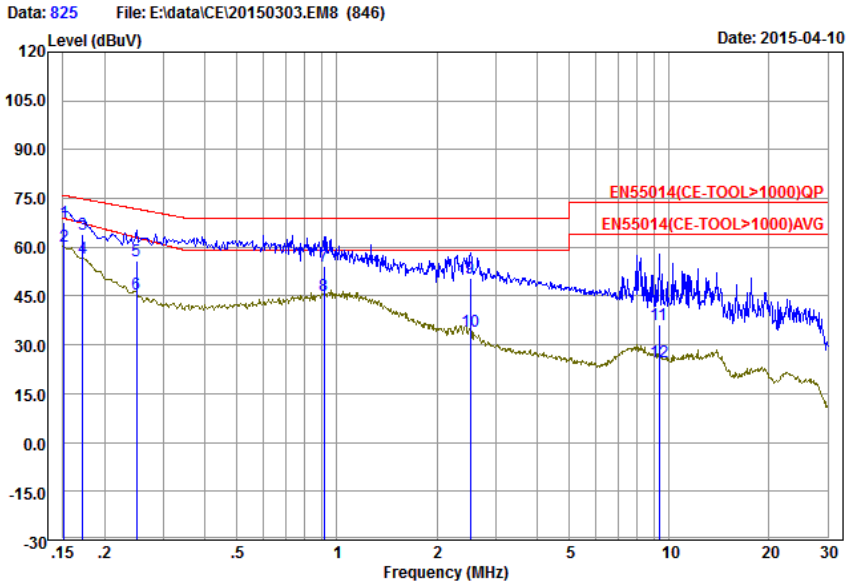



| | Freq | Limit Line | Level | Read Level | Factor | Cable Loss | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dBuV | dBuV | dB | dB | dB | |
| 1 pp | 0.15 | 75.95 | 68.44 | 57.56 | 10.88 | 1.18 | -7.51 | QP |
| 2 av | 0.15 | 68.92 | 60.56 | 49.68 | 10.88 | 1.18 | -8.36 | Average |
| 3 | 0.19 | 74.03 | 60.14 | 49.45 | 10.69 | 1.11 | -13.89 | QP |
| 4 | 0.19 | 66.19 | 52.67 | 41.98 | 10.69 | 1.11 | -13.52 | Average |
| 5 | 0.68 | 69.00 | 55.42 | 44.59 | 10.83 | 1.20 | -13.58 | QP |
| 6 | 0.68 | 59.00 | 45.32 | 34.49 | 10.83 | 1.20 | -13.68 | Average |
| 7 | 1.11 | 69.00 | 55.18 | 44.23 | 10.95 | 1.31 | -13.82 | QP |
| 8 | 1.11 | 59.00 | 47.04 | 36.09 | 10.95 | 1.31 | -11.96 | Average |
| 9 | 2.42 | 69.00 | 51.99 | 40.96 | 11.03 | 1.38 | -17.01 | QP |
| 10 | 2.42 | 59.00 | 36.52 | 25.49 | 11.03 | 1.38 | -22.48 | Average |
| 11 | 13.62 | 74.00 | 35.32 | 23.99 | 11.33 | 1.63 | -38.68 | QP |
| 12 | 13.62 | 64.00 | 25.98 | 14.65 | 11.33 | 1.63 | -38.02 | Average |

| Remark | |
|---|---|

| **Measurement data** | Port under test | AC mains power input |
|---|---|---|
| Operating mode / voltage / frequency used during the test | | Mode 1/ 120 Vac/ 50 Hz |

**Neutral**




| | Freq | Limit Line | Level | Read Level | Factor | Cable Loss | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dBuV | dBuV | dB | dB | dB | |
| 1 pp | 0.15 | 75.96 | 67.58 | 56.69 | 10.89 | 1.18 | -8.38 | QP |
| 2 av | 0.15 | 68.94 | 60.48 | 49.59 | 10.89 | 1.18 | -8.46 | Average |
| 3 | 0.17 | 74.86 | 64.10 | 53.26 | 10.84 | 1.15 | -10.76 | QP |
| 4 | 0.17 | 67.37 | 56.73 | 45.89 | 10.84 | 1.15 | -10.64 | Average |
| 5 | 0.25 | 71.80 | 56.02 | 45.26 | 10.76 | 1.10 | -15.78 | QP |
| 6 | 0.25 | 63.00 | 45.65 | 34.89 | 10.76 | 1.10 | -17.35 | Average |
| 7 | 0.91 | 69.00 | 54.19 | 43.26 | 10.93 | 1.30 | -14.81 | QP |
| 8 | 0.91 | 59.00 | 45.12 | 34.19 | 10.93 | 1.30 | -13.88 | Average |
| 9 | 2.53 | 69.00 | 50.61 | 39.58 | 11.03 | 1.38 | -18.39 | QP |
| 10 | 2.53 | 59.00 | 34.31 | 23.28 | 11.03 | 1.38 | -24.69 | Average |
| 11 | 9.35 | 74.00 | 36.39 | 25.29 | 11.10 | 1.39 | -37.61 | QP |
| 12 | 9.35 | 64.00 | 24.95 | 13.85 | 11.10 | 1.39 | -39.05 | Average |

| Remark | |
|---|---|

| 4.2 **Conducted disturbance voltage– Load terminals** | **VERDICT: N/A** |
|---|---|

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

**Limits**

| Frequency range [MHz] | Limit: QP [dB(µV)[1)]] | Limit: AV [dB(µV) [1)]] | IF BW | Detector(s) |
|---|---|---|---|---|
| 0,15 - 0,50 | 80 | 70 | 9 KHz | QP, CAV |
| 5,0 - 30 | 74 | 64 | 9 KHz | QP, CAV |
| [1)] At the transition frequency, the lower limit applies. | | | | |

**Performed measurements**

| ~~Port(s) / Terminal(s) under test~~ | | | |
|---|---|---|---|
| ☐ | ~~(please write the name of the port under test)~~ | ☐ | ~~Other:~~ |
| ☐ | ~~Other:~~ | ☐ | ~~Other:~~ |

| | | | | |
|---|---|---|---|---|
| ~~Voltage – Mains [V]~~ | ~~(Please write the voltage/voltages used for testing)~~ | | | |
| ~~Frequency – Mains [Hz]~~ | ~~(Please write the frequency/frequencies used for testing)~~ | | | |
| ~~Test method applied~~ | ☐ | ~~Voltage probe~~ | | |
| | ☐ | ~~ISN – Impedance Stabilisation Network~~ | | |
| | ☐ | ~~CDN according to EN / IEC 61000-4-6~~ | | |
| | ☐ | ~~Current probe~~ | | |
| | ☐ | ~~Artificial mains network~~ | | |
| ~~Test setup~~ | ☐ | ~~Table top~~ | ☐ | ~~Artificial hand applied~~ |
| | ☐ | ~~Floor standing~~ | ☐ | ~~Other:~~ |
| | ~~Refer to the Annex 3 for test setup photo(s).~~ | | | |
| ~~Operating mode(s) used~~ | ~~Please write the operating mode(s) used during testing~~ | | | |
| ~~Remark~~ | ~~---~~ | | | |

| 4.3 **Conducted disturbance voltage– Additional terminals** | **VERDICT: N/A** |
|---|---|

