LABORATORY FOR TESTING OF MACHINERY, EQUIPMENT AND DEVICES

CENTER FOR TESTING AND EUROPEAN CERTIFICATION LTD

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TEST REPORT

№ 2emc-e-19-130 / 30.10.2019

OBJECT TO BE TESTED: Electric and electronic equipment, appliances, devices. Luminaries.
Lighting fixture type LED Edge panel, Model: LED Edge 48W PMMA 100lm/W 6500K, ref.№ 981148100064091
(name of obejct 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 № 130/ 03.07.2019
(name of the firm – applicant, address, telephone, number and date of the test application)

METHOD OF TEST :
BDS EN 55015:2013+A1:2015 Limits and methods of measurement of radio disturbance characteristicsof 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 Electromagnetic compatibility (EMC).
Part 4-5: Testing and measurement techniques - Surge immunity test
(number and name of the standards)

DATE OF ACCEPTANCE IN THE TEST LABORATORY: 03.07.2019

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

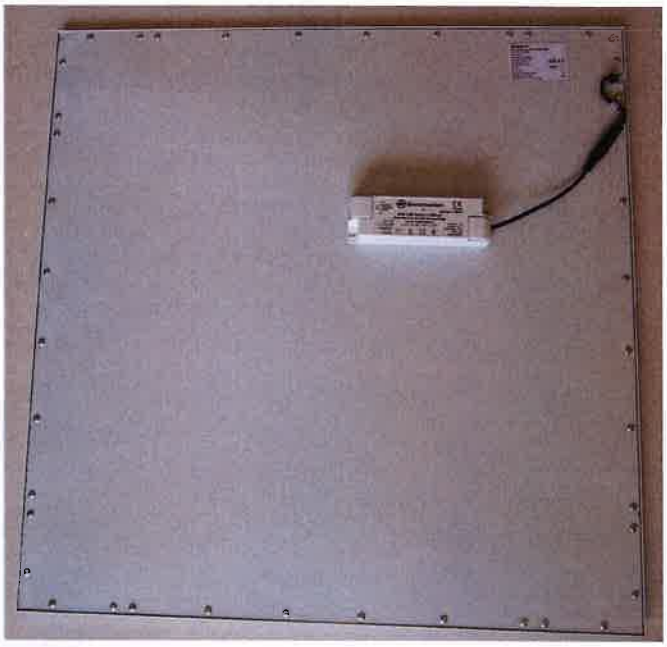
DECLARED TECHNICAL DATA: Rated voltage – 220-240 V AC
Rated frequency – 50-60 Hz
Rated power – 48 W
Class II

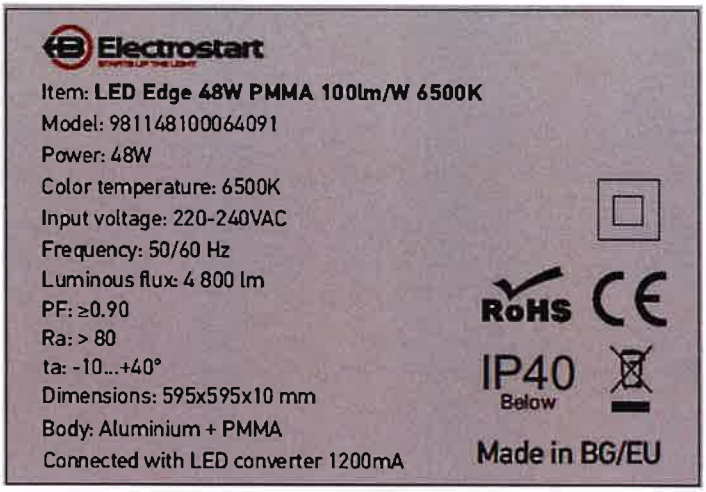
ELECTRONIC CONTROLGEAR: Electrostart 50W LED Driver 1200mA, ref.№ 170200000000034 ;

