


CENTER FOR TESTING AND EUROPEAN CERTIFICATION LTD

2, Industrialna Str., Stara Zagora, 6000, Bulgaria,
Tel.: +359 42 630476; +359 42 620368; Fax: +359 42 602377;
www.ctec-sz.com e-mail: ctec@ctec-sz.com


LABORATORY FOR TESTING OF MACHINERY, EQUIPMENT AND DEVICES

Certificate of accreditation № 101 ЛИ / 22.11.2019, valid until: 26.11.2022
Issued by EA BAS, in accordance with the requirements of BDS EN ISO/IEC 17025:2018



TEST REPORT

№ 2emc-21-624/28.09.2021

OBJECT TO BE TESTED: Electric and electronic equipment, appliances, devices. Luminaries.
Lighting fixture, Item: LED UFO Professional 200W 6500K
Model representative of serie: LED UFO Professional (see page 2)
(name of object to be tested , type, model, quantity, type and other)

APPLICANT FOR TEST: "Electrostart" JSCo. 3540 Varshets, 2 Republika Blvd.,
Tel.: +359 2 400 7011, fax: + 359 2 400 7012;
Application № 624/ 28.07.2021
(name of the firm – applicant, address, telephone, number and date of the test application)

METHOD OF TEST :

BDS EN IEC 55015:2019 Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment.
BDS EN IEC 61000-3-2:2019 Electromagnetic compatibility (EMC).
Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16 A per phase).
BDS EN 61000-3-3:2013+A1:2019 Electromagnetic compatibility (EMC).
Part 3-3: Limits - 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.
BDS EN 61547:2010 Equipment for general lighting purposes - EMC immunity requirements
BDS EN 61000-4-2:2009 Electromagnetic compatibility (EMC).
Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test
BDS EN 61000-4-8:2010 Electromagnetic compatibility (EMC).
Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test
BDS EN IEC 61000-4-11:2020 Electromagnetic compatibility (EMC).
Part 4-11: Testing and measurement techniques–Voltage dips, short interruptions and voltage variations immunity tests
(number and name of the standards)

DATE OF ACCEPTANCE IN THE TEST LABORATORY: 28.07.2021

CODE OF THE OBJECT: 1 piece, year of production 2021

MANUFACTURER: "Electrostart" JSCo. 3540 Varshets, 2 Republika Blvd.,
Tel.: +359 2 400 7011, fax: + 359 2 400 7012
(firm, trade mark, address)

DECLARED TECHNICAL DATA: Rated voltage – 220-240 V AC
Rated frequency – 50/60 Hz
Rated power – 200 W
Class I

