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

Test report No:
6100635.50

TEST REPORT
Electromagnetic Compatibility (EMC)

Identification of item tested	LED Recessed luminaire
Trademark	PROFOLUX
Model and /or type reference	DR-MB, DR-MW, DT, DRT, DZ-M
Ratings	220-240 Vac, 50/60 Hz, Class II; 6 , 9 , 12 W
Test Laboratory	DEKRA Testing and Certification (Shanghai) Ltd. No.250, Jiangchangsan Road, Jing'an District, Shanghai, China
Applicant´s name / address	Profolux bv led supplier Van Leeuwenhoekweg 8, 5482 TK Schijndel, The Netherlands
Test method requested, standard	EN IEC 55015:2019+A11:2020 EN 61547:2009 EN IEC 61000-3-2:2019 EN 61000-3-3:2013+A1:2019
Verdict Summary	IN COMPLIANCE
Tested by (name / position & signature)	Kaiyuan Dai Test Engineer
Approved by (name / position & signature)	Zuyao Fan Project Manager
Date of issue	2021-06-22
Report template No	TRF_EN55015_EN61547_EMC V1.2

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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.

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. For all other measurements where no guidance is available, the measurement instrumentation uncertainty has been calculated and applied in accordance with ISO/IEC Guide 98-3 document.

Uncertainties have been calculated according to the DEKRA internal document MU-EMC. 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.

The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to calculate the uncertainty associated with the measurement result, unless the specification, standard or customer have special requirements

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
N/A : Not Applicable
N/M : Not Measured

DOCUMENT HISTORY

Report nr.	Date	Description
6100635.50	2021-06-22	First release.

CONCLUSION, REMARKS AND COMMENTS

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

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According to the declaration from manufacturer, all models have the similar construction except for the different driver and rated power.

Due to the similarity of them, model DR-MB090 was selected for the full test and the rusults are also representative for other models as well.

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Description of the item .....:	LED Recessed luminaire
Test model / type number .....:	DR-MB090
Trademark.....:	PROFOLUX
Manufacturer.....:	Profolux bv led supplier Van Leeuwenhoekweg 8, 5482 TK Schijndel, The Netherlands
Factory.....:	Profolux bv led supplier Van Leeuwenhoekweg 8, 5482 TK Schijndel, The Netherlands

Type of the EUT.....:	☒	Luminaire
	☐	Rope light (6.3)
	☐	Internal Module (6.4.3)
	☐	External module (6.4.4)
	☐	Module having multiple applications (6.4.2)
	☐	Single capped self-ballasted lamp (6.4.5)
	☐	Double-capped self-ballasted lamps, double-capped lamp adapters, double-capped semi-luminaires and double-capped retrofit lamps used in fluorescent lamp luminaires (6.4.6)
	☐	ELV lamps (6.4.7)
	☐	Single-capped semi-luminaires (6.4.8)
	☐	Independent igniter (6.4.9)
	☐	Replaceable starters for fluorescent lamps (6.4.10)
Control Gear used .....:	☐	Magnetic control gear / transformer
	☒	Electronic control gear
	☐	Others:
Lamp technology used.....:	☒	Light emitting diode (LED/OLED)
	☐	High pressure discharge lamp (HID)
	☐	Fluorescent lamp
	☐	Tungsten halogen lamp
	☐	Incandescent lamp
	☐	Others:
Dimming.....:	☒	Test item has NO dimming functions
	☐	Test item includes dimming functions other than phase control
	☐	Test item includes phase control dimming functions

Rated power supply ..... :	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☒	AC: 220 – 240 V, 50/60 Hz	☒	☐	☐	☒	☐
	☐	DC					
	☐	Battery:					
Rated Power ..... :	12 W						
Clock frequencies ..... :	<30 MHz						
Other parameters..... :	N/A						
Software version ..... :	Not provided						
Hardware version..... :	Not provided						
Dimensions in cm (W x H x D).... :	Not provided						
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 products are recessed luminaire which can be used indoor only.

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

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

No.	Test model	Type
1	DR-MB090	9 W
2		
3		
4		
5		
6		

1.2 The environment(s) in which the EUT is intended to be used

The equipment under test (EUT) is intended to be used in the following environment(s):

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

1.3 Test data

For radiated EM field immunity tests:

Location	DEKRA Testing and Certification (Suzhou) Co., Ltd.
Address	No. 99, Hongye Road, Suzhou Industrial Park, Suzhou, Jiangsu, China.
Date(s) of performance of tests	2021-06
Supervised by	Zuyao Fan

For other tests:

Location	DEKRA Testing and Certification (Shanghai) Ltd.
Address	No.250, Jiangchangsan Road, Jing'an District, Shanghai, China
Date of receipt of test item	2021-04
Date(s) of performance of tests	2021-06
Supervised by	Zuyao Fan

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 operating	☒	☒
		☐	☐
		☐	☐
		☐	☐
Supplemental information: ---			

2.2 Port(s) of the EUT

Port name and description	Port name / description	Cable		
		Length used during test [m]	Attached during test	Shielded
Wired network ports	AC mains	0,8 m	☒	☐
			☐	☐
			☐	☐
			☐	☐
			☐	☐
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

Refer to Annex 3.

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 IEC 55015 +A11	2019 2020	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
EN 55016-2-1 +A1	2014 2017	Methods of measurement of disturbances and immunity - Conducted disturbance measurements.
EN 55016-2-3	2017	Methods of measurement of disturbances and immunity - Radiated disturbance measurements.
EN 55032	2015	Electromagnetic compatibility of multimedia equipment – Emission requirements.
EN IEC 61000-3-2	2019	Limits for harmonic current emissions (equipment input current ≤ 16 A per phase).
EN 61000-3-3 +A1	2013 2019	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 61547	2009	Equipment for general lighting purposes – EMC immunity requirements.
EN 61000-4-2	2009	Electrostatic discharge immunity test.
EN 61000-4-3 +A1 +A2	2006 2008 2009	Radiated, radio-frequency, electromagnetic field immunity test.
EN 61000-4-4	2004	Electrical fast transient/burst immunity test.
EN 61000-4-5	2006	Surge immunity test.
EN 61000-4-6	2009	Immunity to conducted disturbances, induced by radio-frequency fields.
EN 61000-4-8	2008	Power frequency magnetic field immunity test.
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:

Summary of compliance with National Differences (List of countries addressed):

The product also fulfils the requirements of CISPR 15:2018, IEC 61547:2009, IEC 61000-3-2:2018, IEC 61000-3-3:2013+A1:2017.

3.3 Overview of results

EMISSION TESTS – EN IEC 55015			
Requirement – Test case	**Basic Standard(s)**	**Verdict**	**Remark**
Conducted disturbance voltage at mains terminals (9 KHz – 30 MHz)	EN 55016-2-1	PASS	---
Conducted disturbance voltage at load terminals (150 KHz – 30 MHz)	EN 55016-2-1	N/A	See 3)
Conducted disturbance voltage at control terminals (150 KHz – 30 MHz)	EN 55016-2-1	N/A	See 3)
Radiated electromagnetic disturbances (9 kHz to 30 MHz)	EN 55016-2-3	PASS	---
Radiated electromagnetic disturbances (30 – 1000 MHz)	EN 55032	N/M	---
Independent method of measurement of radiated emission (CDN) / Annex B	EN 55016-2-1	Pass	See 2)
Insertion loss	EN IEC 55015	N/A	See 1)
Supplementary information: 1) The test is not applicable because the luminaire is not a starter switch operated type. 2) The CDNE method and the associated limits up to 300 MHz can be only applied for EUTs with clock frequencies below or equal to 30 MHz and the largest dimensions of the EUT are 3 m x 1 m x 1 m (l x w x h). 3) There are no load and control terminals.			