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

**Limits**

| Frequency range [MHz] | Limit: QP [dB(µV)[1)]] | Limit: AV [dB(µV) [1)]] | IF BW | Detector(s) |
|---|---|---|---|---|
| 0,15 - 0,50 | 80 | 70 | 9 KHz | QP, CAV |
| 5,0 - 30 | 74 | 64 | 9 KHz | QP, CAV |
| [1)] At the transition frequency, the lower limit applies. | | | | |

**Performed measurements**

| ~~Port(s) / Terminal(s) under test~~ | | | |
|---|---|---|---|
| ☐ | ~~(please write the name of the port under test)~~ | ☐ | ~~Other:~~ |
| ☐ | ~~Other:~~ | ☐ | ~~Other:~~ |

| | | | | |
|---|---|---|---|---|
| ~~Voltage – Mains [V]~~ | ~~(Please write the voltage/voltages used for testing)~~ | | | |
| ~~Frequency – Mains [Hz]~~ | ~~(Please write the frequency/frequencies used for testing)~~ | | | |
| ~~Test method applied~~ | ☐ | ~~CDN according to EN / IEC 61000-4-6~~ | | |
| | ☐ | ~~ISN – Impedance Stabilisation Network~~ | | |
| | ☐ | ~~Voltage probe~~ | | |
| | ☐ | ~~Current probe~~ | | |
| | ☐ | ~~Artificial mains network~~ | | |
| | ☐ | ~~Other:~~ | | |
| ~~Test setup~~ | ☐ | ~~Table top~~ | ☐ | ~~Artificial hand applied~~ |
| | ☐ | ~~Floor standing~~ | ☐ | ~~Other:~~ |
| | ~~Refer to the Annex 3 for test setup photo(s).~~ | | | |
| ~~Operating mode(s) used~~ | ~~Please write the operating mode(s) used during testing~~ | | | |
| ~~Remark~~ | ~~—~~ | | | |

| 4.4 **Disturbance power (30 MHz – 300 MHz)** | **VERDICT: PASS** |
|---|---|

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

**Limits – Tools**

| 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. | | | | |

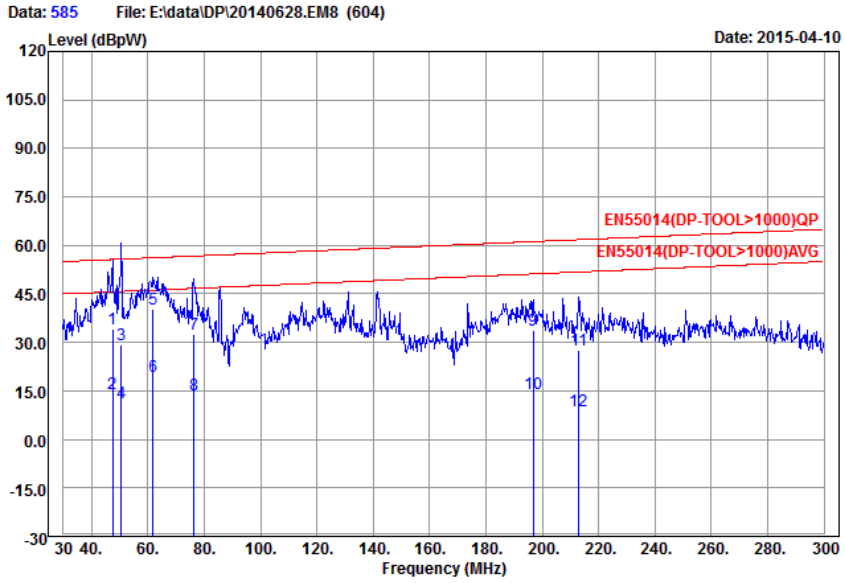
| | | |
|---|---|---|
| ☐ | Rated power below 700 W | Limits as above |
| ☐ | Rated power between 700 and 1000 W | Limits +4 dB |
| ☒ | Rated power above 1000 W | Limits +10 dB |

**Performed measurements**

| Port(s) under test | | | | | |
|---|---|---|---|---|---|
| ☒ | AC mains input power | ☐ | Load | ☐ | Control |
| ☐ | Other: | ☐ | Other: | ☐ | Other: |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Scan range (0,9 – 1,1 $U_N$) | ☐ | 198 – 264 $V_{AC}$ | ☐ | 207 – 253 $V_{AC}$ | ☒ | 230/120 $V_{AC}$ | |
| Voltage – Mains [V] | 230/120 Vac | | | | | | |
| Frequency – Mains [Hz] | 50 Hz | | | | | | |
| Test setup | ☒ | Table top | ☐ | Floor standing | | | |
| | ☐ | Other: | | | | | |
| | Refer to the Annex 3 for test setup photo(s). | | | | | | |
| Conditions for exemption from measurements above 300 MHz | ☒ | “Limits” reduced by “Margin” applied and passed | | | | | |
| | ☐ | Maximum clock frequency < 30 MHz | | | | | |
| Operating mode(s) used | Mode 1 | | | | | | |
| Remark | --- | | | | | | |

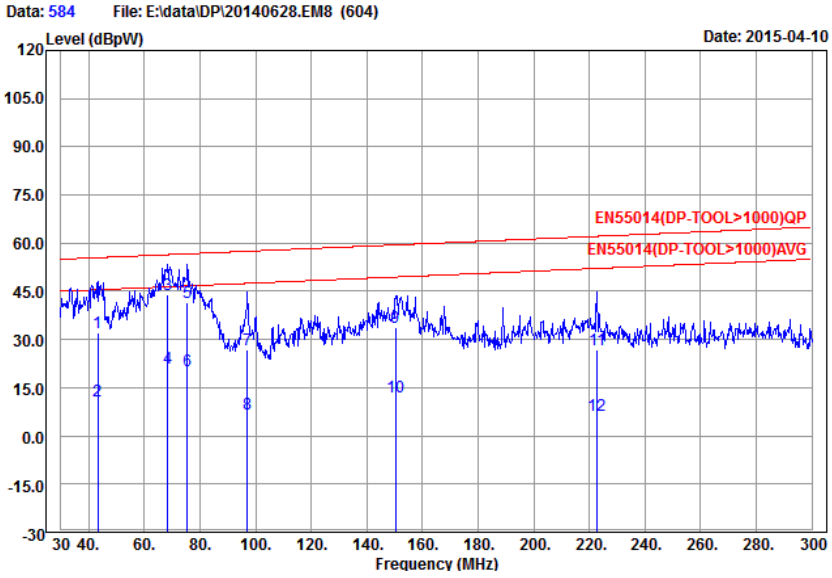
| **Measurement data** | Port under test | AC mains power input |
|---|---|---|
| Operating mode / voltage / frequency used during the test | | Mode 1/ 230 Vac/ 50 Hz |




