



**LABORATORY FOR TESTING OF MACHINERY,
EQUIPMENT AND DEVICES**

CENTER FOR TESTING AND EUROPEAN CERTIFICATION LTD

2, Industrialna Str., Stara Zagora, Bulgaria,

Tel.: +359 42 620 368 Fax: +359 42 602 377 ctec@ctec-sz.com

TEST REPORT

№ 2emc-e-21-623 / 28.09.2021

OBJECT TO BE TESTED: Electric and electronic equipment, appliances, devices. Luminaries.
Lighting fixture, Item: LED Glow Economy 40W 120lm/W D66 External 4000K
Model representative of serie: LED Glow Economy (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 № 623/ 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 61547:2010 Equipment for general lighting purposes - EMC immunity requirements
BDS EN 61000-4-4:2012 Electromagnetic compatibility (EMC).
Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test
BDS EN 61000-4-5:2014+A1:2018 Electromagnetic compatibility (EMC).
Part 4-5: Testing and measurement techniques - Surge immunity test
BDS EN 61000-4-6:2014 Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields
(number and name of the standards)

DATE OF ACCEPTANCE IN THE TEST LABORATORY: 28.07.2021

CODE OF THE OBJECT: 1 piece, ref.№ 981240120042158, 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 – 40 W
Class II

ELECTRONIC CONTROL GEAR: 40W LED Driver 1000 mA, ref.№ 17020000000112 Electrostart

DATE OF TEST PERFORMANCE: 28.07.2021 – 28.09.2021

THE HEAD OF LABORATORY:
/ T. Hristov /



**LABORATORY FOR TESTING OF MACHINERY, EQUIPMENT AND DEVICES
CENTER FOR TESTING AND EUROPEAN CERTIFICATION LTD – Stara Zagora**

Page 2 of 11

Test report : № 2emc-e-21-623/28.09.2021

Serie: LED Glow Economy

LED Glow Economy 36W D66 100lm/W 3000K	LED Glow Economy 36W D312 100lm/W 3000K
LED Glow Economy 36W D66 100lm/W 4000K	LED Glow Economy 36W D312 100lm/W 4000K
LED Glow Economy 36W D66 100lm/W 6500K	LED Glow Economy 36W D312 100lm/W 6500K
LED Glow Economy 36W D66 120lm/W 3000K	LED Glow Economy 36W D312 120lm/W 3000K
LED Glow Economy 36W D66 120lm/W 4000K	LED Glow Economy 36W D312 120lm/W 4000K
LED Glow Economy 36W D66 120lm/W 6500K	LED Glow Economy 36W D312 120lm/W 6500K
LED Glow Economy 40W D66 100lm/W 3000K	LED Glow Economy 40W D312 100lm/W 3000K
LED Glow Economy 40W D66 100lm/W 4000K	LED Glow Economy 40W D312 100lm/W 4000K
LED Glow Economy 40W D66 100lm/W 6500K	LED Glow Economy 40W D312 100lm/W 6500K
LED Glow Economy 40W D66 120lm/W 3000K	LED Glow Economy 40W D312 120lm/W 3000K
LED Glow Economy 40W D66 120lm/W 4000K	LED Glow Economy 40W D312 120lm/W 4000K
LED Glow Economy 40W D66 120lm/W 6500K	LED Glow Economy 40W D312 120lm/W 6500K
LED Glow Economy 36W 100lm/W D66 UGR 3000K	LED Glow Economy 36W D312 100lm/W UGR 3000K
LED Glow Economy 36W 100lm/W D66 UGR 4000K	LED Glow Economy 36W D312 100lm/W UGR 4000K
LED Glow Economy 36W 100lm/W D66 UGR 6500K	LED Glow Economy 36W D312 100lm/W UGR 6500K
LED Glow Economy 40W 120lm/W D66 UGR 3000K	LED Glow Economy 36W D312 120lm/W UGR 3000K
LED Glow Economy 36W 120lm/W D66 UGR 4000K	LED Glow Economy 36W D312 120lm/W UGR 4000K
LED Glow Economy 40W 120lm/W D66 UGR 6500K	LED Glow Economy 36W D312 120lm/W UGR 6500K
	LED Glow Economy 40W D312 100lm/W UGR 3000K
	LED Glow Economy 40W D312 100lm/W UGR 4000K
	LED Glow Economy 40W D312 100lm/W UGR 6500K
	LED Glow Economy 40W D312 120lm/W UGR 3000K
	LED Glow Economy 40W D312 120lm/W UGR 4000K
	LED Glow Economy 40W D312 120lm/W UGR 6500K

*The results showed in present test report concern tested sample only
The test report could be reproduced as a whole only and after written permission of the laboratory*



Copy of identification table and/or photo of tested object



The results showed in present test report concern tested sample only
The test report could be reproduced as a whole only and after written permission of the laboratory





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

1. Radiated electromagnetic disturbances – 9kHz ÷ 30MHz

BDS EN 55015, cl. 4.4 – Radiated electromagnetic disturbances, limits – Table 3

BDS EN 55015, cl. 5.3.4.1 – 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 %.