EMISSION TESTS –EN IEC 61000-3-2, EN 61000-3-3			
Requirement – Test case	**Basic Standard(s)**	**Verdict**	**Remark**
Control principle shall be allowed for the application according to the clause	EN IEC 61000-3-2	PASS	---
Harmonic current emissions	EN IEC 61000-3-2	PASS	---
Voltage changes, voltage fluctuations and flicker	EN 61000-3-3	N/M	See 1)
Supplementary information: 1) LED lamp luminaires with ratings less than or equal to 600 W, are deemed to comply with the dc, dmax and Tmax limits in this standard and are not required to be tested.			

IMMUNITY TESTS – EN 61547			
Requirement – Test case	**Basic Standard(s)**	**Verdict**	**Remark**
Electrostatic discharge	EN 61000-4-2	PASS	---
Radio-frequency electromagnetic fields	EN 61000-4-3	PASS	---
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	---
Power frequency magnetic fields	EN 61000-4-8	N/A	See 1)
Voltage dips and short interruptions	EN 61000-4-11	PASS	---
Supplementary information: 1) The apparatus does not contain any components susceptible to this low-frequency magnetic fields.			

4 EMISSION TEST RESULTS

4.1	**Conducted disturbance at electric power supply interface**	**VERDICT: PASS**

Standard	EN IEC 55015
Basic standard	EN 55016-2-1

Limits

Frequency range [MHz]	Limit: QP [dB(μV)[1)]]	Limit: AV [dB(μV) [1)]]	IF BW	Detector(s)
0,009 - 0,05	110	N/A	200 Hz	QP
0,05 - 0,15	90 – 80 [2)]	N/A	200 Hz	QP
0,15 - 0,50	66 – 56 [2)]	56 - 46 [2)]	9 KHz	QP, CAV
0,50 - 5,0	56 [3)]	46 [3)]	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 in the ranges 50 kHz to 150 kHz and 150 kHz to 0,5 MHz.
[3)] For electrodeless lamps and luminaires, the limit in the frequency range of 2,51 MHz to 3,0 MHz is 73 dB(μV) quasi-peak and 63 dB(μV) average.

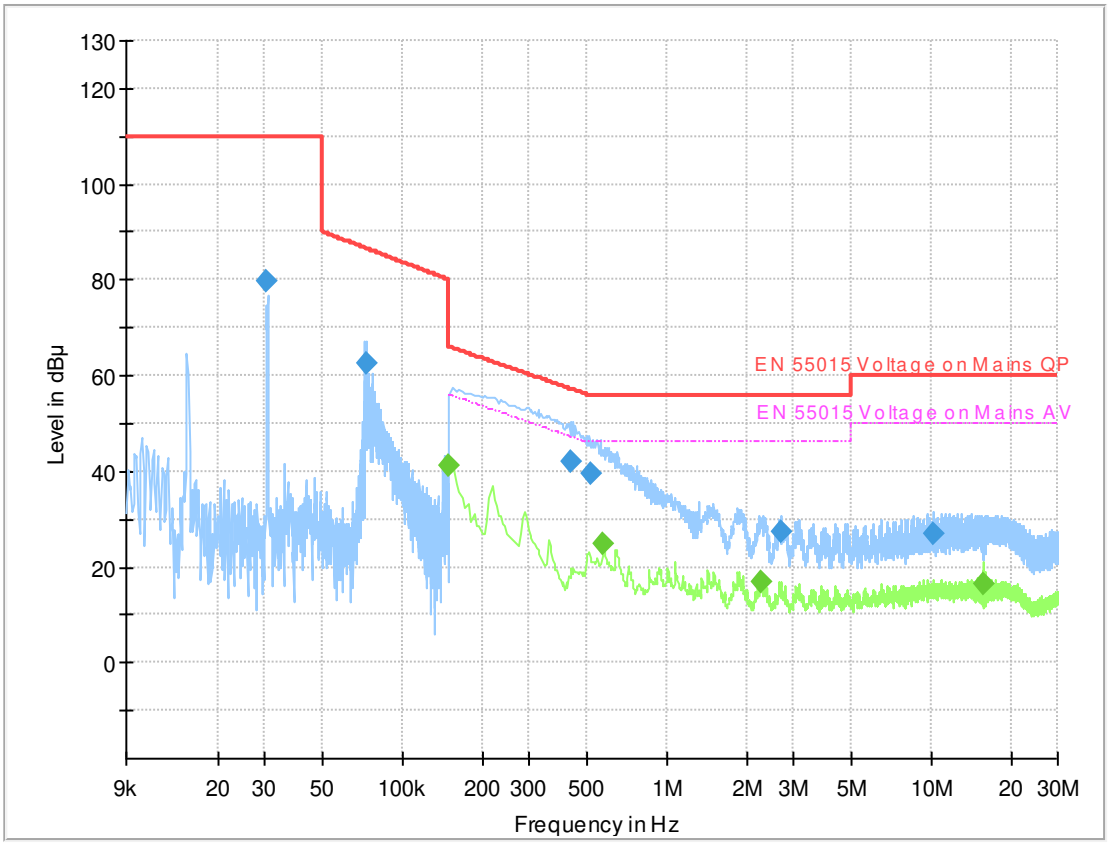
Performed measurements

Port under test		Terminal							
☒	AC mains input power	☒	N	☒	L1	☐	L2	☐	L3
☐	AC output power	☐	N	☐	L1	☐	L2	☐	L3

Voltage – Mains [V]	230 Vac	
Frequency – Mains [Hz]	50 Hz	
Test method applied	☒	Artificial mains network
	☐	Voltage probe
Test setup	☒	Set-up Type A (40 cm distance to vertical ground plane, 80 cm o ground plane)
	☐	Set-up Type B (40 cm distance to horizontal ground plane)
	☐	Floor standing equipment set-up (10 cm over ground plane)
	☐	Other:
	☐	Artificial hand applied (See photo)
	Refer to the Annex 3 for test setup photo(s).	
Operating mode(s) used	Mode 1	
Remark	The RF disturbance level was investigated at all operating modes listed at chapter 2.1 respectively. The worst case results were reported.	

See next page.

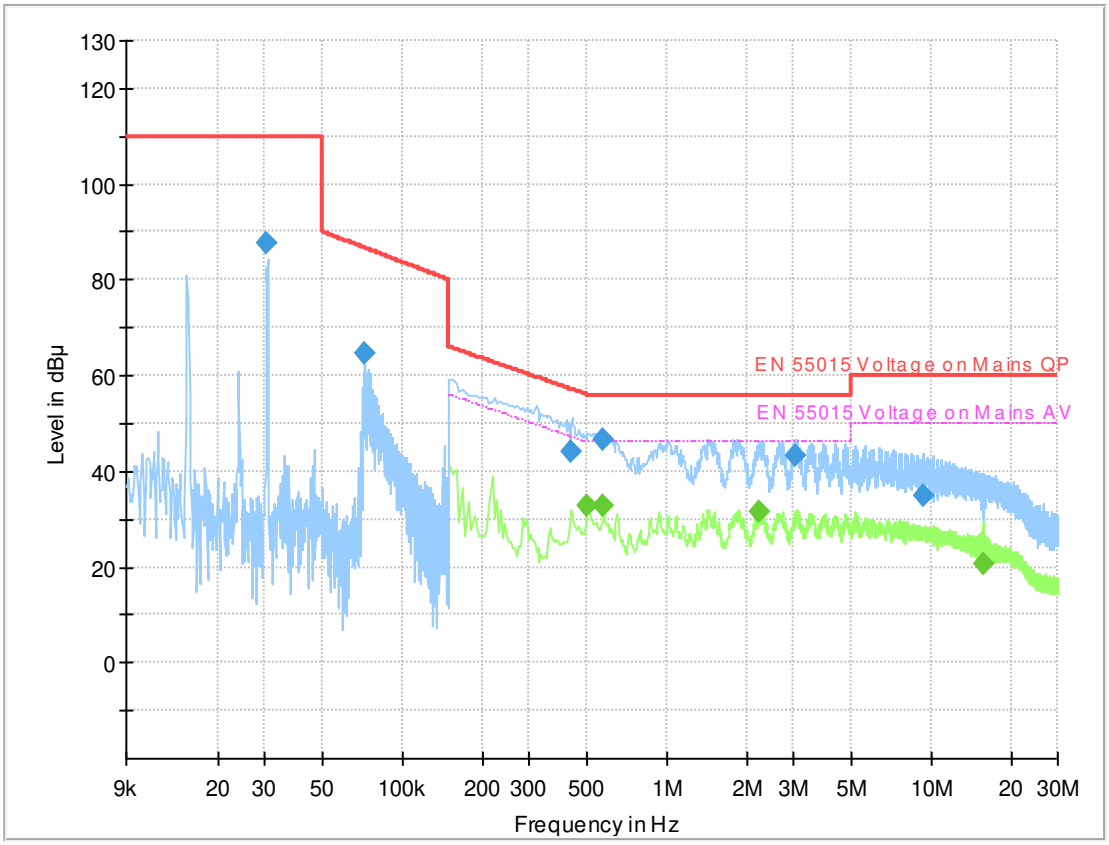
Measurement data	☒	**Line**	☐	**Neutral**
Operating mode / voltage / frequency used during the test		Mode 1 / 230 Vac / 50 Hz		
Port under test		AC mains input port		
Model 1				



