

# Test Report

Client Name      Designlight Scandinavian AB

Address            : Toffelvägen 1, 342 60 Moheda

Product Name    : LED DRIVER

Date                : Apr. 29, 2021



## Shenzhen Anbotech Compliance Laboratory Limited

**TEST REPORT****IEC 61347- 2-13****Lamp controlgear –****Part 2-13: Particular requirements for d.c.or a.c. supplied  
electronic controlgear for LED modules****Report**

Report reference No. ....: 18240SC10009801

Tested by .....: Levi Wang

*Levi Wang*

Approved by .....: Jeff Zhu

*Jeff Zhu*

Date of issue .....: Apr. 29, 2021

Contents .....: 38 pages report

**Testing laboratory**

Name .....: Shenzhen Anbotech Compliance Laboratory Limited

Address .....: 1/F, Building D, Sogood Science and Technology Park, Sanwei  
community, Hangcheng Street, Bao'an District, Shenzhen,  
Guangdong, China. 518102

Testing location .....: Same as above

**Applicant**

Name .....: Designlight Scandinavian AB

Address .....: Toffelvägen 1, 342 60 Moheda

**Manufacturer**

Name .....: Designlight Scandinavian AB

Address .....: Toffelvägen 1, 342 60 Moheda

**Test specification**Standard .....: IEC 61347-2-13:2014+A1:2016 used in conjunction with  
IEC 61347-1:2015+A1:2017

Test procedure .....: Type test

Non-standard test method .....: N.A.

**Test item Description**

Product name .....: LED DRIVER

Trademark .....: N/A

Model and/or type reference .....: See report page 4

Rating(s) .....: Input: 200-240V, 50/60Hz, ta:40°C, tc:80°C

**Test item particulars**

Classification of installation and use ..... Independent  
 Supply connection ..... Supply cord without plug  
 Protection class ..... Class I

**Test case verdicts**

- test case does not apply to the test object ..... N (N.A.)  
 - test object does meet the requirement ..... P (Pass)  
 - test object does not meet the requirement ..... F (Fail)

**Testing**

Date of receipt of test item ..... Apr. 27, 2020  
 Date(s) of performance of tests ..... Apr. 27, 2020 to May 08, 2020

**General remarks**

This test report shall not be reproduced except in full without the written approval of the testing laboratory.

The test results presented in this report relate only to the item tested.

"(see remark #)" refers to a remark appended to the report.

"(see appended table)" refers to a table appended to the report.

Throughout this report a comma is used as the decimal separator.

According to the EU directives which have been aligned with EU NLF (new legislative framework), both of  
 manufacturer and importer's name and address shall be affixed on the product or, where that is not  
 possible, on its packaging or in a document accompanying the product before the product is placed  
 on the  
 EU market.

**Copy of marking plate(s)**

Formed as following:

**AC INPUT**

- AC LINE (BROWN)
- AC NEUTRAL (BLUE)
- GROUND (Y/G)



**DESIGNLIGHT**  
SCANDINAVIAN AB

Model: D-DC360W12D

**360W UNIVERSAL DIMMING LED DRIVER**

• Tc

- Input: 200-240VAC, 50/60Hz, 2.4A
- Output: 12V DC Constant Voltage, 30A Max, 360W Max
- Ta: 40°C, Tc: 80°C

Compatible with both leading edge and trailing edge AC dimmers

**12-VOLT  
OUTPUT**

- 12V+ (RED)
- 12V- (BLK)

**Remark:**

Rating label is attached on the top enclosure of Switch power supply

. (Size: height of WEEE mark at least 7mm, height of other marks at least 5mm, height of letters and numbers at least 2mm)





**General product information:**

-The product is designed as Class I Independent LED driver

Unless otherwise specified, model MDV360HH12 was chosen as representative models to perform all tests.

All models have the similar mechanical and electrical construction, main differences among them are size, wattage and current of output.

This test report is to supplement test report number 18240SC00007501.

**Summary of testing**

Tests performed

- EN 61347-1:2015

- EN 61347-2-13:2014+A1: 2017

- EN 62493:2015

The submitted samples were found to comply with the requirement of EN 62493:2015 without testing because they are LED-lightsource technology.

**The submitted samples were found to comply with the above specification.**

**List of Attachments**

Attachment : Photo documentation

**Model list:**

Model no	Output rating	Model no	Rating
D-DC6W12D	12VDC, 0.5A	D-DC6W24D	24VDC, 0.25A
D-DC12W12D	12VDC, 1A	D-DC12W24D	24VDC, 0.5A
D-DC15W12D	12VDC, 1.25A	D-DC15W24D	24VDC, 0.625A
D-DC18W12D	12VDC, 1.5A	D-DC18W24D	24VDC, 0.75A
D-DC20W12D	12VDC, 1.667A	D-DC20W24D	24VDC, 0.833A
D-DC24W12D	12VDC, 2A	D-DC24W24D	24VDC, 1A
D-DC30W12D	12VDC, 2.5A	D-DC30W24D	24VDC, 1.25A
D-DC36W12D	12VDC, 3A	D-DC36W24D	24VDC, 1.5A
D-DC40W12D	12VDC, 3.33A	D-DC40W24D	24VDC, 1.667A
D-DC45W12D	12VDC, 3.75A	D-DC45W24D	24VDC, 1.875A
D-DC50W12D	12VDC, 4.167A	D-DC50W24D	24VDC, 2.083A
D-DC60W12D	12VDC, 5A	D-DC60W24D	24VDC, 2.5A
D-DC80W12D	12VDC, 6.667A	D-DC80W24D	24VDC, 3.333A
D-DC100W12D	12VDC, 8.333A	D-DC100W24D	24VDC, 4.167A
D-DC120W12D	12VDC, 10A	D-DC120W24D	24VDC, 5A
D-DC150W12D	12VDC, 12.5A	D-DC150W24D	24VDC, 6.25A
D-DC200W12D	12VDC, 16.667A	D-DC200W24D	24VDC, 8.333A

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D-DC300W12D	12VDC, 25A	D-DC300W24D	24VDC, 12.5A
D-DC360W12D	12VDC, 30A	D-DC360W24D	24VDC, 15A
D-DC36W12D-2	12VDC, 3A	D-DC36W24D-2	24VDC, 1.5A
MDV360HH12	12VDC, 30A		