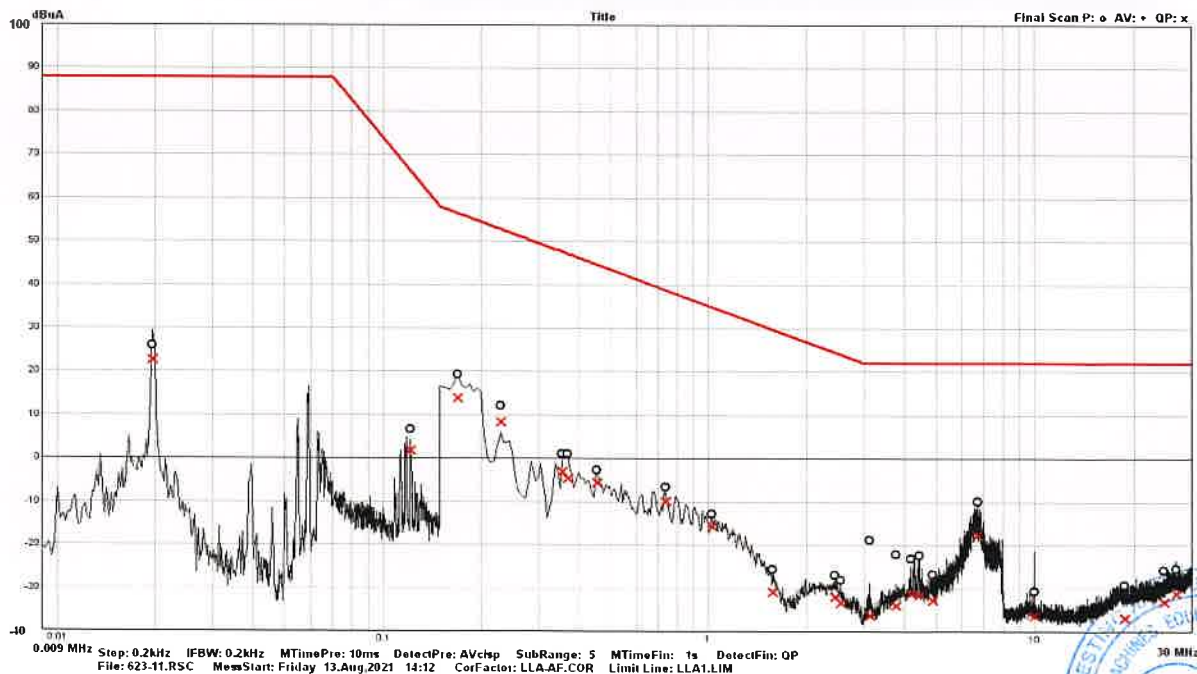
BDS EN 55015, cl.9.3.2 – Measuring radiated electromagnetic disturbances

The test is performed at supply voltage: 230 V

RESULTS OF MEASUREMENT :

Frequency MHz	Radiated electromagnetic disturbances - measured along the axis - X		
	Quasi peak - QP		
	Measuring dB(µA)	Margin dB(µA)	Limit dB(µA)
0,1700	13,85	42,64	56,49
0,2300	8,41	44,45	52,86
0,3550	-2,96	50,60	47,64
0,3700	-4,55	51,70	47,15
0,4550	-5,66	50,32	44,66
0,7400	-9,94	48,76	38,82
1,0250	-15,77	50,67	34,90
2,4300	-32,02	56,55	24,53
2,5350	-33,43	57,45	24,02
3,1100	-36,28	58,28	22,00
3,7450	-33,93	55,93	22,00
4,1800	-31,32	53,32	22,00
4,4250	-31,42	53,42	22,00
4,8650	-32,76	54,76	22,00
6,7100	-17,71	39,71	22,00
24,6200	-33,25	55,25	22,00
26,8100	-31,20	53,20	22,00