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Corr. (dB)
0.030700	79.59	---	110.00	30.41	9.7
0.072900	62.63	---	86.57	23.94	9.6
0.150001	---	41.33	56.00	14.67	9.6
0.433500	42.04	---	57.19	15.14	9.7
0.519000	39.29	---	56.00	16.71	9.7
0.573000	---	24.85	46.00	21.15	9.7
2.287500	---	16.82	46.00	29.18	9.7
2.719500	27.54	---	56.00	28.46	9.8
10.153500	26.75	---	60.00	33.25	10.0
15.801000	---	16.35	50.00	33.65	10.3

Remark	---

Measurement data	☐	**Line**	☒	**Neutral**
Operating mode / voltage / frequency used during the test		Mode 1 / 230 Vac / 50 Hz		
Port under test		AC mains input port		
Model 1				



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Corr. (dB)
0.030700	87.73	---	110.00	22.27	9.7
0.072100	64.71	---	86.67	21.96	9.6
0.433500	44.16	---	57.19	13.02	9.7
0.501000	---	32.90	46.00	13.10	9.7
0.573000	---	32.94	46.00	13.06	9.7
0.573000	46.76	---	56.00	9.24	9.7
2.224500	---	31.33	46.00	14.67	9.7
3.066000	43.48	---	56.00	12.52	9.8
9.303000	34.89	---	60.00	25.11	10.0
15.742500	---	20.49	50.00	29.51	10.2

Remark	---

4.2 **Radiated disturbances (9 KHz – 30 MHz)**	**VERDICT: PASS**

Standard	EN IEC 55015
Basic standard	EN 55016-2-3
Test method	Large Loop Antenna (LLA) or Loop antenna

Limits LLA- D ≤ 1.6m

Frequency range [MHz]	Limit: QP [dB(μV/m)[1)]]	IF BW	Detector(s)
0,009 - 0,07	88	200 Hz	Quasi-Peak (QP)
0,07 - 0,15	88 – 58 [2)]	200 Hz	Quasi-Peak (QP)
0,15 - 2,2	58 – 22 [2)]	9 KHz	Quasi-Peak (QP)
2,2 - 3,0	58 [3)]	9 KHz	Quasi-Peak (QP)
3,0 - 30	22	9 KHz	Quasi-Peak (QP)

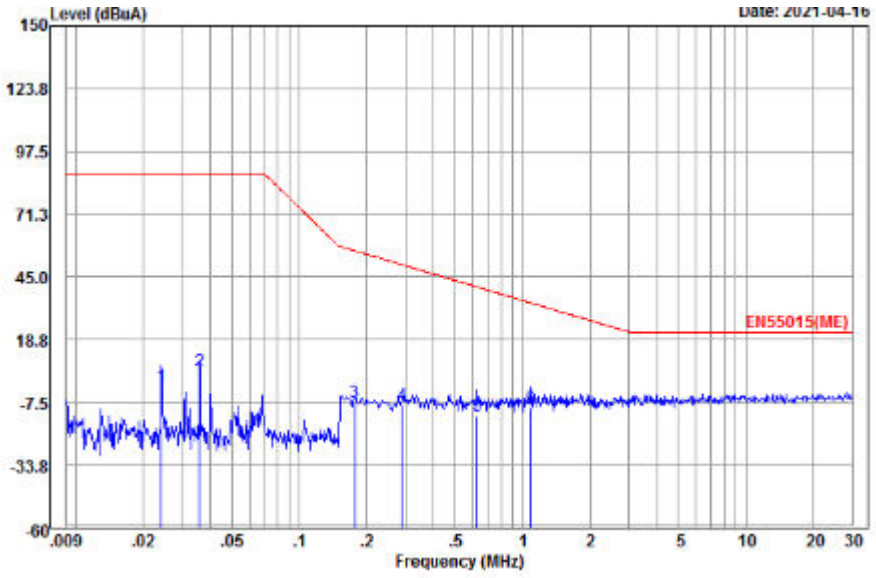
[1)] At the transition frequency, the lower limit applies.
[2)] The limit decreases linearly with the logarithm of the frequency.
[3)] For lighting equipment incorporating exclusively electrodeless lamps, the limit applies.

Performed measurements

Port under test	Enclosure	
Voltage – Mains [V]	230 Vac	
Frequency – Mains [Hz]	50 Hz	
Applied Limit for antenna measurement (Table 9)	☐	Loop antenna radiated disturbance limit 9 kHz – 30 MHz for equipment with a dimension > 1,6 m
Applied limit according to LLAS diameter (Table 8)	☒	2 m for equipment length not exceeding 1,6m
	☐	3 m for equipment length between 1,6 m and 2,6 m
	☐	4 m for equipment length between 2,6 m and 3,6 m
Test setup	☒	Equipment placed in the centre of the LLAS
	☐	Equipment on a table 80 cm height
	☐	Equipment on the floor (isolated from ground plane)
	☐	Other: --
	Refer to the Annex 3 for test setup photo(s).	
Operating mode(s) used	Mode 1	
Remark	The RF disturbance level was investigated at all operating modes listed at chapter 2.1 respectively. The worst case results were reported.	

See next page.

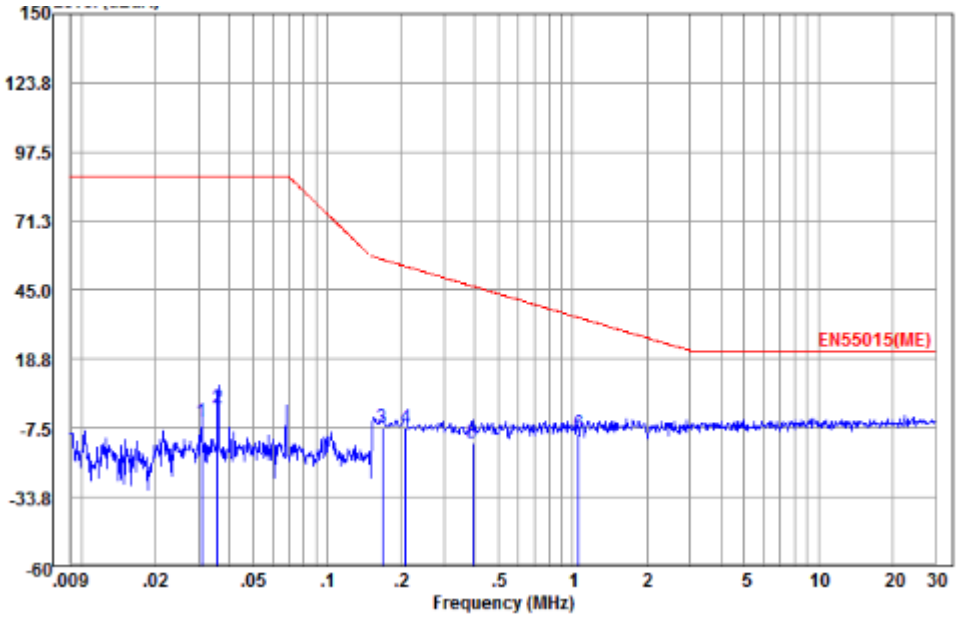
Measurement data	☒	**X-axis**	☐	**Y-axis**	☐	**Z-axis**
Operating mode / voltage / frequency used during the test			Mode 1 / 230 Vac / 50 Hz			
Model 1						