IEC 61347-2-13			
Clause	Requirement - Test	Result - Remark	Verdict
<b>4 (4)</b>	<b>GENERAL REQUIREMENTS</b>		—
- (4)	Insulation materials according requirements in Annex N of IEC 61347-1	(see Annex N)	P
- (4)	Compliance of independent controlgear enclosure with EN 60598-1		N
- (4)	Built-in magnetic ballast with double or reinforced insulation comply with Annex I of IEC 61347-1		N
- (4)	Built-in electronic controlgear with double or reinforced insulation comply with Annex O of IEC 61347-1	(see Annex O)	N
4 (4)	SELV controlgear comply with Annex I of this part 2 and Annex L of IEC 61347-1	(see Annex L)	P
4 (-)	Transformer comply with IEC 61558	(see Annex I)	P
	Dielectric strength test of insulated winding wires is limited to 3 kV if input voltage $\leq 300$ V		P

<b>6 (6)</b>	<b>CLASSIFICATION</b>		—
	Independent controlgear .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Built-in controlgear .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Integral controlgear .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
6 (-)	Auto-wound controlgear .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Separating controlgear .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Isolating controlgear .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	SELV controlgear .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—

<b>7 (7)</b>	<b>MARKING</b>		—
7.1 (7.1)	Mandatory markings		P
	a) mark of origin		P
	b) model number, type reference		P
	c) symbol for independent ballast, if applicable		P
	d) correlation between interchangeable parts and ballast marked		N
	e) rated supply voltage( V )	200-240VAC	P
	supply frequency (Hz)	50/60Hz	P
	supply current (A)	See model list	P
	f) earthing symbol		N

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IEC 61347-2-13			
Clause	Requirement - Test	Result - Remark	Verdict

	k) wiring diagram		P
	l) value of $t_c$		P
	m) symbol for declared temperature		N
	t) LUM earthing symbol		N
	u) if not SELV maximum working voltage $U_{out}$ between:		N
	- output terminals (V) .....		N
	- output terminals and earth (V) .....		N
7.1 (-)	Constant voltage type:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	- rated output power $P_{rated}$ (W) .....	360 Max.	P
	- rated output voltage $U_{rated}$ (V) .....	See model list	P
	Constant current type:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	- rated output power $P_{rated}$ (W) .....		N
	- rated output current $I_{rated}$ (A) .....		N
	- indication if for LED modules only		P
7.1 (7.2)	Marking durable and legible		P
	Rubbing 15 s water, 15 s petroleum; marking legible		P
7.2 (7.1)	- information to be provided, if applicable		P
	h) declaration on protection against accidental contact		P
	i) cross-section of conductors (mm <sup>2</sup> ):		P
	j) number, type and wattage of lamp(s)		N
	s) SELV symbol		P
7.2 (-)	- declaration of mains connected windings		N

<b>8 (10)</b>	<b>PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS</b>		—
- (10.1)	Controlgear protected against accidental contact with live parts.		P
- (A2)	Voltage measured with 50 k $\Omega$	(see Annex A)	P
- (A3)	Voltage > 35 V r.m.s. or > 60 V d.c. or protective impedance device		N
- (10.1)	Lacquer or enamel is not used for protection or insulation		N

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IEC 61347-2-13			
Clause	Requirement - Test	Result - Remark	Verdict
	Adequate mechanical strength on parts providing protection		N
- (10.2)	Capacitors > 0,5 $\mu$ F: voltage after 1 min (V): < 50 V: .....	0V after 1 min	P
- (10.3)	Controlgear providing SELV		P
	Accessible conductive parts are insulated from live parts by double or reinforced insulation in SELV controlgear		P
	No connection between output circuit and the body or protective earthing circuit		P
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		P
	SELV outputs separated by at least basic insulation		N
	ELV conductive parts insulated as live parts		N
	Tests according Annex L of IEC 61347-1		P
- (10.4)	Accessible conductive parts in SELV circuits		P
	Output voltage under load $\leq 25$ V r.m.s. or $\leq 60$ V d.c.		P
	If output voltage > 25 V r.m.s. or > 60 V d.c.; No load output $\leq 35$ V peak or $\leq 60$ V d.c. and touch current does not exceed 0,7 mA (peak) or 2 mA d.c.....		N
	One conductive part is insulated if output voltage or current exceeding the values above and withstand test voltage 500 V		N
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor		P
	Y1 or Y2 capacitors comply with IEC 60384-14		P
	Resistors comply with test (a) in 14.1 of IEC 60065		N

<b>9 (8)</b>	<b>TERMINALS</b>	
	Screw terminals according section 14 of IEC 60598-1:	N
	Separately approved; component list	(see Annex 1) N
	Part of the controlgear	(see Annex 2) N
	Screwless terminals according section 15 of IEC 60598-1:	N

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IEC 61347-2-13			
Clause	Requirement - Test	Result - Remark	Verdict
	Separately approved; component list	(see Annex 1)	N
	Part of the controlgear	(see Annex 3)	N
<b>10 (9)</b>	<b>PROVISION FOR EARTHING</b>		—
- (9.1)	Provisions for protective earthing		N
	Terminal complying with clause 8		N
	Locked against loosening and not possible to loosen by hand		N
	Not possible to loosen clamping means unintentionally on screwless terminals		N
	Earthing via means of fixing		N
	Earthing terminal only used for the earthing of the control gear		N
	All parts of material minimizing the danger of electrolytic corrosion		N
	Made of brass or equivalent material		N
	Contact surface bare metal		N
- (9.2)	Provision for functional earthing		N
	Comply with clause 8 and 9.1		N
- (9.3)	Earth contact via the track on the printed board		N
	Test with a current of 25 A between earthing terminal and each of the accessible metal parts; measured resistance ( $\Omega$ ) at $\geq 10$ A according 7.2.3 of IEC 60598-1: $< 0,5\Omega$ .....		N
- (9.4)	Earthing of built-in lamp controlgear		N
	Earth by means of fixing to earthed metal of luminaire in compliance of 7.2 of IEC 60598-1		N
	Earthing terminal only for earthing the built-in controlgear		N
- (9.5)	Earthing via independent controlgear		N
- (9.5.1)	Earth connection to other equipment		N
	Looping or through connection, conductor min. 1,5 mm <sup>2</sup> and of copper or equivalent		N
	Protective earthing wires in line with 5.3.1.1 and clause 7		N
- (9.5.2)	Earthing of the lamp compartments powered via the independent lamp controlgear		P

IEC 61347-2-13			
Clause	Requirement - Test	Result - Remark	Verdict
	Test with a current of 25 A between earthing terminal and each of the accessible metal parts; measured resistance ( $\Omega$ ) at $\geq 10$ A according 7.2.3 of IEC 60598-1: $< 0.5\Omega$ .....		N
	Output earthing terminal marked as in 7.1 t) of IEC 61347-1		N