ELECTRONIC CONTROLGEAR: LED Driver UFO 200W 700-1000 mA tc: 90°C Electrostart

DATE OF TEST PERFORMANCE: 28.07.2021 – 28.09.2021

THE HEAD OF LABORATORY:
/ T. Hristov /



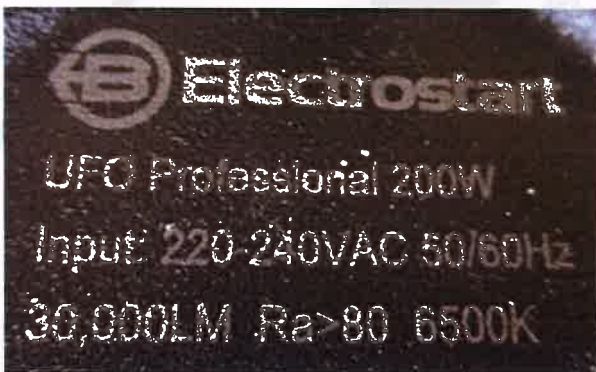
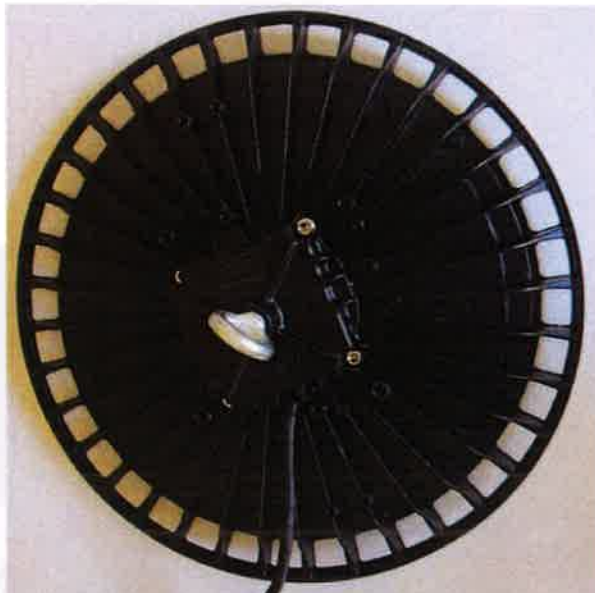
Serie: LED UFO Professional	
LED UFO Professional 100W 3000K FF 60 Degrees	LED UFO Professional 150W 3000K FF 60 Degrees Dim
LED UFO Professional 100W 3000K FF 90 Degrees	LED UFO Professional 150W 3000K FF 90 Degrees Dim
LED UFO Professional 100W 3000K FF 120 Degrees	LED UFO Professional 150W 3000K FF 120 Degrees Dim
LED UFO Professional 100W 4000K FF 60 Degrees	LED UFO Professional 150W 4000K FF 60 Degrees Dim
LED UFO Professional 100W 4000K FF 90 Degrees	LED UFO Professional 150W 4000K FF 90 Degrees Dim
LED UFO Professional 100W 4000K FF 120 Degrees	LED UFO Professional 150W 4000K FF 120 Degrees Dim
LED UFO Professional 100W 6500K FF 60 Degrees	LED UFO Professional 150W 6500K FF 60 Degrees Dim
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LED UFO Professional 100W 3000K FF 90 Degrees Dim	LED UFO Professional 200W 3000K FF 90 Degrees
LED UFO Professional 100W 3000K FF 120 Degrees Dim	LED UFO Professional 200W 3000K FF 120 Degrees
LED UFO Professional 100W 4000K FF 60 Degrees Dim	LED UFO Professional 200W 4000K FF 60 Degrees
LED UFO Professional 100W 4000K FF 90 Degrees Dim	LED UFO Professional 200W 4000K FF 90 Degrees
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LED UFO Professional 150W 4000K FF 60 Degrees	LED UFO Professional 200W 4000K FF 60 Degrees Dim
LED UFO Professional 150W 4000K FF 90 Degrees	LED UFO Professional 200W 4000K FF 90 Degrees Dim
LED UFO Professional 150W 4000K FF 120 Degrees	LED UFO Professional 200W 4000K FF 120 Degrees Dim
LED UFO Professional 150W 6500K FF 60 Degrees	LED UFO Professional 200W 6500K FF 60 Degrees Dim
LED UFO Professional 150W 6500K FF 90 Degrees	LED UFO Professional 200W 6500K FF 90 Degrees Dim
LED UFO Professional 150W 6500K FF 120 Degrees	LED UFO Professional 200W 6500K FF 120 Degrees Dim




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Copy of identification table and/or photo of tested object



<p>LED Driver UFO 200W Power: 200W Max. 1.2A Input voltage: 220-240VAC Output voltage: 180-260V Irated: 700-1000mA (CC) Dimmable: No PF: ≥ 0.95 ta: 60°C tc: 90°C For LED modules only</p>	<p>Electrostart <small>STARTS UP THE LIGHT</small></p> <p>     IP65  Made in BG/EU</p>
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BDS EN IEC 55015:2019

Test report: № 2emc-21-624/28.09.2021

I. Emission of Radio disturbance characteristics of electrical lighting and similar equipment

1. Mains terminal disturbance voltage – 9kHz ÷ 30MHz

BDS EN 55015, cl. 4.3 – Disturbance voltage limits at mains terminals – Table 1

BDS EN 55015, cl. 5.3.2.1 – Application of the limits

BDS EN 55015, cl. 7 – Operating conditions for lighting equipment

BDS EN 55015, cl. 7.6 – Ambient temperature: 24 °C; Relative Humidity: 40 %.

BDS EN 55015, cl.8.3 – Measurement of disturbance voltages, at the mains terminals of luminaires