DATE OF TEST PERFORMANCE: 24.07.2019

THE HEAD OF LABORATORY: .....
/ T. Hristov /

Copy of identification table and/or photo of tested object





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

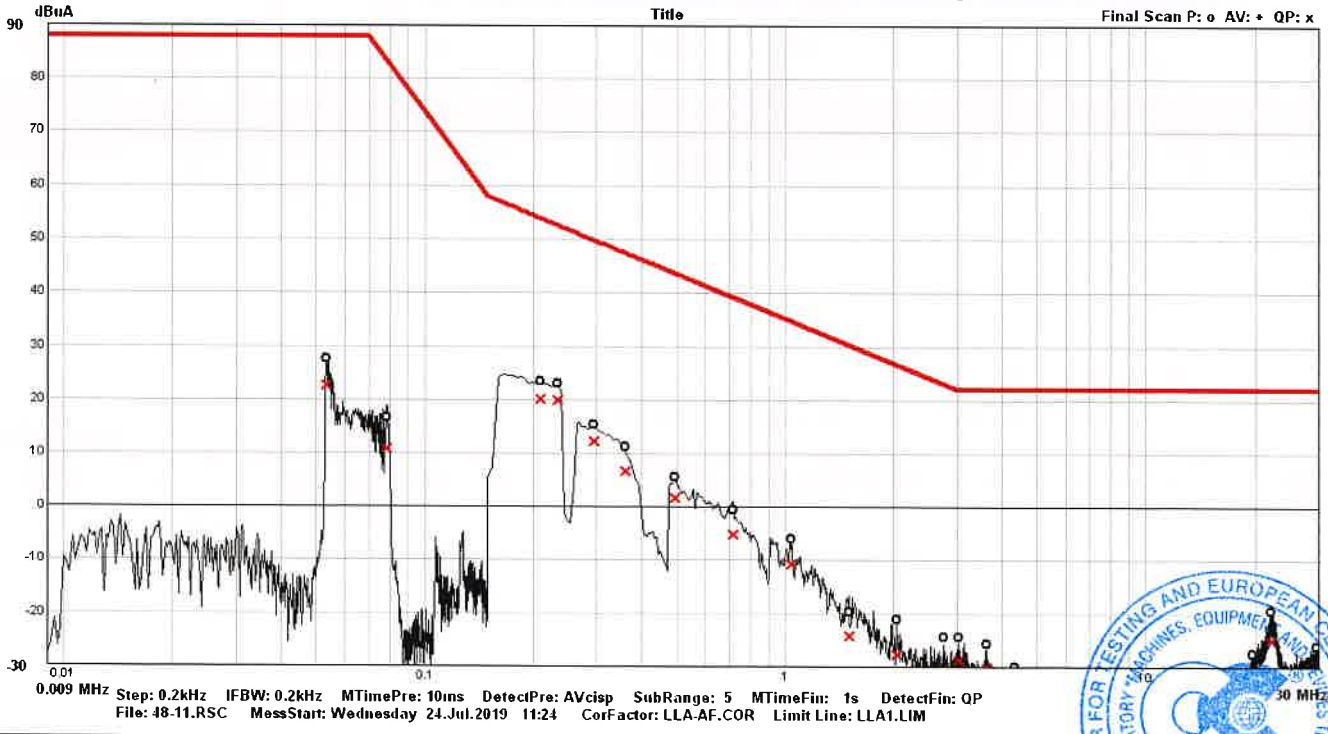
1. Radiated electromagnetic disturbances – 9kHz ÷ 30MHz

BDS EN 55015, cl. 4.4 – Radiated electromagnetic disturbances, limits – Table 3
BDS EN 55015, cl. 5.2.4 – Other luminaires
BDS EN 55015, cl. 6 – Operating conditions for lighting equipment
BDS EN 55015, cl. 6.4 – Ambient temperature: 25 °C ; Relative Humidity: 42 %.
BDS EN 55015, cl.9.1 – Measuring arrangement and procedure
BDS EN 55015, cl.9.2 – Indoor and outdoor luminaires
The test is performed at supply voltage: 230 V