	Freq	Limit Line	Level	Read Level	LISN Factor	Cable Loss	Over Limit	Remark
	MHz	dBuA	dBuA	dBuA	dB	dB	dB	
1	0.02	88.00	-0.39	-34.38	0.00	0.01	-88.39	QP
2	0.04	88.00	5.61	-28.38	0.00	0.01	-82.39	QP
3	0.18	56.03	-7.48	-41.48	0.00	0.02	-63.51	QP
4	0.29	50.11	-8.68	-42.68	0.00	0.02	-58.79	QP
5	0.63	40.81	-13.27	-47.28	0.00	0.03	-54.08	QP
6 pp	1.09	34.19	-9.46	-43.48	0.00	0.04	-43.65	QP

Remark	The given graph is the combination of max-hold function

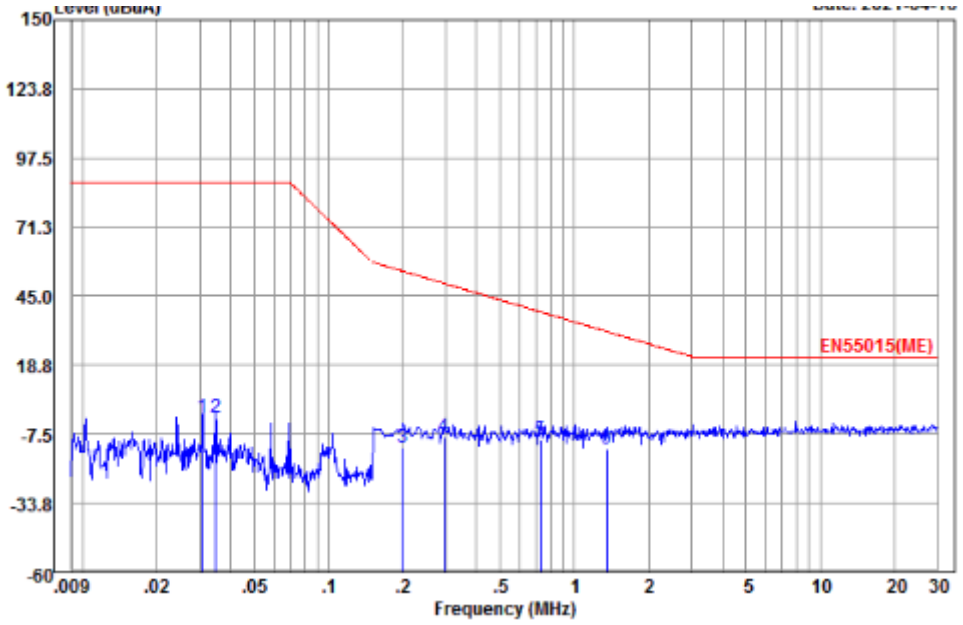
Measurement data	☐	**X-axis**	☒	**Y-axis**	☐	**Z-axis**
Operating mode / voltage / frequency used during the test			Mode 1 / 230 Vac / 50 Hz			
Model 1						



	Freq	Limit Line	Level	Read Level	LISN Factor	Cable Loss	Over Limit	Remark
	MHz	dBuA	dBuA	dBuA	dB	dB	dB	
1	0.03	88.00	-4.99	-38.98	0.00	0.01	-92.99	QP
2	0.04	88.00	0.21	-33.78	0.00	0.01	-87.79	QP
3	0.17	56.66	-7.08	-41.08	0.00	0.02	-63.74	QP
4	0.21	54.05	-7.58	-41.58	0.00	0.02	-61.63	QP
5	0.39	46.54	-13.27	-47.28	0.00	0.03	-59.81	QP
6 pp	1.05	34.57	-9.46	-43.48	0.00	0.04	-44.03	QP

Remark	The given graph is the combination of max-hold function

Measurement data	☐	**X-axis**	☐	**Y-axis**	☒	**Z-axis**
Operating mode / voltage / frequency used during the test			Mode 1 / 230 Vac / 50 Hz			
Model 1						



	Freq	Limit Line	Level	Read Level	LISN Factor	Cable Loss	Over Limit	Remark
	MHz	dBuA	dBuA	dBuA	dB	dB	dB	
1	0.03	88.00	-1.09	-35.08	0.00	0.01	-89.09	QP
2	0.03	88.00	-1.09	-35.08	0.00	0.01	-89.09	QP
3	0.20	54.56	-12.78	-46.78	0.00	0.02	-67.34	QP
4	0.29	49.91	-8.48	-42.48	0.00	0.02	-58.39	QP
5	0.73	39.03	-9.36	-43.38	0.00	0.04	-48.39	QP
6 pp	1.35	31.58	-13.35	-47.38	0.00	0.05	-44.93	QP

Remark	The given graph is the combination of max-hold function

4.3 **Radiated disturbance (30 – 300 MHz) - CDNE method**	**VERDICT: PASS**

Standard	EN IEC 55015
Basic standard	EN 55016-2-1
Test method	CDNE method

Limits

Frequency [MHz]	Limit: QP [dB(μV)[1)]]	IF BW	Detector(s)
30 – 100	64 – 54 [2)]	120 KHz	Quasi-Peak (QP)
100 – 230	54	120 KHz	Quasi-Peak (QP)
230 – 300	54 – 51 [2)]	120 KHz	Quasi-Peak (QP)

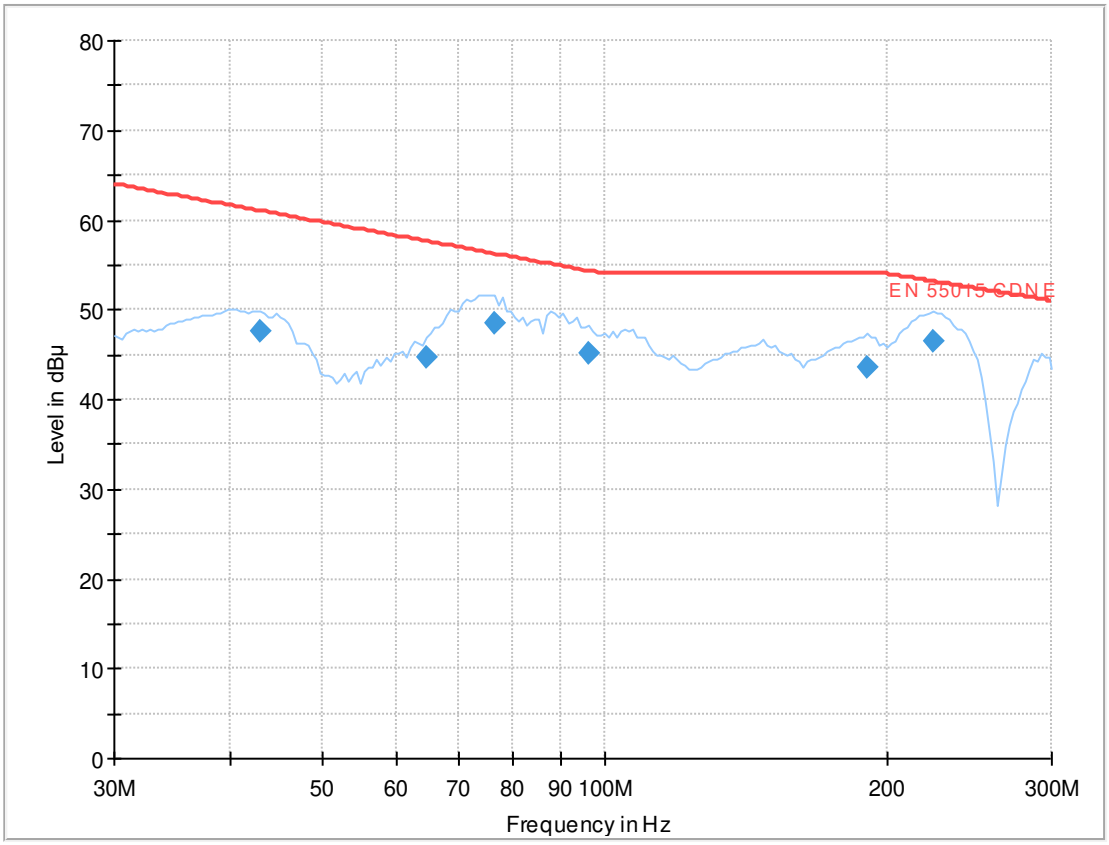
[1)] At the transition frequency, the lower limit applies.
[2)] The limit decreases linearly with the logarithm of the frequency.