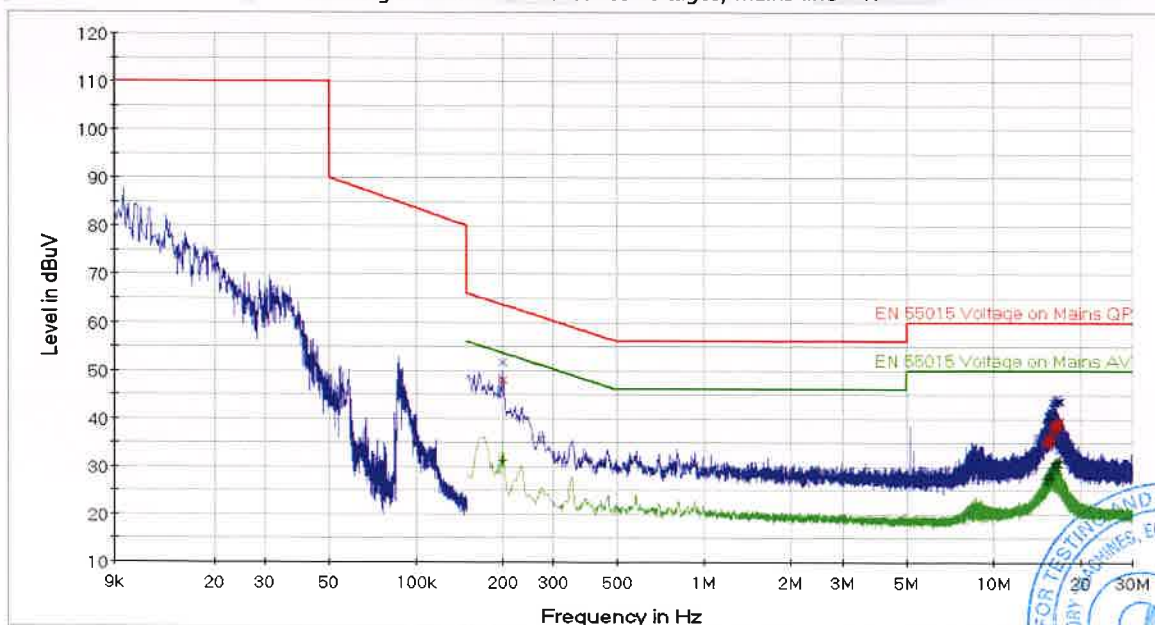
The test is performed at supply voltage: 230 V

Measurement uncertainty: 2,75 dB(μV)

RESULTS OF MEASUREMENT :

Frequency MHz	Terminal disturbance voltages, mains line – N					
	Quasi peak - QP			Average - AV		
	Measuring dB(μV)	Margin dB(μV)	Limit dB(μV)	Measuring dB(μV)	Margin dB(μV)	Limit dB(μV)
0,19950	48,1	15,5	63,6	31,2	22,4	53,6
15,30825	35,0	25,0	60,0	27,6	22,4	50,0
15,38025	34,6	25,4	60,0	26,5	23,5	50,0
15,49500	36,6	23,4	60,0	27,9	22,1	50,0
15,61650	35,0	25,0	60,0	27,8	22,2	50,0
15,69750	35,6	24,4	60,0	28,5	21,5	50,0
15,80325	35,8	24,2	60,0	28,7	21,3	50,0
15,88200	35,7	24,3	60,0	27,8	22,2	50,0
15,97650	35,1	24,9	60,0	27,3	22,7	50,0
16,08675	36,1	23,9	60,0	28,8	21,2	50,0
16,19025	38,8	21,2	60,0	30,0	20,0	50,0
16,29375	37,8	22,2	60,0	30,0	20,0	50,0
16,41300	38,3	21,7	60,0	31,0	19,0	50,0
16,50300	37,7	22,3	60,0	30,6	19,4	50,0
16,59300	38,7	21,3	60,0	30,7	19,3	50,0
16,70550	38,8	21,2	60,0	31,3	18,7	50,0
16,78425	39,1	20,9	60,0	29,6	20,4	50,0
16,89000	39,2	20,8	60,0	30,2	19,8	50,0
17,01600	39,7	20,3	60,0	31,5	18,5	50,0
17,11275	38,2	21,8	60,0	31,0	19,0	50,0