RESULTS OF MEASUREMENT :

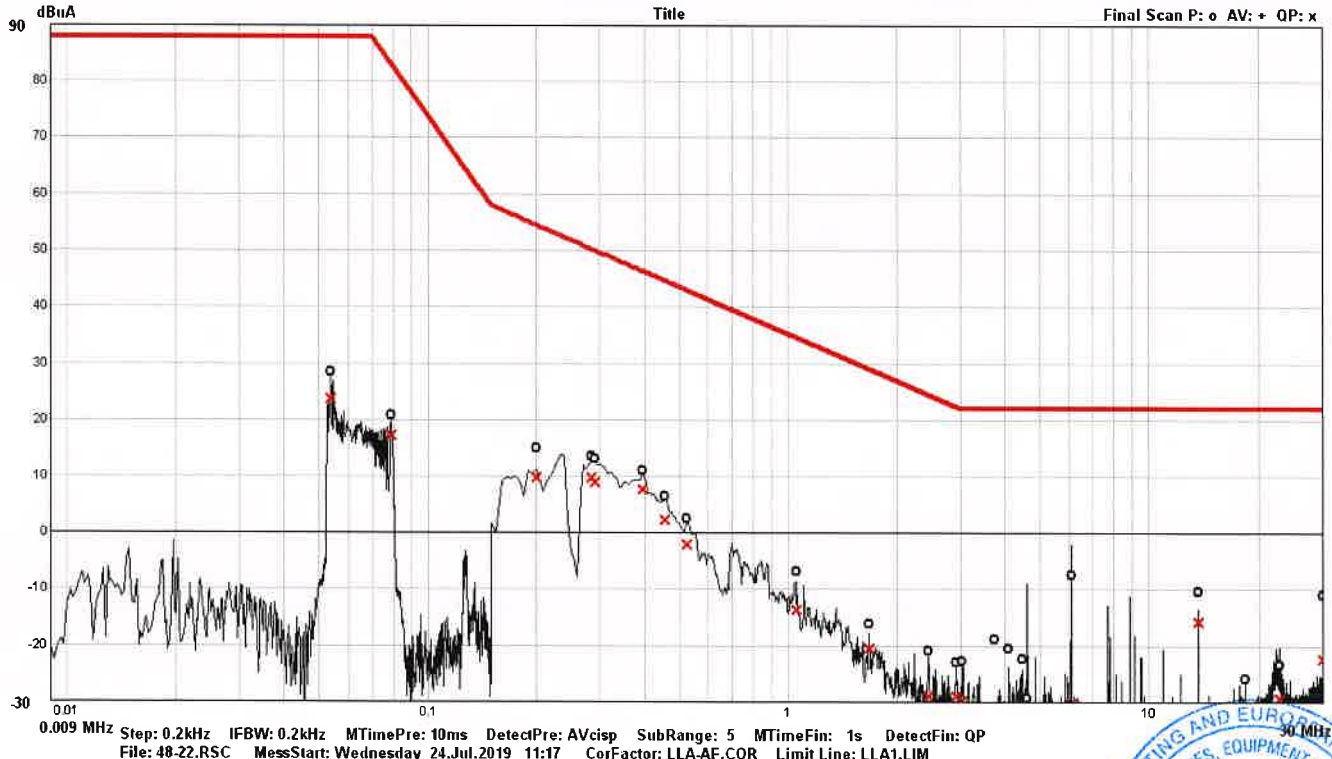
Frequency	Radiated electromagnetic disturbances - measured along the axis - X		
	Quasi peak - QP		
	Measuring	Margin	Limit
MHz	dB(μA)	dB(μA)	dB(μA)
0,053	22,62	65,38	88,00
0,078	10,76	72,77	83,53
0,210	20,10	33,85	53,95
0,235	19,89	32,71	52,60
0,295	12,28	37,59	49,87
0,360	6,66	40,81	47,47
0,495	1,72	41,93	43,65
0,715	-5,10	44,33	39,23
1,040	-10,68	45,41	34,73
1,505	-24,14	54,42	30,28
2,045	-27,73	54,33	26,60
2,745	-30,37	53,43	23,06
3,030	-28,78	50,78	22,00
3,630	-30,17	52,17	22,00
19,690	-33,85	55,85	22,00
22,110	-24,98	46,98	22,00