| | | Freq | Limit Line | Level | Read Level | Factor | Cable Loss | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBpW | dBpW | dBpW | dB | dB | dB | |
| 1 | | 47.55 | 55.66 | 33.98 | 14.27 | 19.71 | 0.83 | -21.68 | QP |
| 2 | | 47.55 | 45.66 | 14.01 | -5.70 | 19.71 | 0.83 | -31.65 | Average |
| 3 | | 50.52 | 55.77 | 29.23 | 9.60 | 19.63 | 1.00 | -26.54 | QP |
| 4 | | 50.52 | 45.77 | 11.23 | -8.40 | 19.63 | 1.00 | -34.54 | Average |
| 5 | pp | 61.86 | 56.19 | 40.20 | 21.57 | 18.63 | 1.17 | -15.99 | QP |
| 6 | av | 61.86 | 46.19 | 19.33 | 0.70 | 18.63 | 1.17 | -26.86 | Average |
| 7 | | 76.44 | 56.73 | 32.53 | 13.87 | 18.66 | 1.29 | -24.20 | QP |
| 8 | | 76.44 | 46.73 | 13.56 | -5.10 | 18.66 | 1.29 | -33.17 | Average |
| 9 | | 196.86 | 61.19 | 33.61 | 14.79 | 18.82 | 2.22 | -27.58 | QP |
| 10 | | 196.86 | 51.19 | 14.08 | -4.74 | 18.82 | 2.22 | -37.11 | Average |
| 11 | | 213.06 | 61.79 | 27.81 | 9.27 | 18.54 | 1.97 | -33.98 | QP |
| 12 | | 213.06 | 51.79 | 8.80 | -9.74 | 18.54 | 1.97 | -42.99 | Average |

| Remark | |
|---|---|

| **Measurement data** | Port under test | AC mains power input |
|---|---|---|
| Operating mode / voltage / frequency used during the test | | Mode 1/ 120 Vac/ 50 Hz |




| | Freq | Limit Line | Level | Read Level | Factor | Cable Loss | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBpW | dBpW | dBpW | dB | dB | dB | |
| 1 | 43.23 | 55.50 | 32.04 | 11.98 | 20.06 | 0.84 | -23.46 | QP |
| 2 | 43.23 | 45.50 | 10.97 | -9.09 | 20.06 | 0.84 | -34.53 | Average |
| 3 pp | 68.34 | 56.43 | 43.79 | 25.27 | 18.52 | 1.19 | -12.64 | QP |
| 4 av | 68.34 | 46.43 | 21.12 | 2.60 | 18.52 | 1.19 | -25.31 | Average |
| 5 | 75.36 | 56.69 | 41.49 | 22.89 | 18.60 | 1.24 | -15.20 | QP |
| 6 | 75.36 | 46.69 | 20.19 | 1.59 | 18.60 | 1.24 | -26.50 | Average |
| 7 | 96.96 | 57.49 | 26.66 | 8.70 | 17.96 | 1.40 | -30.83 | QP |
| 8 | 96.96 | 47.49 | 6.93 | -11.03 | 17.96 | 1.40 | -40.56 | Average |
| 9 | 150.42 | 59.47 | 33.56 | 15.27 | 18.29 | 1.73 | -25.91 | QP |
| 10 | 150.42 | 49.47 | 12.15 | -6.14 | 18.29 | 1.73 | -37.32 | Average |

| Remark | |
|---|---|

| 4.5 **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 | Limit: QP [dB(μV/m)[1)]] | | | IF BW | Detector |
|---|---|---|---|---|---|
| [MHz] | @3 m. | @5 m. | @10 m. | | |
| 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~~ | ~~Enclosure~~ | |
| ~~Voltage – Mains [V]~~ | ~~(Please write the voltage/voltages used for testing)~~ | |
| ~~Frequency – Mains [Hz]~~ | ~~(Please write the frequency/frequencies used for testing)~~ | |
| | | |
| ~~Test method applied~~ | ☒ | ~~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~~ | ☒ | ~~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~~ | ~~Please write the operating mode(s) used during testing~~ | |
| ~~Remark~~ | ~~---~~ | |

| 4.6 **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**

| ~~Scan range (0,9 - 1,1 $U_N$)~~ | ☒ | ~~198 – 264 $V_{AC}$~~ | ☐ | ~~207 – 253 $V_{AC}$~~ | ☐ | ~~– $V_{AC}$~~ |
|---|---|---|---|---|---|---|
| ~~Voltage – Mains [V]~~ | ~~264 Vac~~ | | | | | |
| ~~Frequency – Mains [Hz]~~ | ~~50 Hz~~ | | | | | |
| | | | | | | |
| ~~Test method applied~~ | ☒ | ~~Artificial mains network~~ | | | | |
| | ☐ | ~~Voltage probe~~ | | | | |
| ~~Test setup~~ | ☒ | ~~Table top~~ | ☐ | ~~Floor standing~~ | | |
| | ☐ | ~~Other:~~ | | | | |
| | | | | | | |
| ~~Operating mode(s) used~~ | ~~Mode 1~~ | | | | | |
| ~~Remark~~ | ~~---~~ | | | | | |

| ~~Reason for not performing the test~~ | ☒ | ~~The amplitudes of the observed disturbances were all below the limit for continuous disturbance, these are not considered to be clicks.~~ | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| ~~Measurement results~~ | ☒ | ~~Neutral~~ | ☒ | ~~Line 1~~ | ☐ | ~~Line 2~~ | ☐ | ~~Line 3~~ | |

| ~~Frequency (MHz)~~ | ~~First Measurement: Determination of the limit $L_q$ – Quasi-peak~~ | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ~~Limit $L$ (dBµV)~~ | ~~Number of short clicks~~ | ~~Number of long clicks~~ | ~~Number of clicks – $N_1$~~ | ~~Time of meas. (min.)~~ | ~~Click rate $N$~~ | ~~Increased limit (dB)~~ | ~~Increased Limit $L_q$~~ |
| ~~0,15~~ | ~~66~~ | ~~0~~ | ~~0~~ | ~~0~~ | ~~2~~ | | | |
| ~~0,5~~ | ~~56~~ | ~~0~~ | ~~0~~ | ~~0~~ | ~~2~~ | | | |
| ~~1,4~~ | ~~56~~ | ~~0~~ | ~~0~~ | ~~0~~ | ~~2~~ | | | |
| ~~30~~ | ~~60~~ | ~~0~~ | ~~0~~ | ~~0~~ | ~~2~~ | | | |

| ☐ | ~~The calculated click rate N is not more than 5 times per minute and all the clicks are classified as short (t ≤ 10 ms). Thus, the EUT is deemed to comply with the limits without any further measurement at an increased limit.~~ |
|---|---|

| ~~Frequency (MHz)~~ | ~~Second measurement with Limit = $L_q$ (Upper quartile method):~~ | | | |
|---|---|---|---|---|
| | ~~Limit Lq (dBµV)~~ | ~~Number of clicks – $N_2$~~ | ~~Number of authorized clicks N2 ≤N1/4~~ | ~~Verdict~~ |
| ~~0,15~~ | | | | |
| ~~0,5~~ | | | | |
| ~~1,4~~ | | | | |
| ~~30~~ | | | | |