Drawing of terminal disturbance voltages, mains line – N



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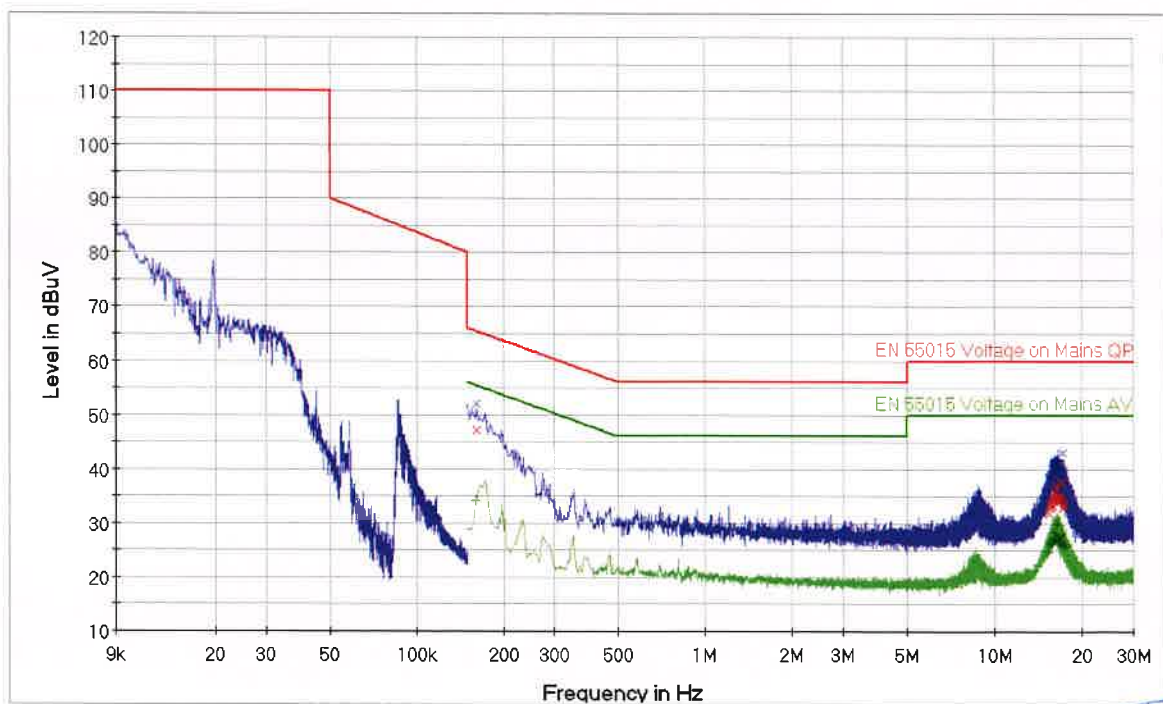
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BDS EN IEC 55015:2019

Test report: № 2emc-21-624/28.09.2021

Frequency	Terminal disturbance voltages, mains line - L					
	Quasi peak - QP			Average - AV		
	Measuring	Margin	Limit	Measuring	Margin	Limit
MHz	dB(μV)	dB(μV)	dB(μV)	dB(μV)	dB(μV)	dB(μV)
0,16125	47,2	18,2	65,4	34,3	21,1	55,4
15,40050	31,9	28,1	60,0	25,0	25,0	50,0
15,56925	33,5	26,5	60,0	26,8	23,2	50,0
15,68175	32,9	27,1	60,0	26,2	23,8	50,0
15,79650	33,3	26,7	60,0	26,3	23,7	50,0
15,90000	34,3	25,7	60,0	26,7	23,3	50,0
16,07550	35,9	24,1	60,0	28,5	21,5	50,0
16,20150	34,4	25,6	60,0	27,1	22,9	50,0
16,29600	34,9	25,1	60,0	27,4	22,6	50,0
16,36800	37,0	23,0	60,0	30,0	20,0	50,0
16,50075	34,6	25,4	60,0	27,1	22,9	50,0
16,59525	34,6	25,4	60,0	27,2	22,8	50,0
16,70100	34,8	25,2	60,0	27,1	22,9	50,0
16,79775	34,0	26,0	60,0	26,7	23,3	50,0
16,90575	34,4	25,6	60,0	26,9	23,1	50,0
17,00475	35,1	24,9	60,0	27,0	23,0	50,0
17,11725	37,6	22,4	60,0	28,1	21,9	50,0
17,19375	32,9	27,1	60,0	25,9	24,1	50,0
17,28825	33,7	26,3	60,0	26,4	23,6	50,0
17,48850	33,3	26,7	60,0	25,8	24,2	50,0