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



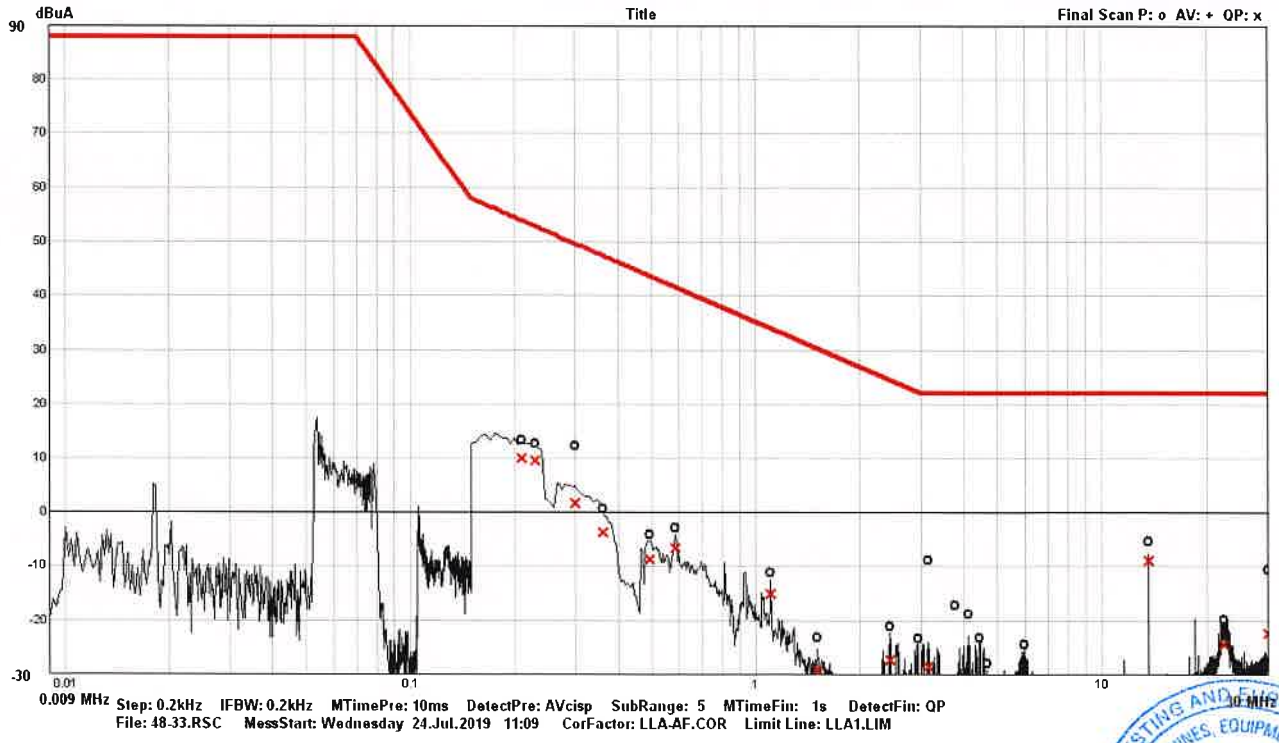
Frequency	Radiated electromagnetic disturbances - measured along the axis - Y		
	Quasi peak - QP		
	Measuring	Margin	Measuring
MHz	dB(μA)	dB(μA)	dB(μA)
0,054	23,67	64,33	88,00
0,079	17,26	66,07	83,33
0,200	9,84	44,70	54,54
0,285	9,77	40,51	50,28
0,290	8,97	41,10	50,07
0,395	7,69	38,67	46,36
0,455	2,30	42,36	44,66
0,525	-1,99	44,93	42,94
1,050	-13,72	48,33	34,61
1,675	-20,48	49,48	29,00
2,435	-28,97	53,47	24,50
2,920	-28,96	51,28	22,32
3,040	-29,87	51,87	22,00
13,635	-15,72	37,72	22,00
22,750	-29,36	51,36	22,00
30,000	-22,33	44,33	22,00