~~Supplementary information: ---~~

## 4.7 Harmonic current emissions — VERDICT: PASS

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

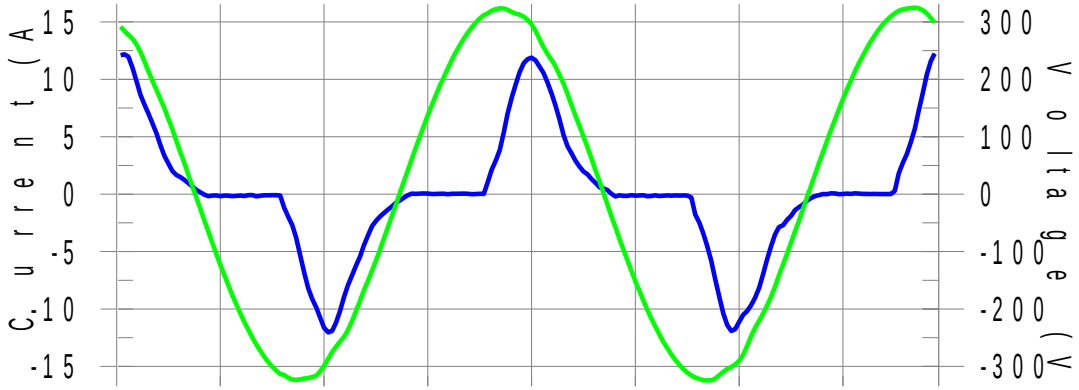
| Classification | | | |
|---|---|---|---|
| ☐ | Class A | All apparatus not classified as Class B, C or D | |
| ☒ | Class B | Portable tools | |
| ☐ | Class C | ☐ | Lighting equipment with active input power > 25 W |
| | | ☐ | Lighting equipment with active input power ≤ 25 W<br>(First requirement, Table 3 column 2) |
| | | ☐ | Lighting equipment with active input power ≤ 25 W (Second requirement) |
| ☐ | Class D | Personal computers, television receivers | |

**Performed measurements**

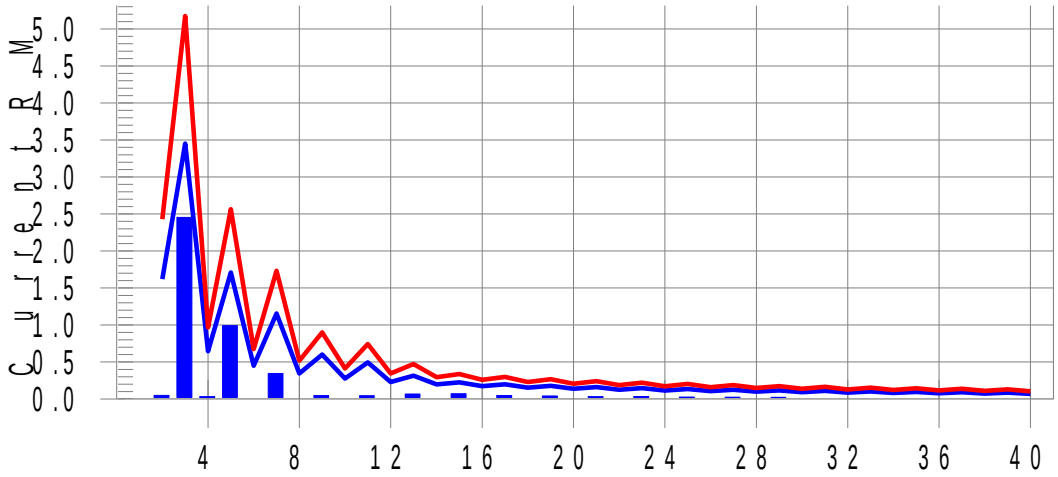
| Port under test | AC mains power input | | | | | |
|---|---|---|---|---|---|---|
| Voltage – Mains [V] | 230 Vac | | | | | |
| Frequency – Mains [Hz] | 50 Hz | | | | | |
| | | | | | | |
| Observation peroid | ☐ | 6.5 min. | ☒ | 2.5 min. | ☐ | Other: |
| Version of measurement instrument standard used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

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

**Current & voltage waveforms**




**Harmonics and Class B limit line European Limits**




**Test result: Pass Worst harmonic was #3 with 71.1% of the limit.**

| **Measurement data** | Port under test | AC mains power input |
|---|---|---|

**Test Result: Pass** **Source qualification: Normal**

**THC(A): 2.673** **I-THD(%): 66.4** **POHC(A): 0.046** **POHC Limit(A): 0.377**
**Highest parameter values during test:**

| | | | |
|---|---|---|---|
| **V_RMS (Volts):** | **229.73** | **Frequency(Hz):** | **50.00** |
| **I_Peak (Amps):** | **12.485** | **I_RMS (Amps):** | **5.369** |
| **I_Fund (Amps):** | **4.510** | **Crest Factor:** | **2.434** |
| **Power (Watts):** | **898.5** | **Power Factor:** | **0.734** |