Drawing of terminal disturbance voltages, mains line – L



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BDS EN IEC 55015:2019

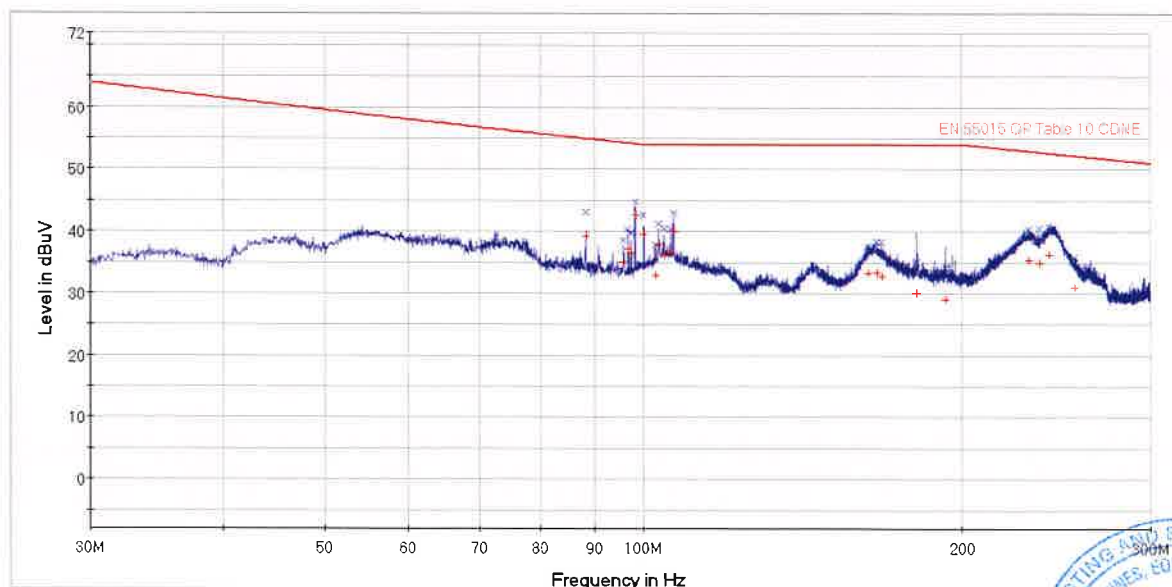
Test report: № 2emc-21-624/28.09.2021

2. Radiated electromagnetic disturbances – 30MHz ÷ 300MHz
 BDS EN 55015, cl. 4.5.3 –Limits - Table 10 – CDNE method
 BDS EN 55015, cl. 5.3.4.2 – Application of the limits
 BDS EN 55015, cl. 7 – Operating conditions for lighting equipment
 BDS EN 55015, cl. 7.6 – Ambient temperature: 24 °C ; Relative Humidity: 40 %.
 The test is performed at supply voltage: 230 V
 Measurement uncertainty: 3,05 dB(μV)

RESULTS OF MEASUREMENT :

Frequency	Radiated electromagnetic disturbances		
	Quasi peak - QP		
	Measuring	Margin	Measuring
MHz	dB(μV)	dB(μV)	dB(μV)
88,320	39,3	15,7	55,0
95,820	35,1	19,2	54,3
96,780	37,2	17,1	54,2
97,380	36,6	17,6	54,2
98,280	42,7	11,5	54,1
100,080	39,6	14,4	54,0
102,660	32,9	21,1	54,0
103,380	37,9	16,1	54,0
104,580	36,1	17,9	54,0
106,200	36,6	17,4	54,0
106,800	40,1	13,9	54,0
162,960	33,3	20,7	54,0
166,200	33,4	20,6	54,0
167,760	32,8	21,2	54,0
181,320	30,0	24,0	54,0
192,780	29,0	25,0	54,0
230,940	35,4	17,5	52,9
236,400	34,9	17,9	52,7
241,380	36,4	16,2	52,6
255,360	30,9	21,3	52,2

Drawina of Radiated electromagnetic disturbances



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BDS EN IEC 61000-3-2:2019

Test report: № 2emc-21-624/28.09.2021

2. HARMONIC CURRENT MEASUREMENT

Classification of equipment - C

Duration of test - 5 min; Measurement uncertainty: $\pm 7,1\%$ $V_{RMS} = 230,5 \text{ V}$ $I_{peak} = 1,370 \text{ A}$ $F = 49,987 \text{ Hz}$ $I_{RMS} = 0,880 \text{ A}$ $S = 202,8 \text{ VA}$ $P = 200,9 \text{ W}$

Crest Factor = 1,557

Power Factor = 0,990

THDi = 9,64 %

Harmonic	AVERAGE VALUES			MAX VALUE		
	Measured	100% Limit	% of Limit	Measured	150% Limit	% of Limit
№	, A	, A	%	, A	, A	%
2	0,0000	0,0177	0,0	0,0031	0,0266	11,7
3	0,0833	0,2630	31,7	0,0835	0,3945	21,2
5	0,0001	0,0884	0,1	0,0052	0,1326	3,9
7	0,0000	0,0619	0,0	0,0017	0,0929	1,8
9	0,0000	0,0442	0,0	0,0017	0,0663	2,6
11	0,0000	0,0265	0,0	0,0022	0,0398	5,5
13	0,0000	0,0265	0,0	0,0023	0,0398	5,8
15	0,0000	0,0265	0,0	0,0024	0,0398	6,0
17	0,0000	0,0265	0,0	0,0031	0,0398	7,8
19	0,0000	0,0265	0,0	0,0034	0,0398	8,6
21	0,0000	0,0265	0,0	0,0032	0,0398	8,1
23	0,0000	0,0265	0,0	0,0029	0,0398	7,3
25	0,0000	0,0265	0,0	0,0032	0,0398	8,1
27	0,0000	0,0265	0,0	0,0034	0,0398	8,6
29	0,0000	0,0265	0,0	0,0033	0,0398	8,3
31	0,0000	0,0265	0,0	0,0031	0,0398	7,8
33	0,0000	0,0265	0,0	0,0031	0,0398	7,8
35	0,0000	0,0265	0,0	0,0031	0,0398	7,8
37	0,0000	0,0265	0,0	0,0031	0,0398	7,8
39	0,0000	0,0265	0,0	0,0029	0,0398	7,3