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



Frequency	Radiated electromagnetic disturbances - measured along the axis - Z		
	Quasi peak - QP		
	Measuring	Margin	Measuring
MHz	dB(μA)	dB(μA)	dB(μA)
0,210	9,99	43,96	53,95
0,230	9,59	43,27	52,86
0,300	1,70	47,97	49,67
0,360	-3,70	51,17	47,47
0,495	-8,58	52,23	43,65
0,585	-6,50	48,14	41,64
1,105	-15,06	49,06	34,00
1,510	-29,13	59,37	30,24
2,450	-27,32	51,75	24,43
2,935	-31,13	53,39	22,26
3,150	-28,48	50,48	22,00
4,440	-30,67	52,67	22,00
5,985	-32,75	54,75	22,00
13,635	-8,86	30,86	22,00
22,475	-24,41	46,41	22,00
30,000	-22,39	44,39	22,00

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



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 Iuminous intensity shall be observed and the regulating control, if any, shall operate during the test as intended.

Performance criterion B
During the test, the Iuminous intensity may change to any value. After the test, the Iuminous 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	25 °C
	Relative Humidity	42 %
	Air pressure	1010 mbar

1. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

BDS EN 61547, cl. 5.5 – Applicability ,Table 6
BDS EN 61000-4-4, cl. 7 – Test setup
BDS EN 61000-4-4, cl. 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	+	-
				-	-

2. SURGE IMMUNITY TEST

BDS EN 61547, cl. 5.7 – Applicability ,Table 10
BDS EN 61000-4-5, cl. 7 – Test setup
BDS EN 61000-4-2, cl. 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	+	Criteria A
			-	Criteria A
	2	1000	+	Criteria A
			-	Criteria A
	3	2000	+	Criteria A
			-	Criteria A
neutral N - protective earth	1	500	+	Criteria A
			-	Criteria A
	2	1000	+	Criteria A
			-	Criteria A
	3	2000	+	Criteria A
			-	Criteria A

Used technical equipments:

	Appliance	Type	Manufacturer	Identity №	Last calibration date
1.	EMI – receiver 9 kHz ÷ 1000 MHz	SCR 3501	Schaffner Electrotest GmbH, Germany	522	21.08.2017
2.	Large loop antenna 2m	RF300	Laplace Instruments LTD U.K.	9123	12.03.2013
3.	Digital multimeter	UNIGOR 390	LEM-Austria	PI 3288	20.03.2017
4.	Termometer-higrometer	177-H1	TESTO Germany	01320300/902	17.04.2018
5.	EFT/B - Generator	NSG/INA 2050 PNW 2225	Schaffner Electrotest GmbH, Germany	200906-578LU 200838-570LU	16.04.2015
6.	Surge - Generator	NSG/INA 2050 PNW 2050 CDN 133	Schaffner Electrotest GmbH, Germany	200906-578LU 200911-636LU 34464	16.04.2015

TEST PERFORMER: **1.** .....
/ D. Chavalinov /

CENTER FOR TESTING AND EUROPEAN CERTIFICATION LTD. LABORATORY MACHINES, EQUIPMENT AND DEVICES TESTING STARA ZAGORA

2. .....
/ T. Hristov /

THE HEAD OF LABORATORY :.....
/ T. Hristov /