<b>11 (11)</b>	<b>MOISTURE RESISTANCE AND INSULATION</b>		—
	After storage 48 h at 91-98% relative humidity and 20-30 °C measuring of insulation resistance with d.c. 500 V ( $M\Omega$ ): $> 2 M\Omega$ :		P
	$\geq 2 M\Omega$ for basic insulation .....	100M $\Omega$	P
	$\geq 4 M\Omega$ for double or reinforced insulation .....	100M $\Omega$	P
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		P
11(-)	Adequate insulation between input and output terminals not bounded together in SELV-equivalent controlgear		N

<b>12 (12)</b>	<b>ELECTRIC STRENGTH</b>		—
	Immediately after clause 11 electric strength test for 1 min		P
	Working voltage $\leq 50$ V, test voltage 500 V		N
	Working voltage $> 50$ V $\leq 1000$ V, test voltage (V):		P
	Basic insulation, 2U + 1000V	1480V	P
	Supplementary insulation, 2U + 1000V	1480V	P
	Double or reinforced insulation, test voltage (V) : 4U+2000V:	2960V	P
	No flashover or breakdown		P
	Solid or thin sheet insulation for double or reinforced insulation fulfil the requirements in Annex N in IEC 61347-1		N

<b>14 (14)</b>	<b>FAULT CONDITIONS</b>		P
- (14)	When operated under fault conditions the controlgear:		---
	- does not emit flames or molten material		P



IEC 61347-2-13			
Clause	Requirement - Test	Result - Remark	Verdict
	- does not produce flammable gases		P
	- protection against accidental contact not impaired		P
	Thermally protected controlgear does not exceed the marked temperature value		N
	Fault conditions: capacitors resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	P
- (14.1)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (except between live parts and accessible metal parts)	(see appended table)	N
	Creepage distances on printed boards less than specified in clause 16 in Part 1 provided with coating according to IEC 60664-3		N
- (14.2)	Short-circuit or interruption of semiconductor devices	(see appended table)	P
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile		N
- (14.4)	Short-circuit across electrolytic capacitors	(see appended table)	P
- (14.5)	After the tests has been carried out on three samples:		P
	The insulation resistance $\geq 1 \text{ M}\Omega$ ..... :	100 M $\Omega$	P
	No flammable gases		P
	No accessible parts have become live		P
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P
- (14.6)	Relevant fault condition tests with high-power supply		P
14 (-)	Temperature declared thermally protected lamp controlgear fulfil requirements in Annex C		N

<b>15(-)</b>	<b>TRANSFORMER HEATING</b>		—
15.1	General		P
	Transformer comply with clause L.6 and L.7 of IEC 61347-1		P
	Output voltage of SELV controlgear not exceed limits in 10.4 of IEC 61347-1 during the test of 15.1 and 15.2		P



IEC 61347-2-13			
Clause	Requirement - Test	Result - Remark	Verdict
15.2 (-)	Normal operation	(see appended table)	P
	Comply with clause L.6 of IEC 61347-1		P
15.3 (-)	Abnormal operation	(see appended table)	P
	Comply with clause L.7 of IEC 61347-1		P
	Double LED modules or equivalent load connected in parallel to the output terminals of constant voltage type		P
	Double LED modules or equivalent load connected in parallel to the output terminals of constant current type		N
15 (-)	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		P

<b>16 (15)</b>	<b>CONTURCTION</b>		—
- (15.1)	Wood, cotton, silk, paper and similar fibrous material		P
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
- (15.2)	Printed circuits		P
	Printed circuits used as internal connections complies with clause 14		P
- (15.3)	Plugs and socket-outlets used in SELV or ELV circuits		N
	No dangerous compatibility between output socket-outlet and a plug for socket-outlets for input circuit in relation to installation rules, voltages and frequencies		N
	Plugs and socket-outlets for SELV comply with IEC 60906-3 and IEC 60884-2-4		N
	Plugs and socket-outlets for SELV $\leq 3$ A, $\leq 25$ V r.m.s. or $\leq 60$ V d.c. and $\leq 72$ W comply with IEC 60906-3 and IEC 60884-2-4 or:		N
	- plugs not able to enter socket-outlets of other standardised system		N
	- socket-outlets not admit plugs of other standardised system		N
	- socket-outlets without protective earth		N
- (15.4)	Insulation between circuits and accessible parts		P
- (15.4.2)	SELV circuits		P
	Source used to supply SELV circuits:		P

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IEC 61347-2-13			
Clause	Requirement - Test	Result - Remark	Verdict
	- safety isolating transformer in accordance with relevant part 2 of IEC 61558		N
	- controlgear providing SELV in accordance with relevant part 2 of IEC 61347		P
	- another source		N
	Voltage in the circuit not higher than ELV		P
	SELV circuits insulated from LV by double or reinforced insulation		P
	SELV circuits insulated from non SELV circuits by double or reinforced insulation		N
	SELV circuits insulated from FELV circuits by supplementary insulation		N
	SELV circuits insulated from other SELV circuits by basic insulation		N
	SELV circuits insulated from accessible conductive parts according Table 6 in 15.4.5		P
- (15.4.3)	FELV circuits		N
	Source used to supply FELV circuits:		N
	- separating transformer in accordance with relevant part 2 of IEC 61558		N
	- separating controlgear providing basic insulation between input and output circuits in accordance with relevant part 2 of IEC 61347		N
	- another source		N
	- source in circuits separated by the LV supply by basic insulation		N
	Voltage in the circuit not higher than ELV		N
	FELV circuits insulated from LV supply by at least basic insulation		N
	FELV circuits insulated from other FELV circuits if functional purpose		N
	FELV circuits insulated from accessible conductive parts according Table 6 in 15.4.5		N
	Plugs and socket-outlets for FELV system comply with:		N
	- plugs not able to enter socket-outlets of other voltage systems		N
	- socket-outlets not admit plugs of other voltage systems		N



IEC 61347-2-13			
Clause	Requirement - Test	Result - Remark	Verdict
	- socket-outlets have a protective conductor contact		N
- (15.4.4)	Other circuits		N
	Insulation between circuits other than SELV or FELV and accessible conductive parts in according Table 6 in 15.4.5.		N
- (15.4.5)	Insulation between circuits and accessible conductive parts		P
	Accessible conductive parts insulated from active parts of electric circuits by insulating according Table 6		P
	Requirements for Class II construction with equipotential bonding for protection against indirect contact with live parts:		N
	- all conductive parts are connected together		N
	- conductive parts are reliably connected together according test of IEC 60598-1 cl. 7.2.3		N
	- conductive parts comply with requirements of Annex A in case of insulation fault		N