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BDS EN IEC 61000-3-2:2019

Test report: № 2emc-21-624/28.09.2021

Harmonics of power supply source

Harmonic	Measured	100% Limit	% of Limit
№	V	V	%
2	0,123	0,461	26,6
3	0,025	2,074	1,2
4	0,025	0,461	5,3
5	0,000	0,922	0,0
6	0,000	0,461	0,0
7	0,000	0,691	0,0
8	0,000	0,461	0,0
9	0,000	0,461	0,0
10	0,000	0,461	0,0
11	0,000	0,230	0,0
12	0,000	0,230	0,0
13	0,000	0,230	0,0
14	0,000	0,230	0,0
15	0,000	0,230	0,0
16	0,000	0,230	0,0
17	0,000	0,230	0,0
18	0,000	0,230	0,0
19	0,000	0,230	0,0
20	0,000	0,230	0,0
21	0,000	0,230	0,0
22	0,000	0,230	0,0
23	0,000	0,230	0,0
24	0,000	0,230	0,0
25	0,000	0,230	0,0
26	0,000	0,230	0,0
27	0,000	0,230	0,0
28	0,000	0,230	0,0
29	0,000	0,230	0,0
30	0,000	0,230	0,0
31	0,000	0,230	0,0
32	0,000	0,230	0,0
33	0,000	0,230	0,0
34	0,000	0,230	0,0
35	0,000	0,230	0,0
36	0,000	0,230	0,0
37	0,000	0,230	0,0
38	0,000	0,230	0,0
39	0,000	0,230	0,0
40	0,000	0,230	0,0

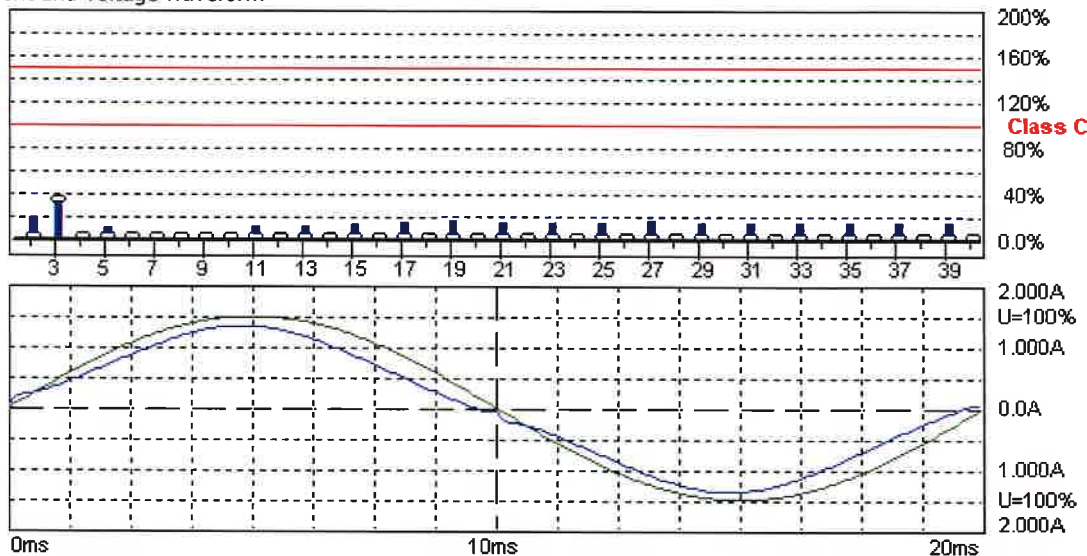
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Current and voltage waveform



Harmonic Emission - IEC 61000-3-2 , EN 61000-3-2 , (EN60555-2)