| Harm# | Harms(avg) | 100%Limit | %of Limit | Harms(max) | 150%Limit | %of Limit | Status |
|---|---|---|---|---|---|---|---|
| 2 | 0.050 | 1.620 | 3.1 | 0.060 | 2.430 | 2.5 | Pass |
| 3 | 2.453 | 3.450 | 71.1 | 2.657 | 5.175 | 51.3 | Pass |
| 4 | 0.032 | 0.645 | 5.0 | 0.036 | 0.968 | 3.7 | Pass |
| 5 | 0.991 | 1.710 | 57.9 | 1.013 | 2.565 | 39.5 | Pass |
| 6 | 0.019 | 0.450 | N/A | 0.022 | 0.675 | N/A | Pass |
| 7 | 0.345 | 1.155 | 29.9 | 0.360 | 1.733 | 20.8 | Pass |
| 8 | 0.011 | 0.345 | N/A | 0.012 | 0.518 | N/A | Pass |
| 9 | 0.046 | 0.600 | 7.7 | 0.052 | 0.900 | 5.7 | Pass |
| 10 | 0.008 | 0.276 | N/A | 0.011 | 0.414 | N/A | Pass |
| 11 | 0.044 | 0.495 | 8.9 | 0.047 | 0.743 | 6.4 | Pass |
| 12 | 0.010 | 0.230 | N/A | 0.012 | 0.345 | N/A | Pass |
| 13 | 0.068 | 0.315 | 21.6 | 0.073 | 0.473 | 15.5 | Pass |
| 14 | 0.015 | 0.197 | N/A | 0.017 | 0.295 | N/A | Pass |
| 15 | 0.072 | 0.225 | 31.8 | 0.084 | 0.338 | 24.8 | Pass |
| 16 | 0.014 | 0.173 | N/A | 0.016 | 0.260 | N/A | Pass |
| 17 | 0.048 | 0.199 | 24.2 | 0.052 | 0.299 | 17.5 | Pass |
| 18 | 0.011 | 0.153 | N/A | 0.016 | 0.230 | N/A | Pass |
| 19 | 0.042 | 0.178 | 23.4 | 0.049 | 0.267 | 18.3 | Pass |
| 20 | 0.010 | 0.138 | N/A | 0.012 | 0.207 | N/A | Pass |
| 21 | 0.032 | 0.161 | 19.8 | 0.037 | 0.241 | 15.2 | Pass |
| 22 | 0.011 | 0.125 | N/A | 0.013 | 0.188 | N/A | Pass |
| 23 | 0.033 | 0.147 | 22.8 | 0.036 | 0.221 | 16.3 | Pass |
| 24 | 0.009 | 0.115 | N/A | 0.014 | 0.173 | N/A | Pass |
| 25 | 0.026 | 0.135 | N/A | 0.034 | 0.203 | N/A | Pass |
| 26 | 0.011 | 0.106 | N/A | 0.014 | 0.159 | N/A | Pass |
| 27 | 0.025 | 0.125 | N/A | 0.028 | 0.188 | N/A | Pass |
| 28 | 0.008 | 0.099 | N/A | 0.010 | 0.149 | N/A | Pass |
| 29 | 0.023 | 0.116 | N/A | 0.025 | 0.174 | N/A | Pass |
| 30 | 0.007 | 0.092 | N/A | 0.009 | 0.138 | N/A | Pass |
| 31 | 0.018 | 0.110 | N/A | 0.022 | 0.164 | N/A | Pass |
| 32 | 0.006 | 0.086 | N/A | 0.008 | 0.129 | N/A | Pass |
| 33 | 0.018 | 0.102 | N/A | 0.019 | 0.153 | N/A | Pass |
| 34 | 0.006 | 0.081 | N/A | 0.007 | 0.122 | N/A | Pass |
| 35 | 0.015 | 0.096 | N/A | 0.017 | 0.144 | N/A | Pass |
| 36 | 0.006 | 0.077 | N/A | 0.007 | 0.116 | N/A | Pass |
| 37 | 0.014 | 0.092 | N/A | 0.016 | 0.137 | N/A | Pass |
| 38 | 0.006 | 0.073 | N/A | 0.006 | 0.110 | N/A | Pass |
| 39 | 0.012 | 0.087 | N/A | 0.014 | 0.131 | N/A | Pass |
| 40 | 0.005 | 0.069 | N/A | 0.006 | 0.104 | N/A | Pass |

| Remark | |
|---|---|

| 4.8 **Voltage changes, voltage fluctuations and flicker** | **VERDICT: PASS** |
|---|---|

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

**Limits**

| | | | | |
|---|---|---|---|---|
| $P_{ST}$ (Short term flicker) | ☐ | ≤ 1 | ☒ | Not Applicable |
| $P_{LT}$ (Long term flicker) | ☐ | ≤ 0,65 | ☒ | Not Applicable |
| $d_C$ (Relative Voltage change) | ☒ | ≤ 3,3% | ☐ | Not Applicable |
| $d_{MAX}$ (Max. voltage change) | ☐ | ≤ 4% | ☐ | 6% |
| | ☒ | 7% | ☐ | Not Applicable |
| 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 Mains power input | | | | | |
| Voltage – Mains [V] | 230 Vac | | | | | |
| Frequency – Mains [Hz] | 50 Hz | | | | | |
| Test method | ☒ | Flickermeter according EN / IEC 61000-4-15:2011 | | | | |
| | ☐ | Simulation (Clause 4.2.3 of EN / IEC 61000-3-3) | | | | |
| | ☐ | Analytical method (Clause 4.2.4 of EN / IEC 61000-3-3) | | | | |
| | ☐ | Use of $P_{st}$ = 1 curve (Clause 4.2.5 of EN / IEC 61000-3-3) | | | | |
| Observation peroid | ☐ | 10 min. | ☐ | 120 min. | ☐ | Other: |
| | ☒ | 24 times switching according to Annex B | | | | |
| Operating mode(s) used | Mode 1 | | | | | |
| Remark | --- | | | | | |

See next page.

| **Measurement data** | Port under test | AC mains power input |
|---|---|---|
| Operating mode used during the test | Mode1/ 230 Vac/ 50 Hz | |

| | |
|---|---|
| Relative voltage change characteristic dt | 0,0 ms |
| Maximum voltage change $d_{MAX}$ | 1,734% |
| Relative Voltage change $d_C$ | 0,810% |
| Short term flicker $P_{ST}$ | N/A |
| Long term flicker $P_{LT}$ | N/A |

| Remark | |
|---|---|

# 5 IMMUNITY TEST RESULTS

## 5.1 Performance (Compliance) criteria

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

Performance criteria A : The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer then either of these may be derived from the product description and documentation and from what the user may reasonably expect from the apparatus if used as intended.

Performance criteria B : The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level ( or permissible loss of performance) specified by the manufacturer when the apparatus is used as intended. During the test, degradation of performance is allowed however no change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer then either of these may be derived from the product description and documentation and from what the user may reasonable expect from the apparatus if used as intended.

Performance criteria C : Temporary loss of function is allowed provided the function is self- recoverable or can be restored by the operation of the controls or by any operation specified in the instruction for use.

### 5.1.1 Performance criteria related to immunity tests

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

### 5.1.2 Manufacturer defined performance criteria

Not provided.

## 5.2 Monitored – Checked Functions / Parameters

During the immunity tests the following functions of the EUT has/have been monitored/checked.

| | | | |
|---|---|---|---|
| ☒ | Motor speed | ☐ | Display data |
| ☐ | Switching | ☐ | Data storage |
| ☐ | Standby mode | ☐ | Sensor functions |
| ☐ | Temperature | ☐ | Audible signals |
| ☐ | Power consumption | ☐ | Others : LED's |
| ☐ | AC mains input current | ☐ | Others : |
| ☐ | Timing | ☐ | Others : |
| ☐ | Illumination | ☐ | Others : |
| Supplementary information : | | | |

| **Immunity test** | **Monitored - Checked function(s)/parameter(s) during / after the test** | **Method** |
|---|---|---|
| Electrostatic discharge | PASS | --- |
| Radio-frequency electromagnetic fields | N/A | --- |
| Fast transients | PASS | --- |
| Surge transient | PASS | --- |
| Injected currents (radio-frequency common mode) | PASS | --- |
| Voltage dips and short interruptions | PASS | --- |
| Supplementary information : | | |

## 5.3 Electrostatic discharge immunity — VERDICT: PASS

Electrostatic discharges (ESD) are the result of persons or objects that accumulate static electricity due to for instance walking on synthetic carpets. The ESD can influence the operation of equipment or damage its electronics, either by a direct discharge or indirectly by coupling or radiation. Both effects are simulated during the tests.