Drawing of Radiated electromagnetic disturbances - measured along the axis - X



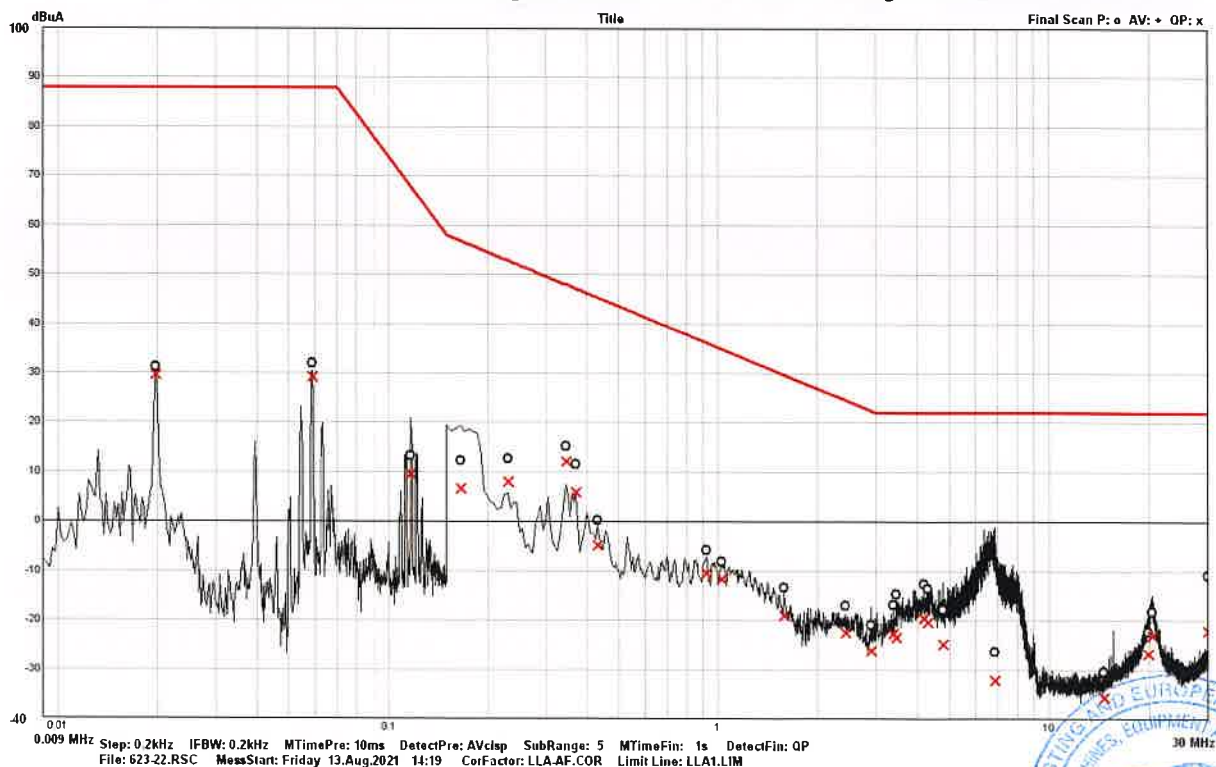
*The results showed in present test report concern tested sample only
The test report could be reproduced as a whole only and after written permission of the laboratory*





Frequency	Radiated electromagnetic disturbances - measured along the axis - Y		
	Quasi peak - QP		
	Measuring	Margin	Measuring
MHz	dB(μA)	dB(μA)	dB(μA)
0,0198	29,62	58,38	88,00
0,0590	29,14	58,86	88,00
0,1172	9,63	58,08	67,71
0,1650	6,76	50,09	56,85
0,2300	8,03	44,83	52,86
0,3450	12,04	35,95	47,99
0,3700	5,84	41,31	47,15
0,4300	-4,86	50,20	45,34
0,9200	-10,52	46,72	36,20
1,0250	-11,62	46,52	34,90
1,5850	-19,08	48,74	29,66
2,4150	-22,58	47,18	24,60
2,8950	-26,24	48,66	22,42
3,3850	-22,64	44,64	22,00
3,4550	-23,47	45,47	22,00
4,1850	-19,68	41,68	22,00
4,2950	-20,36	42,36	22,00
4,7650	-24,91	46,91	22,00
6,8350	-32,15	54,15	22,00
14,6400	-35,77	57,77	22,00
19,8800	-26,79	48,79	22,00
20,3250	-23,06	45,06	22,00
30,0000	-22,07	44,07	22,00