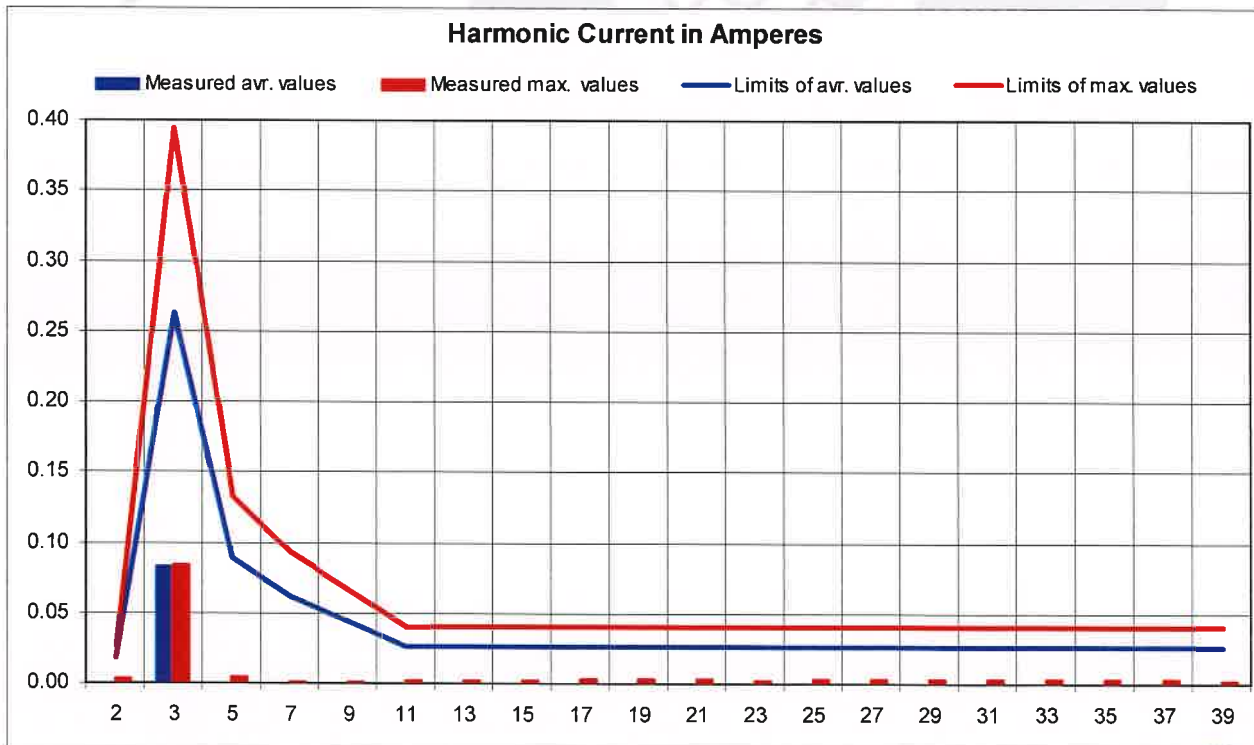
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Urms = 230.5 V	P = 200.9 W	THC = 0.084 A	Range: 2 A
Irms = 0.880 A	pf = 0.990	H1max = 0.884 A	V-nom: 229 V
			TestTime: 5 min (100%)

Test completed, Result: PASSED

HAR-1000 EMC-Parber

Graphics harmonics



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3. Voltage fluctuations and flicker measurement

EN 61000-3-3, cl. 4 – Assesment of voltage changes, voltage fluctuations and flicker

EN 61000-3-3, cl. 5 – Limits

EN 61000-3-3, cl. 6 – Test conditions

EN 61000-3-3, cl. 6.5 - Observation period

According to BDS EN 61000-3-3:2013+A1:2019 – Annex A, clause A.2

LED luminaires with ratings less than or equal to 200 W, are deemed to comply of limits in this standard and are not required to be tested





II. Immunity of Radio disturbance characteristics for general lighting purposes

BDS EN 61547 cl. 4.2 – Performance criteria for lighting equipment

Performance criterion A

During the test, no change of the Luminous intensity shall be observed and the regulating control, if any, shall operate during the test as intended.

Performance criterion 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 criterion C

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

Additional requirement for lighting equipment incorporating a starting device: After the test, the lighting equipment is switched off. After half an hour, it is switched on again. The lighting equipment shall start and operate as intended.

Environment requirements during the test	Ambient temperature	15 to 35 °C
	Relative Humidity	30 to 60 %
	Air pressure	860 to 1060 mbar
Test environment	Ambient temperature	24 °C
	Relative Humidity	40 %
	Air pressure	1010 mbar

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1. IMMUNITY TO ELECTROSTATIC DISCHARGE (ESD)

BDS EN 61547, τ. 5.2 – Electrostatic discharges – Table 1 - Test levels at enclosure port
 BDS EN 61000-4-2, τ. 7 – Test setup
 BDS EN 61000-4-2, τ. 7.2.2 – Table-top equipment , Figure 4
 BDS EN 61000-4-2, τ. 8 – Test procedure
 Measurement uncertainty: Tolerance of output voltage: ±5% ; Tolerance of the first peak of discharge current: ± 15%
 Deviation of current rise time: ±25% (0,6ns – 1ns); Current deviation measured at 30ns : ±30%
 Current deviation measured at 60ns : ±30%

Time interval between discharges	1 s
Discharge impedance	150 pF
Discharge impedance	330 Ω
Performance Criteria according to cl.6.3.4 and Table 15 of BDS EN 61547	Criteria B
Number of discharges	10 positive and 10 negative at the selected points