Performed measurements

Tested terminal(s) / port	☒	AC mains input terminal	☐	Control terminal
	☐	DC mains input terminal	☐	Load terminal
	☐	Other:		
Voltage – Mains [V]	230 Vac			
Frequency – Mains [Hz]	50 Hz			
Test setup	Equipment on a 10 cm support over the ground plane according CDNE-Method			
Operating mode(s) used	Mdoe 1			
Remark	The RF disturbance level was investigated at all operating modes listed at chapter 2.1 respectively. The worst case results were reported.			

See next page.

Measurement data	Port under test	AC mains input port
Operating mode / voltage / frequency used during the test		Mode 1 / 230 Vac / 50 Hz
Model 1		



Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Corr. (dB)
42.923064	47.64	61.03	13.38	19.7
64.665659	44.66	57.62	12.96	19.7
76.561709	48.45	56.22	7.77	19.8
96.099690	45.08	54.33	9.25	19.8
190.819938	43.66	54.00	10.34	20.5
223.892094	46.38	53.17	6.78	20.8

Remark	The given graph is the combination of max-hold function

4.4 **Harmonic current emissions**	**VERDICT: PASS**

Standard	EN IEC 61000-3-2	
Exlusions (For these categories of equipment, limits are not specified in the EN IEC 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).
	☐	Lighting equipment with a rated power ≤ 5W.
	☐	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 phase control dimmers with a rated power less than or equal to 1 kW when operating incandescent lamps
	☐	Independent phase control dimmers with a rated power less than or equal to 200 W for trailing edge dimmers and universal phase control dimmers with the default mode set to trailing edge, when operating lighting equipment other than incandescent lamps
	☐	Independent phase control dimmers with a rated power less than or equal to 100 W for leading edge dimmers, and universal phase control dimmers without default mode set to trailing edge, when operating lighting equipment other than incandescent lamps.

Classification			
☐	Class A	All apparatus not classified as Class B, C or D	
☐	Class B	Portable tools	
☒	Class C	☐	Lighting equipment with rated power > 25 W
		☒	Lighting equipment with rated power ≥ 5W and ≤ 25 W (First requirement, Table 3 column 2)
		☐	Lighting equipment with rated power ≥ 5W and ≤ 25 W (Second requirement)
		☐	Lighting equipment with rated power ≥ 5W and ≤ 25 W (Third requirement)
☐	Class D	Personal computers, television receivers	

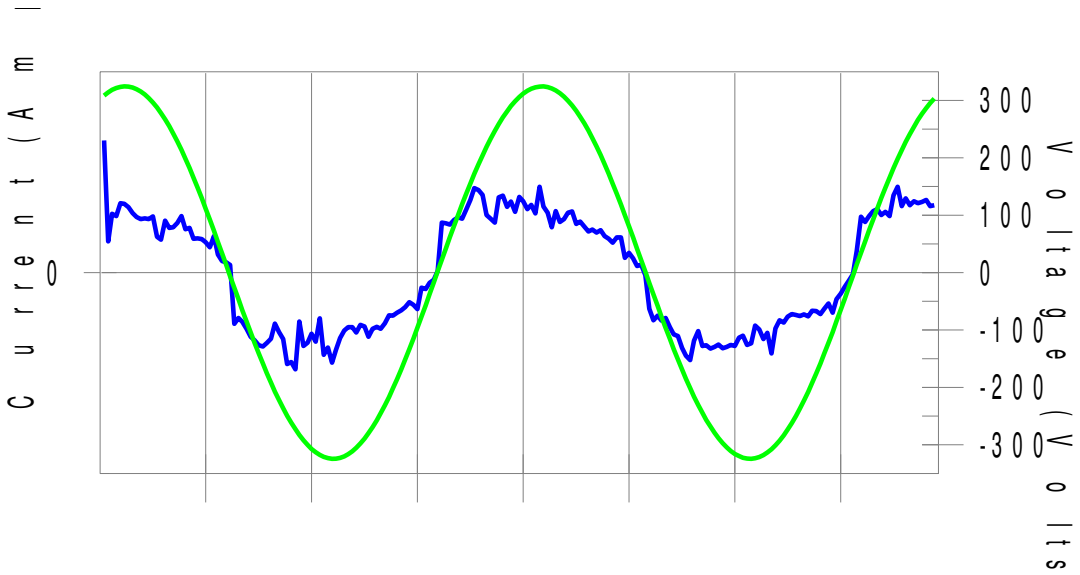
Performed measurements

Port under test	AC mains input port					
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	with the means for control set to the position which produce the maximum total harmonic current (THC) within the active input power range [Pmin, Pmax]					

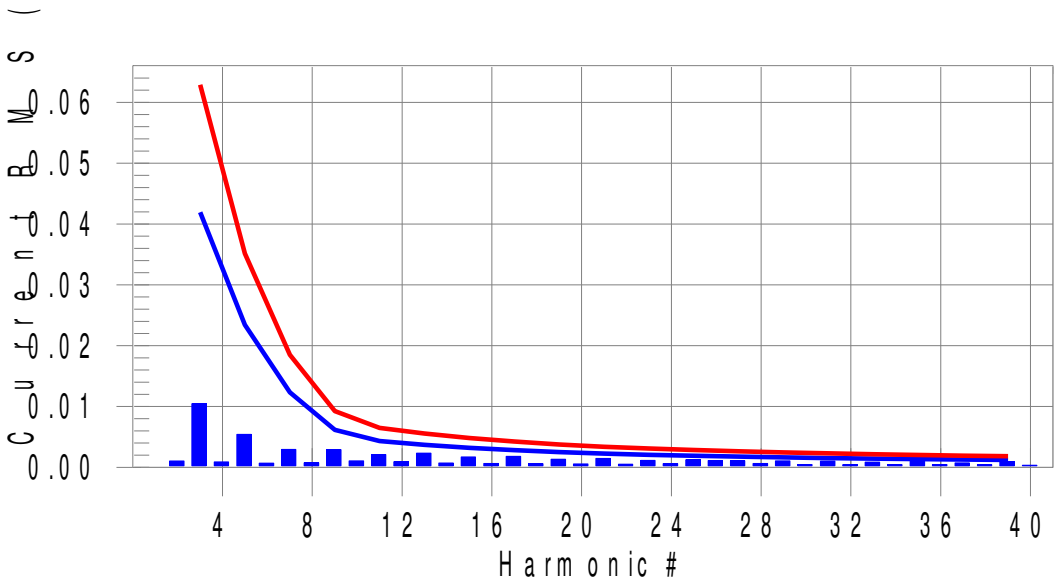
See next page.