Drawing of Radiated electromagnetic disturbances - measured along the axis - Y



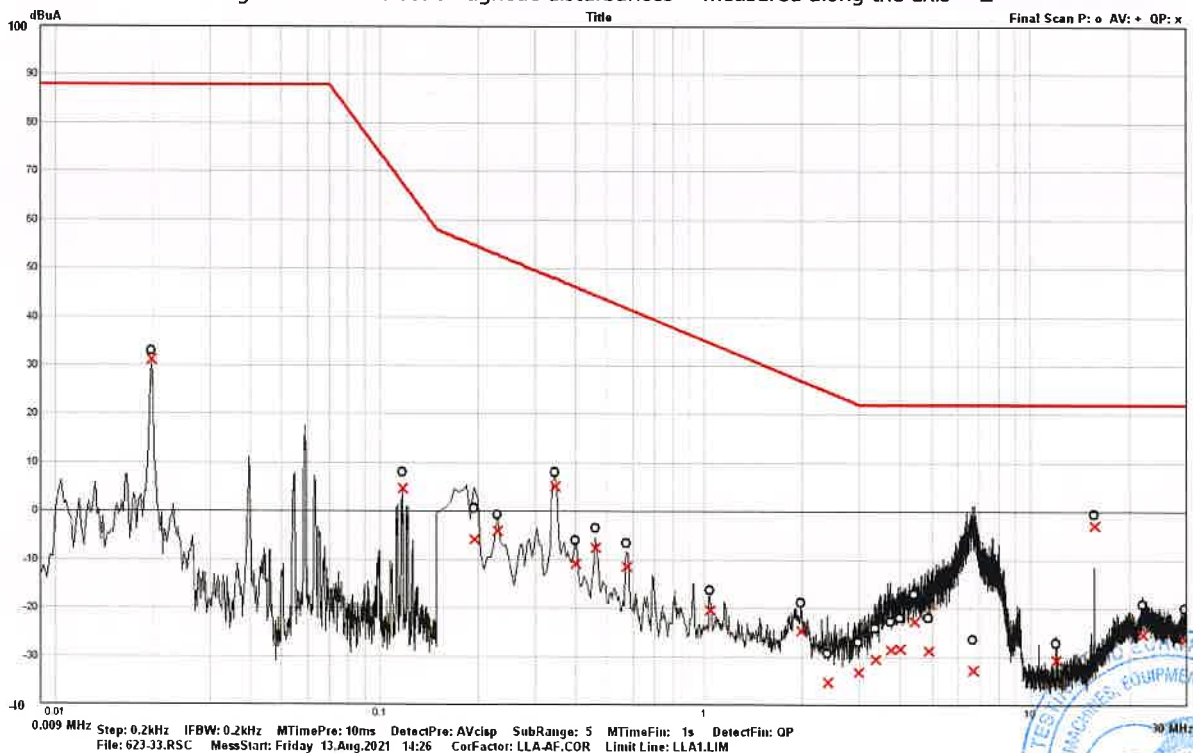
*The results showed in present test report concern tested sample only
The test report could be reproduced as a whole only and after written permission of the laboratory*





Frequency	Radiated electromagnetic disturbances - measured along the axis - Z		
	Quasi peak - QP		
	Measuring	Margin	Measuring
MHz	dB(μA)	dB(μA)	dB(μA)
0,155	12,57	45,03	57,60
0,220	-0,61	54,00	53,39
0,345	4,62	43,37	47,99
0,390	-2,49	49,00	46,51
0,465	-5,46	49,86	44,40
0,620	-8,72	49,66	40,94
1,475	-16,28	46,81	30,53
1,920	-21,42	48,78	27,36
2,030	-22,71	49,40	26,69
2,795	-21,97	44,82	22,85
3,240	-20,68	42,68	22,00
3,715	-18,51	40,51	22,00
3,965	-19,39	41,39	22,00
4,545	-21,06	3,06	22,00
4,670	-20,60	42,60	22,00
9,665	-29,48	51,48	22,00
10,290	-32,73	54,73	22,00
19,700	-21,58	43,58	22,00
24,955	-16,86	38,86	22,00
25,120	-16,11	38,11	22,00

Drawing of Radiated electromagnetic disturbances - measured along the axis - Z



*The results showed in present test report concern tested sample only
The test report could be reproduced as a whole only and after written permission of the laboratory*





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

*The results showed in present test report concern tested sample only
The test report could be reproduced as a whole only and after written permission of the laboratory*





1. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

BDS EN 61547, τ. 5.5 – Applicability, Table 6

BDS EN 61000-4-4, τ. 7 – Test setup

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

Rise time	5 ns ± 30 %
Duration	50 ns ± 30 %
Repetition frequency	5 kHz
Burst duration	15 ms ± 20 % за 5 kHz
Burst period	300 ms ± 20 %
Time of application	1 min for each polarity and coupling
Performance Criteria according to cl.6.3.4 and Table 15 of BDS EN 61547	Criteria B