**Requirements**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Standard | EN 55014-2 | | | | | | | |
| Basic standard | EN 61000-4-2 | | | | | | | |
| Port under test | Enclosure | | | | | | | |
| Air discharges [1)] | ☐ | ±2 kV | ☐ | ±4 kV | ☒ | ±8 kV | ☐ | kV |
| Contact discharges [1)] | ☐ | ±2 kV | ☒ | ±4 kV | ☐ | ±8 kV | ☐ | kV |
| Number of discharges | ≥ 10 per polarity with ≥ 1 sec interval. | | | | | | | |
| [1)] Tests with lower voltages are not required. | | | | | | | | |

**Performed tests**

| | | | | | |
|---|---|---|---|---|---|
| Set-up | ☒ | Table-top | ☐ | Floor standing | |
| Ambient temperature [°C] | 23 °C | | | Relative Humidity air [%] | 46.1% |
| | | | | | |
| Voltage – Mains [V] | 230 Vac | | | | |
| Frequency – Mains [Hz] | 50 Hz | | | | |
| | | | | | |
| Operating mode(s) used | Mode 1 | | | | |

| | Test Point | Test Voltage [kV] & Polarity | Coupling type | # of applied discharges / polarity | Discharge interval [s] |
|---|---|---|---|---|---|
| ☒ | Points on conductive surface as indicated in the picture below. | ±4 | Contact | 10 | 1 |
| ☒ | Points on non-conductive surface as indicated in the picture below. | ±8 | Air | 10 | 1 |
| ☒ | HCP top side. | ±4 | Contact | 10 | 1 |
| ☒ | HCP bottom side. | ±4 | Contact | 10 | 1 |
| ☒ | VCP right side. | ±4 | Contact | 10 | 1 |
| ☒ | VCP left side. | ±4 | Contact | 10 | 1 |
| ☒ | VCP front side. | ±4 | Contact | 10 | 1 |
| ☒ | VCP rear side. | ±4 | Contact | 10 | 1 |
| | | | | | |
| Observation(s) | During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance or data was observed. | | | | |
| Supplementary information: | | | | | |

| 5.4 | **Radio-frequency electromagnetic fields immunity** | **VERDICT: N/A** |
|---|---|---|

During the test it is verified if the equipment under test (EUT) has sufficient immunity against radiated electromagnetic fields. Industrial electromagnetic sources, walkie-talkies, radio transmitters, television transmitters and telecommunication equipment including cellular telephones and other emitting devices can generate these fields.

**Requirements**

| Standard | EN 55014-2 | | | |
|---|---|---|---|---|
| Basic standard | EN 61000-4-3 | | | |
| Port under test | Enclosure | | | |
| Frequency range | Test level | Modulation | Dwell time | Step size |
| 80 – 1000 MHz | 3 V/m | 80% AM (1kHz) | ≥ 0,5 s | ≤ 1% |
| Supplementary information: | | | | |

**Performed tests**

| ~~Test method~~ | ☒ | ~~EN 61000-4-3~~ | ☐ | ~~EN 61000-4-20~~ |
|---|---|---|---|---|
| ~~Test set-up~~ | ☒ | ~~Equipment on the table (0,8 m height)~~ | | |
| | ☐ | ~~Equipment standing on floor (0,05 – 0,15 m height)~~ | | |

| ~~Voltage – Mains [V]~~ | ~~230 Vac~~ |
|---|---|
| ~~Frequency – Mains [Hz]~~ | ~~50 Hz~~ |
| ~~Operating mode(s) used~~ | ~~Mode 1~~ |

| ~~Frequency range (applied)~~ | ~~Antenna Polarization~~ | ~~Test level (applied)~~ | ~~Modulation (applied)~~ | ~~Dwell time (applied)~~ | ~~Remark~~ |
|---|---|---|---|---|---|
| ~~80 – 1000 MHz~~ | ~~H~~ | ~~3 V/m~~ | ~~80% AM (1kHz)~~ | ~~3 s~~ | |
| ~~(step size 1%)~~ | ~~V~~ | ~~3 V/m~~ | ~~80% AM (1kHz)~~ | ~~3 s~~ | |

| ~~Exposed side of the EUT~~ | ☒ | ~~Front (0°)~~ | ☒ | ~~Right (90°)~~ | ☐ | ~~Top~~ |
|---|---|---|---|---|---|---|
| | ☒ | ~~Rear (180°)~~ | ☒ | ~~Left (270°)~~ | ☐ | ~~Bottom~~ |

| ~~Observation(s)~~ | ~~During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance was observed.~~ |
|---|---|
| ~~Supplementary information:~~ | |

| 5.5 | **Electrical Fast Transients immunity** | **VERDICT: PASS** |
|---|---|---|

The EFT immunity test simulates disturbances by bursts of very short transients caused for example by switching off loads such as an AC motor or bouncing relay contacts. The transients are likely to disturb electronics but less likely to cause damage.

**Requirements**

| Standard | | EN 55014-2 | | |
|---|---|---|---|---|
| Basic standard | | EN 61000-4-4 | | |
| Pulse characteristics | | 5/50 ns | | |
| Port | | Test level | Repetition frequency | Duration |
| ☒ | AC input-output power [1)] | ± 1000 V | 5 KHz | 2 min. / polarity |
| ☐ | DC input-output power [2)] | ± 500 V | 5 KHz | 2 min. / polarity |
| ☐ | Signal and Control lines [3)] | ± 500 V | 5 KHz | 2 min. / polarity |

[1)] For extra low voltage a.c ports, this testing is only applicable to ports interfacing with cables whose total length may exceed 3 m according to the manufacturer's functional specification.

[2)] Not applicable to battery operated appliances that cannot be connected to the mains while in use.

[3)] Applicable only to ports interfacing with cables whose total length may exceed 3 m according to the manufacturer's functional specification.

**Performed tests**

| Voltage – Mains [V] | 230 Vac | | | |
|---|---|---|---|---|
| Frequency – Mains [Hz] | 50 Hz | | | |
| Operating mode(s) used | Mode 1 | | | |
| Test Set-up | ☒ | Equipment standing on floor at (0,1 ± 0,01) m above ground plane | | |
| | ☐ | Equipment on the table (0,1 ± 0,01) m above ground plane | | |
| | ☐ | Artificial hand applied. | | |
| Coupling | ☒ | Common mode | ☐ | Other: |

| Port(s) under test | Test Voltage &Polarity | Repetition Frequency | Test duration / polarity | Injection method | | | |
|---|---|---|---|---|---|---|---|
| AC / DC mains power input | 1 kV | 5 KHz | 2 min | ☒ | CDN | ☐ | Clamp |
| AC / DC power output | | 5 KHz | | ☐ | CDN | ☐ | Clamp |
| Ethernet / LAN | | 5 KHz | | ☐ | CDN | ☐ | Clamp |
| Observation(s) | During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance was observed. | | | | | | |

| 5.6 **Surge transient immunity** | **VERDICT: PASS** |
|---|---|

The surge transient immunity test simulates the surges that are caused by over-voltages due to indirect (induced) lightning transients. The pulse is a slow transient with high-energy contents and due to its long duration may cause damage to an unprotected EUT.