Measurement data	Port under test	AC mains input port
Operating mode / voltage / frequency used during the test		Mode 1 / 230 Vac / 50 Hz
Model 1		

Current & voltage waveforms



Harmonics and Class C limit line (Table-2 Class-C) **European Limits**



Test result: Pass

Measurement data	Port under test	AC mains input port

Test Result: Pass Source qualification: Normal
THC(A): 0.014 I-THD(%): 25.3 POHC(A): 0.003 POHC Limit(A): 0.005

Highest parameter values during test:

V_RMS (Volts):	**229.58**	**Frequency(Hz):**	**50.00**
I_Peak (Amps):	**0.145**	**I_RMS (Amps):**	**0.058**
I_Fund (Amps):	**0.055**	**Crest Factor:**	**2.569**
Power (Watts):	**12.3**	**Power Factor:**	**0.945**

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	0.000	N/A	0.001	0.000	N/A	Pass
3	0.010	0.042	24.9	0.011	0.063	17.9	Pass
4	0.001	0.000	N/A	0.001	0.000	N/A	Pass
5	0.005	0.023	23.2	0.006	0.035	16.8	Pass
6	0.001	0.000	N/A	0.001	0.000	N/A	Pass
7	0.003	0.012	N/A	0.003	0.019	N/A	Pass
8	0.001	0.000	N/A	0.001	0.000	N/A	Pass
9	0.003	0.006	N/A	0.003	0.009	N/A	Pass
10	0.001	0.000	N/A	0.001	0.000	N/A	Pass
11	0.002	0.004	N/A	0.003	0.006	N/A	Pass
12	0.001	0.000	N/A	0.001	0.000	N/A	Pass
13	0.002	0.004	N/A	0.003	0.006	N/A	Pass
14	0.001	0.000	N/A	0.001	0.000	N/A	Pass
15	0.002	0.003	N/A	0.002	0.005	N/A	Pass
16	0.001	0.000	N/A	0.001	0.000	N/A	Pass
17	0.002	0.003	N/A	0.002	0.004	N/A	Pass
18	0.001	0.000	N/A	0.001	0.000	N/A	Pass
19	0.001	0.003	N/A	0.002	0.004	N/A	Pass
20	0.001	0.000	N/A	0.001	0.000	N/A	Pass
21	0.001	0.002	N/A	0.002	0.003	N/A	Pass
22	0.001	0.000	N/A	0.001	0.000	N/A	Pass
23	0.001	0.002	N/A	0.001	0.003	N/A	Pass
24	0.001	0.000	N/A	0.001	0.000	N/A	Pass
25	0.001	0.002	N/A	0.001	0.003	N/A	Pass
26	0.001	0.000	N/A	0.001	0.000	N/A	Pass
27	0.001	0.002	N/A	0.001	0.003	N/A	Pass
28	0.001	0.000	N/A	0.001	0.000	N/A	Pass
29	0.001	0.002	N/A	0.001	0.002	N/A	Pass
30	0.000	0.000	N/A	0.001	0.000	N/A	Pass
31	0.001	0.002	N/A	0.001	0.002	N/A	Pass
32	0.000	0.000	N/A	0.001	0.000	N/A	Pass
33	0.001	0.001	N/A	0.001	0.002	N/A	Pass
34	0.000	0.000	N/A	0.001	0.000	N/A	Pass
35	0.001	0.001	N/A	0.001	0.002	N/A	Pass
36	0.000	0.000	N/A	0.001	0.000	N/A	Pass
37	0.001	0.001	N/A	0.001	0.002	N/A	Pass
38	0.000	0.000	N/A	0.001	0.000	N/A	Pass
39	0.001	0.001	N/A	0.001	0.002	N/A	Pass
40	0.000	0.000	N/A	0.000	0.000	N/A	Pass

Remark	---

5 IMMUNITY TEST RESULTS

5.1 Classification according to EN 61547

The immunity test requirements apply to the following lighting equipment:

☒	Self-ballasted lamps and semi-luminaires.
☐	Independent auxiliaries.
☐	Luminaires or equivalent appliances (including emergency lighting).

5.2 Performance (Compliance) criteria

[According to EN 61547]

Performance criteria A : During the test no change of the luminous intensity shall be observed and the requlating control, if any, shall operate during the test as intended. The luminous intensity shall be deemed to be unchanged if the measured intensities do not deviate by more than 15 %.

Performance criteria B : During the test the luminous intensity may change to any value. After the test the luminous intensity shall be restored to its initial value within 1 min. Regulating controls need not function during the test, but after the test the mode of the control shall be the same as before the test provided that during the test no mode changing commands were given.

Performance criteria C : During and after the test any change of luminous intensity is allowed and the lamp(s) may be extinguished. After the test, within 30 min, all functions shall retırn to normal if necessary by temporary interruption of the mains supply and/or operating the regulating control.

Product		Test (sublause – of this document) and performance criteria							
		6.1 (ESD)	6.2 (RI)	6.3 (EFT)	6.4 (Surge)	6.5 (RF-CI)	6.6 (MI)	6.7 (Dips&Interruptions)	
								Dips	Interruption
☐	Self-ballasted lamps	B	A	B	C	A	A	C	B
☐	Independent electronic auxiliary [4)]	B	A	B	C	A	A	C	B[1)]
☒	Luminaire including active electronic component	B	A	B	C	A	A	C	B[1)]
☐	Luminaire for emergency lighting [5)]	B[2)]	A	B[2)]	B[2)]	A	A	See [3)]	See [3)]

Supplementary information:

[1)] For ballasts where the lamp is not able to restart within 1 min, due to the physical constraints of the lamp, performance criterion C applies.

[2)] For emergency luminaires designed to operate in high-risk task areas, after the test, the luminous intensity shall be restored to its initial value within 0,5 s.

[3)] These tests do not apply as they are covered by the test in IEC 60598-2-22.

[4)] These tests apply for built-in auxiliaries which set for independent auxiliaries

[5)] Luminaires for emergency lighting shall be tested in both the normal and emergency mode of operation.

5.2.1 Manufacturer defined performance criteria

Not provided.

5.3 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 :
☐	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	Illumination	Visual observation
Radio-frequency electromagnetic fields	Illumination	Visual observation / Camera
Fast transients	Illumination	Visual observation
Surge transient	Illumination	Visual observation
Injected currents (radio-frequency common mode)	Illumination	Visual observation
Voltage dips and short interruptions	Illumination	Visual observation
Supplementary information : In case of doubt, the luminous intensity shall be deemed to be unchanged if the measured intensities do not deviate by more than 15 %.		

5.4 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 61547							
Basic standard	EN 61000-4-2							
Port under test	Enclosure							
Air discharges	☒	±2 kV	☒	±4 kV	☒	±8 kV	☐	kV
Contact discharges	☐	±2 kV	☒	±4 kV	☐	±8 kV	☐	kV
Number of discharges	≥ 10 per polarity with ≥ 1 sec interval.							

Performed tests

Set-up	☒	Table-top	☐	Floor standing
Ambient temperature [°C]	23°C		Relative Humidity air [%]	49%
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 touchable by hand	±4	Contact	10	1
☒	Points on non-conductive surface touchable by hand	±2, ±4, ±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:

5.5 Radio-frequency electromagnetic fields immunity — VERDICT: PASS

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 61547			
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)		
(see annex 3 for photo)	☐	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	1%
(step size 1%)	V	3 V/m	80% AM (1kHz)	3 s	1%

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: ---	

5.6 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 61547		
Basic standard		EN 61000-4-4		
Pulse characteristics		5/50 ns		
Port under test		Test level	Repetition frequency	Duration
☒	AC input-output power	± 1000 V	5 KHz	2 min. / polarity
☐	DC input-output power 2)	± 500 V	5 KHz	2 min. / polarity
☐	Signal and Control lines 1) 3)	± 500 V	5 KHz	2 min. / polarity

1) Only applicable to ports interfacing with cables whose total length may exceed 3 m.
2) Only applicable to equipment that is connected to the mains while in use.
3) Change of state commands are not applied during the test.

Performed tests

Voltage – Mains [V]	230 Vac			
Frequency – Mains [Hz]	50 Hz			
Operating mode(s) used	Mode 1			
Test Set-up (see annex 3 for photo)	☐	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. Location refer to annex 3.		
Coupling	☒	Common mode	☐	Other:

Port under test	Test Voltage &Polarity	Repetition Frequency	Test duration / polarity	Injection method			
AC mains power input	± 1000 V	5 KHz	2 min	☒	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.						