<b>17 (16)</b>	<b>CREEPAGE DISTANCES AND CLEARANCES</b>		—
- (16)	Creepage distances and clearances according to 16.2 and 16.3	(see appended table)	P
	Controlgears providing SELV comply with additional requirements in Annex L		P
	Insulating lining of metallic enclosures		P
	Controlgear protected against pollution comply with Annex P	(see Annex P)	P
- (16.2)	Creepage distances		P
- (16.2.2)	Minimum creepage distances for working voltages		P
	Creepage distances according to Table 7	(see appended table)	P
- (16.2.3)	Creepage distances for working voltages with frequencies above 30 kHz		N
	Creepage distances according to Table 8	(see appended table)	N
- (16.3)	Clearances		P
- (16.3.2)	Clearances for working voltages		P
	Clearances distances according to Table 9	(see appended table)	P
- (16.3.3)	Clearances for ignition voltages and working voltages with higher frequencies		N



IEC 61347-2-13			
Clause	Requirement - Test	Result - Remark	Verdict
	Clearances distances for basic or supplementary insulation according to Table 10	(see appended table)	N
	Clearances distances for reinforced insulation according to Table 11	(see appended table)	N
<b>18 (17)</b>	<b>SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS</b>		—
	Screws, current-carrying parts and connections in compliance with IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1)		—
(4.11)	Electrical connections		P
(4.11.1)	Contact pressure		P
(4.11.2)	Screws:		—
	- self-tapping screws		P
	- thread-cutting screws		N
	- at least two self-tapping screws		N
(4.11.3)	Screw locking:		—
	- spring washer		P
	- rivets		P
(4.11.4)	Material of current-carrying parts		N
(4.11.5)	No contact to wood		P
(4.11.6)	Electro-mechanical contact systems		N
(4.12)	Mechanical connections and glands		N
(4.12.1)	Mechanical stress		P
	Screws not made of soft metal		P
	Screws of insulating material		N
	Torque test: part; torque (Nm) .....	Fixing metal enclosure: 2.76mm; 0.4Nm	P
	Torque test: part; torque (Nm) .....		N
(4.12.2)	Screw diameter < 3mm screwed into metal		N
(4.12.4)	Locked connections		N
	- fixed arms; torque (Nm) .....		N
	- lampholder; torque (Nm) .....		N
	- push-button switches; torque 0,8 Nm .....		N
(4.12.5)	Screwed glands; force (Nm) .....		N

IEC 61347-2-13			
Clause	Requirement - Test	Result - Remark	Verdict

<b>19 (18)</b>	<b>RESISTANCE TO HEAT, FIRE AND TRACKING</b>		—
(18.1)	Parts of insulating material retaining live parts in position, ball-pressure test:		—
	- part; test temperature (°C) .....	Transformer bobbin: 125 °C, 0.65mm	P
	- part; test temperature (°C) .....	PCB: 125 °C, 0.71mm	P
	- part; test temperature (°C) .....		P
(18.2)	Printed boards in accordance with IEC 60249-1, 4.3		P
	- part; test .....	PCB	P
(18.3)	External parts of insulating material preventing electric shock glow-wire test 650°C		P
	- part; test .....	Transformer bobbin	P
	- part; test .....	PCB	P
(18.4)	Parts of insulating material retaining live parts in position, needle-flame test 10 s:		—
	- part; test .....	Transformer bobbin	P
	- part; test .....	PCB	P
(18.5)	Tracking test		N
	- part; test .....		N

<b>20 (19)</b>	<b>RESISTANCE TO CORROSION</b>		—
	Rust protection:		N
	- 10% solution of ammonium chloride in water		N
	- adequate varnish on the outer surface		N

<b>21 (-)</b>	<b>MAXIMUM WORKING VOLTAGE (UOUT) IN ANY LOAD CONDITION</b>		—
	Not exceed declared maximum working voltage Uout in any load condition		P

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Clause	Requirement - Test	Result - Remark	Verdict
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14	TABLE: TESTS OF FAULT CONDITIONS				P
Part	Un	Short-circuited	Dis-connected	Remark	Hazard
RV1	240	X	--	Fuse opened immediately	No
BD1	240	X	--	Fuse opened immediately	No
CX1	240	X	--	Fuse opened immediately	No
T2(1-4)	240	X	--	Unit shutdown, can be recoverable.	No
T2(2-5)	240	X	--	Unit shutdown, can be recoverable.	No
Q1(D-G)	240	X	--	Fuse opened immediately	
Q1(D-S)	240	X	--	Fuse opened immediately	
Q1(G-S)	240	X	--	Fuse opened immediately	
C9	240	X	--	Fuse opened immediately	No
CY1	240	X	--	Unit shutdown, can be recoverable.	No
Output	240	X	--	Unit shutdown, can be recoverable.	No
Supplementary information:					
Following test items were recorded worst case only.					



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Clause	Requirement - Test	Result - Remark	Verdict

14	TABLE: TESTS OF FAULT CONDITIONS						P
Table 3	Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages						P
RMS working voltage (V) not exceeding	50	150	250	500	750	1000	
Creepage distances							
Required basic insulation, PTI $\geq 600$	0,6	0,8	1,5	3	4	5,5	
Measured	--	--	--	--	--	--	
Required basic insulation, PTI $< 600$	1,2	1,6	2,5	5	8	10	
Live parts of different polarity(L/N)	--	--	>3.0	--	--	--	
Required basic insulation, PTI $< 600$	1,2	1,6	2,5	5	8	10	
Two pins of fuse on PCB	--	--	>3.0	--	--	--	
Required supplementary insulation PTI $\geq 600$	--	0,8	1,5	3	4	5,5	
Measured	--	--	--	--	--	--	
Required supplementary insulation PTI $< 600$	--	1,6	2,5	5	8	10	
Measured	--	--	--	--	--	--	
Required reinforced insulation	--	3,2	5	6	8	11	
Measured	--	--	>5.0	--	--	--	
Clearances (See attachment 6)							
Required basic insulation	0,2	0,8	1,5	3	4	5,5	
Live parts of different polarity(L/N)	--	--	>2.4	--	--	--	
Required basic insulation	0,2	0,8	1,5	3	4	5,5	
Two pins of fuse on PCB	--	--	>2.4	--	--	--	
Required supplementary insulation	-	0,8	1,5	3	4	5,5	
Measured	--	--	--	--	--	--	
Required reinforced insulation	-	1,6	3	6	8	11	
Measured	--	--	--	--	--	--	
Table 4	Minimum distances (mm) for non-sinusoidal pulse voltages						
Rated pulse voltage (peak kV)	2,0	2,5	3,0	4,0	5,0	6,0	8,0
Required clearances	1,0	1,5	2	3	4	5,5	8
Measured	--	--	--	--	--	--	--
Rated pulse voltage (peak kV)	10	12	15	20	25	30	40
Required clearances	11	14	18	25	33	40	60
Measured	--	--	--	--	--	--	--