**Requirements**

| Standard | EN 55014-2 | | |
|---|---|---|---|
| Basic standard | EN 61000-4-5 | | |
| Pulse characteristics | 1,2/50µs Voltage; 8/20µs Current | | |
| Repetition rate | ≥ 60 secs. (for each test level and phase angle) | | |
| Number of pulses | 5 pulses (at each polarity and phase angle) | | |
| Port | Test level & Polarity & Coupling | | Phase angle [º] |
| | Line to Line | Line to Earth | |
| AC input power [1)] | + 1 kV | N/A | 90 |
| AC input power [1)] | - 1 kV | N/A | 270 |
| [1)] Tests with lower voltages are not required. | | | |

**Performed tests**

| Voltage – Mains [V] | 230 Vac |
|---|---|
| Frequency – Mains [Hz] | 50 Hz |
| Operating mode(s) used | Mode 1 |
| | |
| Repetition rate | 60 secs. (for each test level and phase angle) |
| Number of pulses | 5 pulses (at each polarity and phase angle) |

| Port(s) under test | | Coupling | Test level & Polarity | Phase angle [º] | Remark |
|---|---|---|---|---|---|
| ☒ | AC mains input power | Line to Neutral | +1 kV | 90 | |
| ☒ | AC mains input power | Line to Neutral | -1 kV | 270 | |
| ☐ | AC mains input power | Line to Earth | +2 kV | 90 | 1 |
| ☐ | AC mains input power | Line to Earth | -2 kV | 270 | 1 |
| ☐ | AC mains input power | Neutral to Earth | +2 kV | 90 | 1 |
| ☐ | AC mains input power | Neutral to Earth | -2 kV | 270 | 1 |
| | | | | | |
| Observation(s) | | During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance or data was observed. | | | |
| Supplementary information:<br>1. The EUT does not include an earth port. | | | | | |

| 5.7 | **Injected currents (RF common mode) immunity** | **VERDICT: PASS** |
|---|---|---|

During this test the immunity of the equipment for induced or conducted electromagnetic fields is checked. Fields generated by radio and other transmitters cause RF voltages in long cables like the mains network. This test reproduces these induced disturbing voltages by injecting them to the EUT via the cabling.

**Requirements**

| Standard | | EN 55014-2 | | |
|---|---|---|---|---|
| Basic standard | | EN 61000-4-6 | | |
| Frequency range | | Modulation | Step size | Dwell time |
| ☐ | 0,15 – 80 MHz | 80% AM (1kHz) | ≤ 1% | ≥ 0,5 s |
| ☒ | 0,15 – 230 MHz | 80% AM (1kHz) | ≤ 1% | ≥ 0,5 s |
| Port | | | Test level, *Uo* | |
| ☒ | AC input-output power [1] | | 3 V | |
| ☐ | DC input-output power [2] [3] | | 1 V | |
| ☐ | Signal and Control lines [4] | | 1 V | |

[1] For extra low voltage a.c ports, this testing is only applicable to ports interfacing with cables whose total length may exceed 3 m according to the manufacturer's functional specification.

[2] Not applicable to battery operated appliances that cannot be connected to the mains while in use.

[3] Applicable to battery operated appliances that can be connected to the mains while in use, or to appliances for which the length of d.c. cables may exceed 3 m according to the manufacturer's functional specification.

[4] Applicable only to ports interfacing with cables whose total length may exceed 3 m according to the manufacturer's functional specification.

**Performed tests**

| Frequency range (applied) | | | | Modulation (applied) | Step size (applied) |
|---|---|---|---|---|---|
| ☐ | 0,15 – 80 MHz | ☒ | 0,15 – 230 MHz | 80% AM (1kHz) | 1% |
| Voltage – Mains [V] | | 230 Vac | | Frequency – Mains [Hz] | 50 Hz |
| Operating mode(s) used | | Mode 1 | | | |
| Test set-up | | ☐ | Equipment standing on floor at (0,1 ± 0,01) m above ground plane. | | |
| | | ☐ | Equipment on the table (0,1 ± 0,01) m above ground plane. | | |
| | | ☒ | Artificial hand applied. | | |

| Port(s) under test | Test Level (applied) | Injection method | Dwell time (applied) | Remark |
|---|---|---|---|---|
| AC mains power input | 3 V | CDN-M2 | 3 s | |
| | | | | |
| Observation(s) | During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance or data was observed. | | | |
| Supplementary information: | | | | |

## 5.8 Power supply interruptions and dips immunity — VERDICT: PASS

The purpose of the test is to verify the immunity of the equipment against voltage dips and voltage interruptions. It helps to ensure that the equipment functions properly (as expected and safely) with power supply fluctuations. Voltage dips and interruptions are caused by faults in the LV, MV, HV networks (short-circuit or ground faults).

**Requirements**

| Standard | EN 55014-2 | | | |
|---|---|---|---|---|
| Basic standard | EN 61000-4-11 | | | |
| # of dips & interruptions | 3 dips / interruptions for each test level and phase angle | | | |
| Interval between events | ≥ 10 seconds | | | |
| Port | Test level [1)] | Period (Cycles) | | Performance Criteria |
| | | 50 Hz | 60 Hz | |
| AC input power port | $U_{NOM}$ – 100% | 0,5 | 0,5 | C; Refer to the chapter 5.1 for details. |
| AC input power port | $U_{NOM}$ – 60% | 10 | 12 | C; Refer to the chapter 5.1 for details. |
| AC input power port | $U_{NOM}$ – 30% | 25 | 30 | C; Refer to the chapter 5.1 for details. |

[1)] Changes to the voltage level shall occur at a zero crossing point in the a.c. voltage waveform.

NOTE: Where the equipment has a rated voltage range the following shall apply:
- If the voltage range does not exceed 20% of the lower voltage specified for the rated voltage range. A single voltage within that range may be selected for testing.
- In all other cases, the test procedure shall be applied for both the lowest and highest voltages declared in the voltage range.

**Performed tests**

| $U_{NOM}$ [$V_{AC}$] | Terminal | Voltage dip [% $U_{NOM}$] | Duration [cycles] | | Repetion rate [s] | Number of dips per test | Phase angle [°] |
|---|---|---|---|---|---|---|---|
| | | | 50 Hz | 60 Hz | | | |
| 230 | L-N | 0 | 0,5 | / | 10 | 3 | 0, 180 |
| 230 | L-N | 40 | 10 | / | 10 | 3 | 0, 180 |
| 230 | L-N | 70 | 25 | / | 10 | 3 | 0, 180 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

| Operating mode(s) used | Mode 1 |
|---|---|
| Observation(s) | During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance was observed. |

Supplementary information:

# 6 IDENTIFICATION OF THE EQUIPMENT UNDER TEST

## EUT PHOTOS

# 7 MEASUREMENT UNCERTAINTIES

The table(s) below show(s) measurment uncertainties of the EMC test set-ups. 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%.