5.7	**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 61547
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)

Device type		Port	Test level & Polarity	Coupling	Phase angle	Perf. Criteria
☐	Luminaires and independent auxiliaries with rated input power > 25 W.	AC input power [1)]	+ 1 kV	Line to Line	90°	C; See chapter 5.2 for details.
			- 1 kV	Line to Line	270°	
		AC input power [1)]	+ 2 kV	Line to Earth	90°	
			- 2 kV	Line to Earth	270°	
☒	Luminaires and independent auxiliaries with rated input power ≤ 25 W.	AC input power	+ 0,5 kV	Line to Line	90°	C; See chapter 5.2 for details.
			- 0,5 kV	Line to Line	270°	
		AC input power [1)]	+ 1 kV	Line to Earth	90°	
			- 1 kV	Line to Earth	270°	
☐	Self-ballasted lamps and semi-luminaires	AC input power	+ 0,5 kV	Line to Line	90°	C; See chapter 5.2 for details.
			- 0,5 kV	Line to Line	270°	
		AC input power [1)]	+ 1 kV	Line to Earth	90°	
			- 1 kV	Line to Earth	270°	

[1)] In addition to the specified test level, all lower test levels as detailed in EN 61000-4-5 should also be satisfied.

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)

See next page.

Port under test		Coupling	Test level & Polarity	Phase angle [°]	Remark
☒	AC input power	Line to Neutral	+0,5 kV	90	--
			-0,5 kV	270	--
			+1 kV	90	N/A
			-1 kV	270	N/A
☐	AC input power	Line to Earth	+0,5 kV	90	N/A
			-0,5 kV	270	N/A
			+1 kV	90	N/A
			-1 kV	270	N/A
			+2 kV	90	N/A
			-2 kV	270	N/A
☐	AC input power	Neutral to Earth	+0,5 kV	90	N/A
			-0,5 kV	270	N/A
			+1 kV	90	N/A
			-1 kV	270	N/A
			+2 kV	90	N/A
			-2 kV	270	N/A
Supplementary information: 1. The EUT does not include an earth port.					
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.			

5.8	**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 61547			
Basic standard		EN 61000-4-6			
Frequency range		0,15 – 80 MHz			
Port under test		Test level, *Uo*	Modulation	Step size	Dwell time
☒	AC input-output power	3 V	80% AM (1kHz)	≤ 1%	≥ 0,5 s
☐	DC input-output power [2)]	3 V	80% AM (1kHz)	≤ 1%	≥ 0,5 s
☐	Signal and Control lines [1)]	3 V	80% AM (1kHz)	≤ 1%	≥ 0,5 s

[1)] Only applicable to ports interfacing with cables whose total length may exceed 3 m.
[2)] Only applicable to equipment that is connected to the mains while in use.

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 (see annex 3 for photo)		☐	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. Location refer to annex 3.		

Port under test	Test Level (applied)	Injection method	Dwell time (applied)	Remark
AC input power	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 was observed.			
Supplementary information: ---				

5.9 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 61547			
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 under test	Test level [1)]	Period (Cycles)		Performance Criteria
		50 Hz	60 Hz	
AC input power port	U_{NOM} – 30%	10	12	C; Refer to the chapter 5.2 for details.
AC input power port	U_{NOM} – ≥95%	0,5	0,5	C; Refer to the chapter 5.2 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	Test level [% U_{NOM}]	Duration [cycles]		Repetion rate [s]	Number of dips per test	Phase angle [°]
			50 Hz	60 Hz			
230	L-N	70	10	---	10	3	0, 180
230	L-N	0	0,5	---	10	3	0, 180

Operating mode	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:

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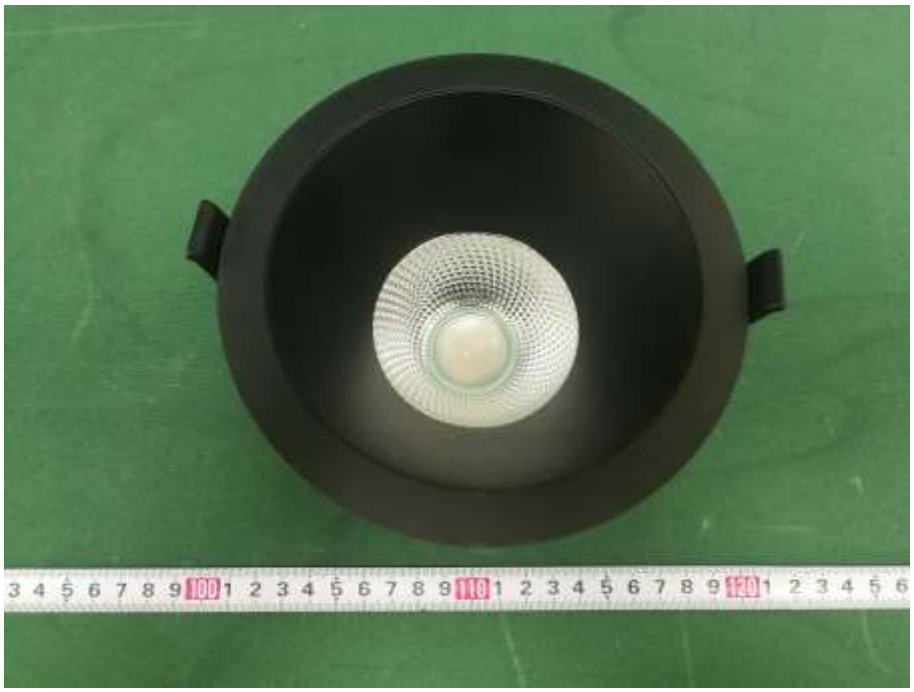
6 IDENTIFICATION OF THE EQUIPMENT UNDER TEST

EUT PHOTOS



7 ANNEX 1 - 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%.

Emission tests		**Uncertainty**	**Ucispr**
RF Conducted disturbance (mains port) 9 KHz – 30 MHz	AMN: R&S ENV216	3.24 dB	3.83 dB
RF Conducted disturbance (control terminals) using AAN (asymmetrical artificial network) method, 150 KHz – 30 MHz		4.04 dB 4.44 dB	4.20 dB 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		2.66 dB	2.89 dB
Radiated disturbance using CDNE, 30MHz – 300MHz		3.12 dB	3.79 dB
Radiated disturbance, 9 kHz – 30 MHz (triple loop)		2.62 dB	3.30 dB
Radiated disturbance, 30 MHz – 300 MHz (Horz.) ------- DEKRA SZ		3.60 dB	5.34 dB
Radiated disturbance, 300 MHz – 1000 MHz (Horz.) ------- DEKRA SZ		3.10 dB	
Radiated disturbance, 30 MHz – 300 MHz (Vert.) ------- DEKRA SZ		3.20 dB	6.32 dB
Radiated disturbance, 300 MHz – 1000 MHz (Vert.) ------- DEKRA SZ		3.20 dB	
LF harmonic current emissions		0.20 %	na
LF voltage fluctuations		2.50 %	na

Immunity tests	**Uncertainty**
Electrostatic discharge	U_{peak}=6%, U_{30ns}=6% U_{60ns}=6%, U_{rt}=13%
Radio-frequency electromagnetic fields------- DEKRA SZ	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%, $U_{r\text{-}d}$=3%

8 ANNEX 2 – USED EQUIPMENT

DEKRA SH:

Conducted disturbance				
Equipment	Manufacturer	Model No.	Serial No.	Cal. due date
EMI test receiver	R&S	ESCI	101351	2022/07/20
EMI test receiver	R&S	ESR3	102305	2022/07/20
Artificial Mains Network	R&S	ENV216	101620	2022/07/06
Artificial Mains Network	SCHWARZBECK	NSLK 8128	8128-287	2022/07/21
Asymmetric artificial network	SCHWARZBECK	NTFM8131	8131-151	2022/07/06
Asymmetric artificial network	TESEQ	ISN T800	30306	2022/07/28
High power voltage probe	SCHWARZBECK	TK9421	#308	2022/04/19
Capacitive voltage probe	TESEQ	CVP 2200A	43476	2022/07/27
Current probe	ETS.LINDGREN	91550-1L	218473	2022/07/06
Radiated disturbance-CDN/CDNE				
Equipment	Manufacturer	Model No.	Serial No.	Cal. due date
EMI test receiver	R&S	ESCI	101351	2022/07/20
EMI test receiver	R&S	ESR3	102305	2022/07/20
Coupling/Decoupling Network	SCHWARZBECK	CDNE M3	00088	2022/10/17
Coupling/Decoupling Network	SCHWARZBECK	CDNE M2	00110	2022/03/30
Coupling/Decoupling Network	TESEQ	CDN M016S	34640	2022/05/17
Radiated disturbance (9 kHz to 30 MHz)				
Equipment	Manufacturer	Model No.	Serial No.	Cal. due date
EMI test receiver	R&S	ESCI	101351	2022/07/20
EMI test receiver	R&S	ESR3	102305	2022/07/20
3-dimensional large loop antenna	SCHWARZBECK	HXYZ 9170	HXYZ9170-245	2022/07/06
Harmonic & Flicker				
Equipment	Manufacturer	Model No.	Serial No.	Cal. due date
Harmonic currents and flicker tester	California Instruments	CTS	1306A00135	2022/05/13
AC power source	California Instruments	5001iX-CTS-400	1306A00135	2022/05/13
Harmonic currents and flicker tester	TESEQ	Profline 2145	1736A02510	2022/08/09
ESD immunity				
Equipment	Manufacturer	Model No.	Serial No.	Cal. due date
ESD generator	TESEQ	NSG 435	6716	2022/04/27
ESD generator	TESEQ	NSG 437	1447	2022/07/02
EFT, Surge and V-Dips immunity				

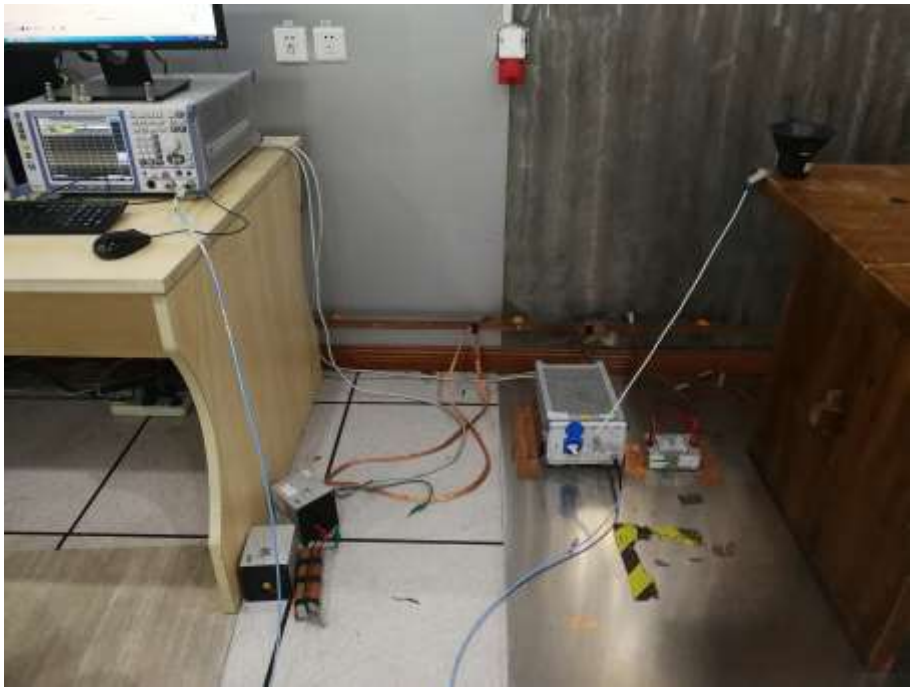
Equipment	Manufacturer	Model No.	Serial No.	Cal. due date
EFT, Surge, DIPS all-in-one	TESEQ	NSG-3040-MF	2006/EFT:0535 /SURGE:1234 /DIPS:2062	2022/05/12
Injected currents immunity				
Equipment	Manufacturer	Model No.	Serial No.	Cal. due date
Compact immunity test system (RF)	TESEQ	NSG 4070-30	35895	2022/05/12
Coupling decoupling network (CDN)	TESEQ	CDN M016S	34640	2022/05/17
Attenuator	TESEQ	ANT 6050	34847	2022/05/16

DEKRA SZ:

Radiated disturbance				
Equipment	Manufacturer	Model No.	Serial No.	Cal. due date
EMI Test Receiver	R&S	ESCI	100573	2022/03/04
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2022/06/09
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2022/02/28
Radio-frequency electromagnetic fields immunity				
Equipment	Manufacturer	Model No.	Serial No.	Cal. due date
Signal Generator	R&S	SMB100A	114728	2022/10/20
Power Meter	R&S	NRP2	106362	2022/10/20
Power Sensor	R&S	NRP6A	101411	2022/10/20
Power Sensor	R&S	NRP6B	101412	2022/10/20
RF Switch	R&S	OPS120	101944	2022/11/15
Power Amplifier	R&S	BBA150 BC500	102912	2022/01/24
Power Amplifier	R&S	BBA150 D200	102889	N/A
Power Amplifier	R&S	BBA150 E200	102890	N/A
LOG Antenna	R&S	HL046E	100257	N/A
LOG Antenna	R&S	STLP9149	9149-505	N/A
Filed Probe	AR	FL7006/KIT	350261	2022/09/19
Power frequency magnetic field immunity				
Equipment	Manufacturer	Model No.	Serial No.	Cal. due date
Immunity test system	Teseq GmbH	NSG 3060	4019	2022/03/21
CDN	Teseq GmbH	CDN 3061	5010	2022/03/21
Automatic step transformer	Teseq GmbH	VAR 3005-S16	3010	2022/04/20
Magnetic field Coil	Teseq GmbH	INA 702	306	2022/07/20
Magnetic field Generator	Teseq GmbH	MFO 6502	201	2022/07/20

9 ANNEX 3 – TEST PHOTOS

Conducted disturbance at electric power supply interface



Radiated disturbances (9 kHz to 30 MHz)

Radiated disturbances-CDNE (30 MHz to 300 MHz)

Harmonic current emissions

Radiated EM Field Immunity

Electrostatic discharge immunity

Electrical fast transient (EFT) / Burst transients / Surge transients / Power supply voltage interruptions & dips immunity

Conducted RF disturbances immunity

10 ANNEX 4 – MODEL LIST

Model name	Rating input	Rating power	LED driver
DR-M 068	220 – 240 V~; 50/60 Hz	6 W	NDF007HTEA085-C3VY
DR-M 090	220 – 240 V~; 50/60 Hz	9 W	NDF010HTEA115-C3VW
DT090	220 – 240 V~; 50/60 Hz	10 W	NDF010HTEA115-C3VW
DRT090	220 – 240 V~; 50/60 Hz	10 W	NDF010HTEA115-C3WE
DT120	220 – 240 V~; 50/60 Hz	14 W	NH012N0160T-MH069
DRT120	220 – 240 V~; 50/60 Hz	15 W	NH012N0160T-MH079
DT135	220 – 240 V~; 50/60 Hz	18 W	NDF006HTEA075-C3AB
DRT145	220 – 240 V~; 50/60 Hz	15 W	NDL006HCEA075-C3BA
DT170	220 – 240 V~; 50/60 Hz	20 W	NDF009HTEA115-C3AC
DT195	220 – 240 V~; 50/60 Hz	20 W	NDF009HCEA195-C3BC
DRT195	220 – 240 V~; 50/60 Hz	20 W	NDL006HCEA195-C3BA
DZ-M120	220 – 240 V~; 50/60 Hz	15 W	NDF007HCEA075-C3VW
DZ-M150	220 – 240 V~; 50/60 Hz	22 W	NDF006HCEA115-C3VY

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