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Clause	Requirement - Test	Result - Remark	Verdict
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14	TABLE: TESTS OF FAULT CONDITIONS						P
Rated pulse voltage (peak kV)	50	60	80	100	-	-	-
Required clearances	75	90	130	170	-	-	-
Measured	--	--	--	--	--	--	--

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Clause	Requirement - Test	Result - Remark	Verdict

<b>A</b>	<b>ANNEX A (NORMATIVE), TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK</b>		—
(A.1)	Comply with A.2 or A.3		P
(A.2)	Voltage $\leq 35$ V peak or $\leq 60$ V d.c		P
(A.3)	If voltage measured according Clause A.2 exceeds the limit value; touch current does not exceed 0,7 mA (peak) or 2 mA d.c		N
	Comply with Annex G.2 of IEC 60598-1		N

<b>C</b>	<b>ANNEX C – PARTICULAR REQUIREMENTS FOR ELECTRONIC LAMP CONTROLGEAR WITH MEANS OF PROTECTION AGAINST OVERHEATING</b>		—
<b>C3</b>	<b>GENERAL REQUIREMENTS</b>		<b>N</b>
C3.1	Thermal protection means integral with the controlgear, protected against mechanical damage		N
	Renewable only by means of a tool		N
	If function depending on polarity, for cordconnected equipment protection means in both leads		N
	Thermal links comply with IEC 60691		N
	Electrical controls comply with IEC 60730-2-3		N
C3.2	No risk of fire by breaking (clause C7)		N
<b>C5</b>	<b>CLASSIFICATION</b>		—
	a) automatic resetting type		—
	b) manual resetting type		—
	c) non-renewable, non-resetting type		—
	d) renewable, non-resetting type		—
	e) other type of thermal protection; description		N
<b>C6</b>	<b>MARKING</b>		—
C6.1	Symbol for temperature declared thermally protected ballasts		N
C6.2	Declaration of the type of protection provided		N
<b>C7</b>	<b>LIMITATION OF HEATING</b>		—
C7.1	Preselection test		N
	Test sample placed for at least 12 h in an oven having temperature ( $t_c - 5$ ) K		N

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Clause	Requirement - Test	Result - Remark	Verdict
	No operation of the protection device		N
C7.2	Functioning of protection means		N
	Normal operation of the sample in a test enclosure according to Annex D at an ambient temperature such that (tc +0; -5) °C is obtained		N
	No operation of the protection device		N
	Introducing of the most onerous test condition determined during test of clause 14		N
	Output of windings connected to the mains supply short-circuited, and other part of the controlgear operated under normal conditions		N
	Increasing of the current through the windings continuously until operation of the protection means		N
	Continuous measuring of the highest surface temperature		N
	Controlgear according to C5 a) or C5 e) operated until stable conditions are achieved		N
	Automatic-resetting thermal protectors working 3 times		N
	Controlgear according to C5 b) working 6 times		N
	Controlgear according to C5 c) and C5) d) working once		N
	Highest temperature does not exceed the marked value		N
	Any overshoot of 10% over the marked value within 15 min		N

<b>D</b>	<b>ANNEX D – REQUIREMENTS FOR CARRY OUT THE HEATING TESTS OF THERMALLY PROTECTED LAMP CONTROLGEAR</b>		<b>N</b>
	Tests in C7 performed in accordance with Annex D, if applicable		N
<b>F</b>	<b>ANNEX F – DRAUGHT-PROOF ENCLOSURE</b>		<b>N</b>
	Draught-proof enclosure in accordance with the description		P
	Dimensions of the enclosure		P
	Other design; description		N

<b>H</b>	<b>ANNEX H – TESTS</b>		<b>P</b>
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Clause	Requirement - Test	Result - Remark	Verdict
	All tests performed in accordance with the advise given in Annex H, if applicable		P

I (L)	ANNEX I: PARTICULAR ADDITIONAL REQUIREMENTS FOR SELV D.C. OR A.C. SUPPLIED ELECTRONIC CONTROLGEAR FOR LED MODULES		P
(L.3)	Classification		—
	Class I	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Class II	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Class III	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	non-inherently short circuit proof controlgear	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	inherently short circuit proof controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	fail safe controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	non-short-circuit proof controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
(L.4)	Marking		P
	Adequate symbols are used		P
(L.5)	Protection against electric shock		P
	Comply with 9.2 of IEC 61558-1		P
(L.6)	Heating		P
	No excessive temperatures in normal use		P
	Value if capacitor $t_c$ marked .....		P
	Winding insulation classified as Class.....	Class B	P
	Comply with tests of clause 14 of IEC 61558-1 with adjustments		P
(L.7)	Short-circuit and overload protection		P
	Comply with tests of clause 15 of IEC 61558-1 with adjustments		P
(L.8)	Insulation resistance and electric strength	25°C; 93%R.H.	P
(L.8.1)	Conditioned 48 h between 91 % and 95 %		P
(L.8.2)	Insulation resistance		P
	Between input- and output circuits not less than 5 MΩ .....	100MΩ	P
	Between metal parts of class II convertors which are separated from live parts by basic insulation only and the body not less than 5 M .....		N

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Clause	Requirement - Test	Result - Remark	Verdict
	Between metal foil in contact with the inner and outer surfaces of enclosures of insulating material not less than 2 MΩ .....		N
(L.8.3)	Electric strength test:		P
	1) Between live parts of input circuits and live parts of output circuits .....	2960V	P
	2) Over basic or supplementary insulation between:		P
	a) live parts which are or may become of different polarity .....	1480V	P
	b) live parts and body if intended to be connected to protective earth.....		N
	c) accessible metal parts and a metal rod of the same diameter as the flexible cable or cord .....		N
	d) live parts and an intermediate metal part.....		N
	e) intermediate metal parts and the body .....		N
	f) each input circuit and all other input circuits .....		N
	3) Over reinforced insulation between the body and live parts		N
(L.9)	Construction		P
(L.9.1)	Transformer comply with 19.12 of IEC 61558-1 and 19 of IEC 61558-2-6		P
	HF transformer comply with 19 of IEC 61558-2-16		P
(L.10)	Components		P
	Protective devices comply with 20.6 – 20.11 of IEC 61558-1		P
(L.11)	Creepage distances, clearances and distances through insulation		P
	Creepage distances and clearances not less than in Clause 16		N
	Distance through insulation according Table L.5 in IEC 61347-1		N
	1) Basic distance through insulation		P
	Required distance (mm) .....		N
	Measured (mm) .....		N
	Supplementary information		N
	2) Supplementary distance through insulation		N
	Required distance (mm) .....		N