Pulse Application	Application	Level	Test Voltage V	Polarity	Result
Between L and Ground plane	Coupling network	1	500	+	Criteria A
				-	Criteria A
		2	1000	+	Criteria A
				-	Criteria A
Between neutral and Ground plane	Coupling network	1	500	+	Criteria A
				-	Criteria A
		2	1000	+	Criteria A
				-	Criteria A
Between L, neutral and Ground plane	Coupling network	1	500	+	Criteria A
				-	Criteria A
		2	1000	+	Criteria A
				-	Criteria A

Signal lines

Pulse Application	Application	Level	Test Voltage V	Polarity	Result
-	Coupling clamp	1	500	+	-
				-	-
-	Coupling clamp	2	1000	+	-
				-	-

Control lines

Pulse Application	Application	Level	Test Voltage V	Polarity	Result
-	Coupling clamp	1	500	+	-
				-	-
-	Coupling clamp	2	1000	+	-
				-	-

*The results showed in present test report concern tested sample only
The test report could be reproduced as a whole only and after written permission of the laboratory*





2. SURGE IMMUNITY TEST

BDS EN 61547, τ. 5.7 – Applicability ,Table 10
 BDS EN 61000-4-5, τ. 7 – Test setup
 BDS EN 61000-4-2, τ. 8 – Test procedure

Front time	1,2 μs ± 30 %	
Time to half value	50 μs ± 20 %	
Source impedance	Power line symmetrical Power line unsymmetrical	2 Ω + 18 μF 12 Ω + 9 μF
Phase angles	90°/ 270°	
Number of surges / polarity /phase angle	5	
Performance Criteria according to cl.6.3.4 and Table 15 of BDS EN 61547	Criteria C	

Power line symmetrical

Pulse Application	Level	Test Voltage V	Polarity	Result
phase L – neutral N	1	500	+	Criteria A
			-	Criteria A
	2	1000	+	Criteria A
			-	Criteria A

Power line unsymmetrical

Pulse Application	Level	Test Voltage V	Polarity	Result
phase L – protective earth	1	500	+	-
			-	-
	2	1000	+	-
			-	-
	3	2000	+	-
			-	-
neutral N – protective earth	1	500	+	-
			-	-
	2	1000	+	-
			-	-
	3	2000	+	-
			-	-

*The results showed in present test report concern tested sample only
 The test report could be reproduced as a whole only and after written permission of the laboratory*





3. IMMUNITY TO CONDUCTED DISTURBANCES, INDUCED BY RADIO-FREQUENCY FIELDS

BDS EN 61547:2010, cl.5.6 – Injected currents (radio-frequency common mode) –Table 9 Input and output AC power ports
BDS EN 61000-4-6, cl. 7 – Test setup and injection method

BDS EN 61000-4-6, cl. 7.5 – CDN injection application

Frequency range	150 kHz – 80 MHz
Modulation	80% AM
Frequency of modulation	1 kHz
Frequency step size	1% of fundamental
Dwell time	1 s
Impedance	150 Ω
Performance Criteria according to cl.6.3.4 and Table 15 of BDS EN 61547	Criteria A

Ports	Coupling	Level	Amplitude	Result
Power port -AC	CDN-M3	2	3 V rms	Criteria A

*The results showed in present test report concern tested sample only
The test report could be reproduced as a whole only and after written permission of the laboratory*





Used technical equipments:

	Appliance	Type	Manufacturer	Identity №	Last calibration date
1.	Digital multimeter	UNIGOR 390	LEM Austria	PI 3288	20.03.2020
2.	Thermometer-higrometer	177-H1	TESTO Germany	01320300/902	29.04.2021
3.	EMI – receiver 9 kHz ÷ 3600 MHz	ESRP3	Rohde & Schwarz	1316.4500K03-102168- uT	15.01.2020
4.	Large loop antenna 2m	RF300	Laplace Instruments LTD U.K.	9123	12.03.2013
5.	System for measuring voltage interruptions and dips, fast transients/burst and surge	IMU4000	EMC PARTNER	106754-2150	11.02.2020
6.	Conductive disturbance test system	PMM 3010 PMM PA6002 CDN-M3	NARDA, Italy Schloder GmbH, Germany	050ZW00301 331ZT00211 20902425-0101	12.03.2020

TEST PERFORMER:

1.

/ D. Chavalinov /



2.

/ T. Hristov /

THE HEAD OF LABORATORY :

/ T. Hristov /