Discharge location	Type of discharge	Level	Test voltage	Polarity	Result
Body of luminaire - O	Air - Direct	1;2;3	2;4;8 kV	+	Criteria A
				-	
Body of luminaire - X	Contact - Direct	1;2	2;4 kV	+	Criteria A
				-	
Vertical coupling plane (VCP) - X	Contact - Indirect	1;2	2;4 kV	+	Criteria A
				-	
Horizontal coupling plane (HCP) - X	Contact - Indirect	1;2	2;4 kV	+	Criteria A
				-	

Picture of the object with marked points of discharge locations



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2. RATED POWER FREQUENCY MAGNETIC FIELD

BDS EN 61547, τ. 5.4 – Applicability ,Table 3

BDS EN 61000-4-8 τ. 7 – Test setup

BDS EN 61000-4-8 τ. 8 – Test procedure

Measurement uncertainty: Value of output current : $\leq 1\%$

Performance Criteria according to cl.6.3.4
and Table 15 of BDS EN 61547

Criteria A

Standard inductive coil	Orientation of standard inductive coil	Level	Field strength in the centre for all other inductive coils	Current in the coil (a coil with 10 windings)	Result
1 m x 1 m	X	2	3 A/m	3,45 A	Criteria A
1 m x 1 m	Y	2	3 A/m	3,45 A	Criteria A
1 m x 1 m	Z	2	3 A/m	3,45 A	Criteria A

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3. Voltage dips, short interruptions and voltage variations immunity tests

3.1 Voltage dips immunity tests

BDS EN 61547, τ. 5.8 – Applicability ,Table 11

BDS EN IEC 61000-4-11 τ. 7 – Test setup

BDS EN IEC 61000-4-11 τ. 8 – Test procedure

BDS EN IEC 61000-4-11 τ. 8.2.1 – Testing for each selected combination of test level and duration with a sequence of three dips with intervals of 10 s minimum (between each test event)

Measurement uncertainty: Deviation of output voltage : $\pm 5\%$

Performance Criteria according to cl.6.3.4 and Table 15 of BDS EN 61547

Criteria C

Voltage test levels (% of rated voltage)	Duration (cycles)	Phase angle synchronization	Result
70 %	10 cycles	0°	Criteria A

3.2 Short interruptions immunity tests

BDS EN 61547, τ. 5.8 – Applicability ,Table 12

BDS EN IEC 61000-4-11 τ. 7 – Test setup

BDS EN IEC 61000-4-11 τ. 8 – Test procedure

BDS EN IEC 61000-4-11 τ. 8.2.1 – Testing for each selected combination of test level and duration with a sequence of three interruptions with intervals of 10 s minimum (between each test event)

Measurement uncertainty: Deviation of output voltage : $\pm 5\%$

Performance Criteria according to cl.6.3.4 and Table 15 of BDS EN 61547

Criteria B

Voltage test levels (% of rated voltage)	Duration (cycles)	Phase angle synchronization	Result
0 %	0,5 cycles	0°	Criteria A

The results showed in present test report concern tested sample only

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**LABORATORY FOR TESTING OF MACHINERY, EQUIPMENT AND DEVICES
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Test report: № 2emc-21-624/28.09.2021

USED TECHNICAL EQUIPMENTS:

	Appliance	Type	Manufacturer	Identity №	Last calibration date
1.	EMI – receiver 9 kHz ÷ 3600 MHz	ESRP3	Rohde & Schwarz	1316.4500K03-102168- uT	15.01.2020
2.	Line impedance stabilisation networks	NNB 52	TESEQ Switzerland	26326	10.09.2020
3.	Coupling/Decoupling network	CDN M2+M3	Frankonia EMC Test - Systems	A2210229	10.09.2020
4.	System for measuring of harmonic current and flicker	HAR1000	EMC PARTNER	HAR1000-1P 230V- 0253	07.02.2020
5.	ESD - Generator	NSG438	TESEQ Switzerland	988	19.05.2021
6.	System for measuring voltage interruptions and dips, fast transients/burst and surge	IMU4000	EMC PARTNER	106754-2150	11.02.2020
7.	Digital multimeter	UNIGOR 390	LEM Austria	PI 3288	20.03.2020
8.	Power Quality Analyzer	435	Fluke Netherlands	DM 9881064	20.10.2020
9.	Thermometer-higrometer	177-H1	TESTO Germany	01320300/902	29.04.2021

TEST PERFORMER: 1. 

/ D. Chavalinov /

2. 

/ T. Hristov /

THE HEAD OF LABORATORY : 

/ T. Hristov /

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