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Clause	Requirement - Test	Result - Remark	Verdict
	Measured (mm) .....		N
	Supplementary information		N
	3) Reinforced distance through insulation		P
	Required distance (mm) .....		P
	Measured (mm) .....		P
	Supplementary information		P

<b>J (-)</b>	<b>ANNEX J IN THIS PART 2 – PARTICULAR ADDITIONAL SAFETY REQUIREMENTS FOR A.C., A.C./D.C. OR D.C. SUPPLIED ELECTRONIC CONTROLGEAR FOR EMERGENCY LIGHTING</b>		--
<b>J.1</b>	<b>General</b>		<b>N</b>
	Intended for centralized emergency power supply	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
<b>J.2</b>	<b>Marking</b>		<b>N</b>
J.2.1	Mandatory markings		N
	a) symbol EL		N
	b) rated emergency supply voltage (V)		N
J.2.2	Information to be provided if applicable		N
	a) Limits of ambient temperature		N
	b) Emergency output factor (EOF <sub>x</sub> )		N
	c) Information if intended for use in luminaires for high-risk task area lighting		N
J.3	General notes on tests		N
	Length of output cable in tests.....		N
	Load instead of LED lamps/modules.....		N
J.4	Starting conditions		N
	Start rated load in emergency mode without adversely affecting the performance		N
J.5	Operating condition		N
	Comply with the requirements of 7.2 of IEC 62384 at 90% and 110% of rated emergency supply voltage		N
J.6	Emergency supply current		N
	Emergency supply current not differ more than ±15 %		N
	Supply of low impedance and low inductance		N

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Clause	Requirement - Test	Result - Remark	Verdict
J.7	EMC immunity		N
	Comply with the requirements of IEC 61547		N
J.8	Pulse voltage from central battery systems		N
	Withstand pulses according Table J.1		N
J.9	Tests for abnormal conditions		N
	Comply with the requirements of 12 of IEC 62384		N
J.10	Comply with the requirements of 13 of IEC 62384		N
J.11	Functional safety (EOF <sub>x</sub> )		N
	Declared emergency output factor (EOF <sub>x</sub> ) achieved during emergency operation		N

<b>N</b>	<b>ANNEX N: REQUIREMENTS FOR INSULATION MATERIALS USED FOR DOUBLE OR REINFORCED INSULATION</b>		<b>---</b>
<b>N.4</b>	<b>General requirements</b>		<b>P</b>
N.4.1	Material comply with IEC 60085 and IEC 60216 series		P
N.4.2	Solid insulation		P
	Electric strength test at least 5 kV or 1,35 x test voltage in Table N.1		N
	If not classified according IEC 60085 and IEC 60216 series: Electric strength test increased 10 % of 5,5 kV or 1,5 x test voltage in Table N.1		N
N.4.3	Thin sheet insulation		P
N.4.3.1	Thickness and composition of thin sheet insulation		P
	- Inside the ballast and not subjected to handling or abrasion during the production and during maintenance		P
	- Non-separated layers: Min. 3 layers and fulfil mandrel test of 150N		P
	- Separated layers: Min. 2 layers and each layer fulfil mandrel test of 50N		N
	- Separated layers (alternative): Min. 3 layers and 2/3 of the layers fulfil mandrel test of 100N		N
N.4.3.2	Mandrel test (electric strength test during mechanical stress)		P
	Electric strength test after mandrel test:		P

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Clause	Requirement - Test	Result - Remark	Verdict
	- Non-separated layers: min. 5 kV or 1,35 x test voltage in Table N.1	5kV	P
	- 2/3 of min. 3 separated layers: min. 5 kV or 1,25 x test voltage in Table N.1		N
	- one of 2 separated layers: min. 5 kV or 1,25 x test voltage in Table N.1		N
	No flashover or breakdown occurred		N

<b>O</b>	<b>ANNEX O: ADDITIONAL REQUIREMENTS FOR BUILT-IN ELECTRONIC CONTROLGEAR WITH DOUBLE OR REINFORCED INSULATION</b>		---
<b>O.6</b>	<b>Marking</b>		---
	Marking according clause 7 (7)	See clause 7	P
	Special symbol		N
	Meaning of the special symbol explained in catalogue		N
<b>O.7</b>	<b>Protection against accidental contact with live parts</b>		---
	Requirements of clause 8 (10)	See clause 8	P
	Test finger not possible to make contact with basic insulated metal parts		N
<b>O.8</b>	<b>Terminals</b>		---
	Clause 9 (8)	See clause 9	N
<b>O.9</b>	<b>Provision for earthing</b>		---
	Functional earthing terminals comply with clause 9 of part 1		P
	No protective earthing terminal		N
<b>O.10</b>	<b>Moisture resistance and insulation</b>		---
	Clause 11 (11)	See clause 11	P
<b>O.11</b>	<b>Electric strength</b>		---
	Clause 12 (12)	See clause 12	P
<b>O.13</b>	<b>Fault conditions</b>		---
	Clause 14 (14)	See clause 14	P
	End of test, between live part and accessible metal parts or external parts of insulating material in contact with the supporting surface comply with dielectric strength test reduced to 35 % of values according Table 1 in part 1		N



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Clause	Requirement - Test	Result - Remark	Verdict
	Insulation resistance according to O.10 between live part and accessible metal parts or external parts of insulating material in contact with the supporting surface not less than 4 MΩ		N
<b>O.14</b>	<b>Construction</b>		---
	Clause 17 (15)	See clause 17	P
	Accessible metal parts insulated from live parts by double or reinforced insulation		P
	Live part insulated from supporting surface in contact with external faces by double or reinforced insulation		N
<b>O.15</b>	<b>Creepage distances and clearances</b>		---
	Clause 18 (16)	See clause 18	P
	Comply with corresponding values for luminaries in IEC 60598-1		N
<b>O.16</b>	<b>Screws, current-carrying parts and connections</b>		---
	Clause 19 (17)	See clause 19	P
<b>O.17</b>	<b>Resistance to heat and fire</b>		---
	Clause 20 (18)	See clause 20	P
<b>O.18</b>	<b>Resistance to corrosion</b>		---
	Clause 21 (19)	See clause 21	N

<b>(P)</b>	<b>Creepage distances and clearances and distance through isolation (DTI) for lamp controlgear which are protected against pollution by the use of coating or potting</b>		---
<b>(P.1)</b>	<b>General</b>		<b>N</b>
	P.2 applies if creepage distances less than the minimum in Table 7 and 8		N
	P.3 applies if clearance less than the minimum in Table 9, 10 and 11		N
<b>(P.2)</b>	<b>Creepage distances</b>		<b>N</b>
<b>(P.2.2)</b>	Minimum creepage distances for working voltages and rated voltages with frequencies up to 30 kHz (Table P.1)		N
	Basic or supplementary insulation:		N
	Required creepage .....		—
	Measured.....		N
	Supplementary information		—