DEKRA SHANGHAI

| **Emission tests** | | **Uncertainty** | **Ucispr** |
|---|---|---|---|
| Conducted disturbance (mains port), 9 kHz – 30MHz | | 3,08 dB | 3,83 dB |
| Conducted disturbance using an AAN, 150kHz – 30MHz | | 4,04 dB<br>4,44 dB | 4,20 dB<br>4,59 dB |
| Conducted disturbance using a VP, 150kHz – 30MHz | | 1,82 dB | 2,91 dB |
| Conducted disturbance using a CVP, 150kHz – 30MHz | | 3,44 dB | 3,85 dB |
| Conducted disturbance using a CP, 150kHz – 30MHz | | 2,06 dB | 2,89 dB |
| CDNE, 30MHz – 300MHz | | 3,34 dB | 3,79 dB |
| Disturbance power, 30 MHz – 300 MHz | | 3,76 dB | 4,52 dB |
| Radiated electromagnetic disturbances, (9 KHz – 30 MHz) | | 2,62 dB | 3,3 dB |
| Radiated emissions; (Horz.) | 30 MHz – 300 MHz | 3,60 dB | 5,34 dB |
| | 300 MHz – 1000 MHz | 3,10 dB | |
| Radiated emissions; (Vert.) | 30 MHz –300 MHz | 3,20 dB | 6,32 dB |
| | 300 MHz – 1000 MHz | 3,20 dB | |
| LF harmonic current emissions | | 0,2% | na |
| LF voltage fluctuations | | 2,5% | na |
| EMF | | 2,02 dB | na |

| **Immunity tests** | **Uncertainty** |
|---|---|
| Electrostatic discharge | $U_{peak}$=6%, $U_{30ns}$=6%, $U_{60ns}$=6%, $U_{rt}$=13% |
| Radio-frequency electromagnetic fields | 1,48 dB |
| Fast transients | $U_{tr}$=6,2%, $U_{pw}$=3%, $U_{bp}$=3%, $U_{bd}$=3% |
| Surges | $U_{peak}$=3,3%, $U_{ft}$=3%, $U_{dt}$=3% |
| Injected currents (radio-frequency common mode) | 1,71 dB |
| Voltage dips and short interruptions | $U_{out}$=0,4%, $U_{f}$=3%, $U_{r-d}$=3% |

# 8 USED EQUIPMENT

Conducted Emission

| Equipment | Manufacturer | Model No. | Serial No. | Cal. due date |
|---|---|---|---|---|
| EMI test receiver | R&S | ESCI | 101351 | 2020/07/18 |
| EMI test receiver | R&S | ESR3 | 102305 | 2020/07/18 |
| Artificial Mains Network | R&S | ENV216 | 101620 | 2020/07/18 |
| Artificial Mains Network | SCHWARZBECK | NSLK 8128 | 8128-287 | 2020/08/12 |
| Asymmetric artificial network | SCHWARZBECK | NTFM8131 | 8131-151 | 2020/07/18 |
| Asymmetric artificial network | TESEQ | ISN T800 | 30306 | 2020/07/18 |
| High power voltage probe | SCHWARZBECK | TK9421 | #308 | 2020/04/20 |
| Capacitive voltage probe | TESEQ | CVP 2200A | 43476 | 2020/07/18 |
| Current probe | ETS.LINDGREN | 91550-1L | 218473 | 2020/08/13 |

CDNE

| Equipment | Manufacturer | Model No. | Serial No. | Cal. due date |
|---|---|---|---|---|
| EMI test receiver | R&S | ESCI | 101351 | 2020/07/18 |
| EMI test receiver | R&S | ESR3 | 102305 | 2020/07/18 |
| Coupling/Decoupling Network | SCHWARZBECK | CDNE M3 | 00088 | 2020/12/11 |
| Coupling/Decoupling Network | TESEQ | CDN M016S | 34640 | 2020/07/18 |

Radiated electromagnetic disturbances (9 kHz to 30 MHz)

| Equipment | Manufacturer | Model No. | Serial No. | Cal. due date |
|---|---|---|---|---|
| EMI test receiver | R&S | ESCI | 101351 | 2020/07/18 |
| EMI test receiver | R&S | ESR3 | 102305 | 2020/07/18 |
| 3-dimensional large loop antenna | SCHWARZBECK | HXYZ 9170 | HXYZ9170-245 | 2020/07/18 |

Disturbance Power

| Equipment | Manufacturer | Model No. | Serial No. | Cal. due date |
|---|---|---|---|---|
| EMI test receiver | R&S | ESCI | 101351 | 2020/07/18 |
| EMI test receiver | R&S | ESR3 | 102305 | 2020/07/18 |
| EMI absorbing clamp | SCHWARZBECK | MDS 21B | 4183 | 2020/07/25 |

Click

| Equipment | Manufacturer | Model No. | Serial No. | Cal. due date |
|---|---|---|---|---|
| EMI test receiver | R&S | ESR3 | 102305 | 2020/07/18 |
| Artificial Mains Network | R&S | ENV216 | 101620 | 2020/07/18 |
| Artificial Mains Network | SCHWARZBECK | NSLK 8128 | 8128-287 | 2020/08/09 |

Harmonic & Flicker

| Equipment | Manufacturer | Model No. | Serial No. | Cal. due date |
|---|---|---|---|---|
| Harmonic currents and flicker tester | California Instruments | CTS | 1306A00135 | 2020/05/14 |
| AC power source | California Instruments | 5001iX-CTS-400 | 1306A00135 | 2020/05/14 |
| Harmonic currents and flicker tester | TESEQ | Profline 2145 | 1736A02510 | 2020/08/09 |

ESD

| Equipment | Manufacturer | Model No. | Serial No. | Cal. due date |
|---|---|---|---|---|
| ESD generator | TESEQ | NSG 435 | 6716 | 2020/06/05 |

EFT, Surge and V-Dips

| Equipment | Manufacturer | Model No. | Serial No. | Cal. due date |
|---|---|---|---|---|
| EFT, Surge, DIPS all-in-one | TESEQ | NSG-3040-MF | 2006/EFT:0535 /SURGE:1234 /DIPS:2062 | 2020/05/14 |

Injected currents

| Equipment | Manufacturer | Model No. | Serial No. | Cal. due date |
|---|---|---|---|---|
| Compact immunity test system (RF) | TESEQ | NSG 4070-30 | 35895 | 2020/05/14 |
| Coupling decoupling network (CDN) | TESEQ | CDN M016S | 34640 | 2020/05/14 |
| Attenuator | TESEQ | ANT 6050 | 34847 | 2020/05/14 |

# 9 TEST PHOTOS

## Conducted disturbance voltage at mains terminals

## Disturbance power

----------END----------