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Clause	Requirement - Test		Verdict
	Reinforced insulation:		N
	Required creepage .....		—
	Measured .....		N
	Supplementary information		—
(P.2.3)	Creepage distances for working voltages with frequencies above 30 kHz (Table P.2)		N
	Voltage $\hat{U}_{out}$ kV .....		—
	Frequency .....		—
	Required distance .....		—
	Measured .....		N
	Supplementary information		—
(P.2.4)	Compliance with the required creepage distances		N
(P.2.4.1)	Compliance in accordance with 16.3.3 and test according P.2.4.2		N
(P.2.4.3)	Electrical tests after conditioning		N
(P.2.4.3.1)	Insulation resistance and electric strength according Clause 11 and 12		N
<b>(P.3)</b>	<b>Distance through isolation</b>		<b>N</b>
(P.3.4)	Electrical tests after conditioning		N
(P.3.4.1)	Insulation resistance and electric strength according Clause 11 and 12		N
(P.3.4.2)	Impulse voltage dielectrical test		N
	Basic or supplementary insulation:		N
	Working/rated voltage .....		—
	Impulse voltage .....		N
	Supplementary information		—
	Reinforced insulation:		N
	Working/rated voltage .....		—
	Impulse voltage .....		N
	Supplementary information		—

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Clause	Requirement - Test		Result - Remark	Verdict
<b>L.6</b>	<b>TABLE: Heating - normal operation</b>			<b>P</b>
	Type reference	MDV360HH12		—
	Lamp used	LED driver		—
	Mounting position	As normal use		—
	Test voltage (V)	1 test: 200*1.06=212V 2 test: 240*1.06=254.4V		—
Temperature rise(K) of part		1 Test (°C)	2 Test (°C)	Limit (°C)
Supply cord		58.6	59.2	105
C1(X capacitor)		64.7	69.6	110
RV1		68.2	71.5	85
BD1		81.6	83.5	130
T1 core		86.4	87.6	130
T1 bobbin		85.3	88.1	130
T1 winding		90.6	88.3	130
PCB near T1		78.6	79.5	130
C11		76.4	80.1	105
T2 core		91.5	90.4	130
T2 bobbin		88.4	89.7	130
T2 winding		93.4	92.5	130
CY1		76.3	77.8	125
EC5		81.7	82.6	105
Tc		72.6	71.8	80
Support surface		68.9	70.4	90
Ambient		40	40	Ref.



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Clause	Requirement - Test	Result - Remark	Verdict
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<b>L.7</b>	<b>TABLE: Heating – abnormal condition(short-circuit and over-loads)</b>		<b>N</b>
	Type reference		---
	Lamp used		---
	Mounting position		---
	Test voltage (V) .....		---
Temperature (°C) of part		Test (°C) (Max. Value recorded)	limit (°C)
<p>Remark: 1.Output shut down immediately after abnormal conditions for 1h, the temperature rise of components are lower than temperature rise of components at normal heating test, so no temperature rise are recorded.</p> <p>2.Overload test: test data was recorded as above form.</p>			

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Clause	Requirement - Test	Result - Remark	Verdict

ANNEX 1: components					P
Object/part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity
PCB	SHENZHEN YAHENG CIRCUIT TECHNOLOGY CO LTD	YH-D or YH-M	V-0; 130°C	--	UL E501849
	FOSHAN GAOMING HAOWANG CIRCUIT BOARD CO LTD	HW-D or HW-M	V-0; 130°C	--	UL E469528
	SHENZHEN FAST ELECTRONIC TECHNOLOGY CO LTD	KJ-ML or KJ-DS	V-0; 130°C	--	UL E366050
Input wire	Ningbo Dabu Electric Appliance Co., Ltd	H05RN-F H05RR-F H07RN-F	3*1.0 mm <sup>2</sup> Min	--	VDE 40030691
	Jintan Wanda Cord & Cable Co., Ltd	H05RN-F H07RN-F	3*1.0mm <sup>2</sup> Min	--	VDE 40017713
Output wire	Ningbo Dabu Electric Appliance Co., Ltd	H05RR-F H07RN-F	2*2.08 mm <sup>2</sup> Min	--	VDE 40030691
	Jintan Wanda Cord & Cable Co., Ltd	H07RN-F	2*2.08mm <sup>2</sup> Min	--	VDE 40017713
Fuse	Littelfuse, Inc.	392	5A, AC 250 V	EN 60127-1; EN 60127-3 EN 60384-14 EN 60384-14	VDE 126983
Alt.	Dongguan Reomax Electronics Technology Co., Ltd.	MTS	5A, AC 250 V	EN 60127-1; EN 60127-3 EN 60384-14 EN 60384-14	VDE 40039420
Alt.	Dongguan Reomax Electronics Technology Co., Ltd.	TBP	5A, AC 250 V	EN 60127-1; EN 60127-3 EN 60384-14 EN 60384-14	VDE 40032053
Alt.	Conquer Electronics Co., Ltd.	PDU	5A, AC 250 V	EN 60127-1; EN 60127-3 EN 60384-14 EN 60384-14	VDE 40006776
Alt.	Walter Electronic Co. Ltd.	ICP-Series	5A, AC 250 V	EN 60127-1; EN 60127-3 EN 60384-14 EN 60384-14	VDE 40012824

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IEC 61347-2-13					
Clause	Requirement - Test			Result - Remark	Verdict
	ANNEX 1: components				P
Object/part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity
X-capacitor (C1; C2; C3) (C1:0,1μF; C2:0,47μF; C3: 0,22μF)	Tenta Electrhc Industrial Co. Ltd.	MEX	X2; AC 275V; 100°C	EN 60384-14	VDE 119119
	Shenzhen Su Rong Capacitors Co., Ltd.	MPX/MKP	X2; AC280V; 100°C	EN 60384-14	VDE 40008924
	Dongguan City JURCC ELECTRONICS CO. LTD	MPX/MKP	X2; AC 275V; 110°C	EN 60384-14	VDE 40034920
	Dain Electronics Co., Ltd.	MPX	X2; AC 275V; 100°C	EN 60384-14	VDE 40018798
Y-capacitor (CY1; CY2; CY6; CY7)	Jyh Chung	JD	Y1; 1000pF; AC400V; 125°C	EN 60384-14	VDE 137027
	DongGuan City Jiankun Electronics Technology	JT	Y1; 1000pF; AC400V; 125°C	EN 60384-14	VDE 40041534
	DONG GUAN AJC INDUSTRIAL CO., LTD	JT series	Y1; 1000pF; AC400V; 125°C	EN 60384-14	VDE 40043090
Y-capacitor (CY3; CY4; CY5)	Jyh Chung	JD	Y1; 2200pF; AC400V; 125°C	EN 60384-14	VDE 137027
	DongGuan City Jiankun Electronics Technology	JT	Y1; 2200pF; AC400V; 125°C	EN 60384-14	VDE 40041534
	DONG GUAN AJC INDUSTRIAL CO., LTD	JT series	Y1; 2200pF; AC400V; 125°C	EN 60384-14	VDE 40043090
Transformer (T2)	ZHUHAI RUNGU ELE CTRONICS CO.,LTD. /Zhuhai Fuyuan Electronic Co., Ltd	MTV360HH 12	Class 130(B)	EN 61347-1 EN 61347-2-13	Tested with appliance
-Bobbin	SUMITOMO BAKELITE CO LTD	PM-9820	V-0; 150°C	--	UL E41429
-WIRE	TA YA ELECTRIC WIRE & CABLE CO LTD	QA-B	130°C	--	UL E84201
-Triple insulated wire	Shenzhen Darun Science and Technology Co., Ltd	DRTIW-B	130°C	--	VDE 40032470
-Tape	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD	CT*(b)(g)	130°C	--	UL E165111



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Clause	Requirement - Test	Result - Remark	Verdict

ANNEX 1: components					P
Object/part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity
-Tube	GREAT HOLDING INDUSTRIAL CO LTD	TFL	150V, 200°C	--	UL E156256
Potting material	SHENZHEN OPUITE INDUSTRY MATERIALS CO., LTD	916	BK V-0; 150°C	--	UL E335127
	SHENZHEN SHI HUATIANQI TECHNOLOGY CO LTD	CS-9812	V-0;105°C	--	UL E341692
	SHEN ZHEN BAO LI INTENATION CO LTD	BN	V-0;105°C	--	UL E254560

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IEC 61347-2-13			
Clause	Requirement - Test	Result - Remark	Verdict

L11	TABLE: creepage distances and clearances See table 3							N
creepage distance Cr. and clearance distance Cl. at/of:	Up (V)	U rms. (V)	Table L.5	Measured		Required in table L.5		
				Cl. (mm)	Cr. (mm)	Cl. (mm)	Cr. (mm)	
Basic Insulation								
--	--	--	--	--	--	--	--	
Supplementary Insulation								
--	--	--	--	--	-	--	-	
Reinforced or Double Insulation								
--	--	--	--	--	--	--	--	
DTI (Distance through insulation)								
creepage distance Cr. and clearance distance Cl. at/of:	Up (V)	U rms. (V)	Table L.5	Measured		Required in table L.5 DTI (mm)		
				DTI (mm)	Layers of insulation tape			
Basic Insulation								
--	--	--	--	--	--	--		
Supplementary Insulation								
--	--	--	--	--	--	--		
Reinforced or Double Insulation								
--	--	--	--	--	--	--		
Remark: 1. above limits are considered under normal pollution and PTI < 600 condition. 2. minimum measured value recorded.								

IEC 61347-2-13			
Clause	Requirement - Test	Result - Remark	Verdict

	<b>ANNEX 2: screw terminals (part of the luminaire)</b>		N
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<b>(14)</b>	<b>SCREW TERMINALS</b>		N
(14.2)	Type of terminal.....:		—
	Rated current (A).....:		—
(14.3.2.1)	One or more conductors		N
(14.3.2.2)	Special preparation		N
(14.3.2.3)	Terminal size		N
	Cross-sectional area (mm <sup>2</sup> ).....:		N
(14.3.3)	Conductor space (mm).....:		N
(14.4)	Mechanical tests		N
(14.4.1)	Minimum distance		N
(14.4.2)	Cannot slip out		N
(14.4.3)	Special preparation		N
(14.4.4)	Nominal diameter of thread (metric ISO thread) ..:		N
	External wiring		N
	No soft metal		N
(14.4.5)	Corrosion		N
(14.4.6)	Nominal diameter of thread (mm) .....		N
	Torque (Nm) .....		N
(14.4.7)	Between metal surfaces		N
	Lug terminal		N
	Mantle terminal		N
	Pull test; pull (N) .....		N
(14.4.8)	Without undue damage		N



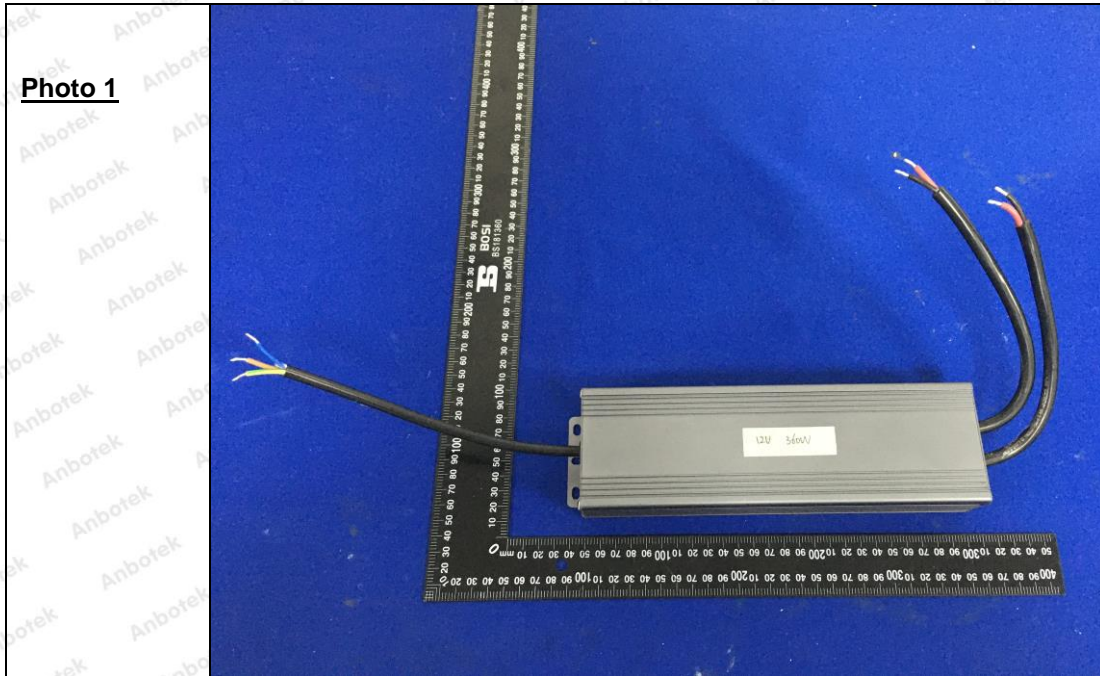
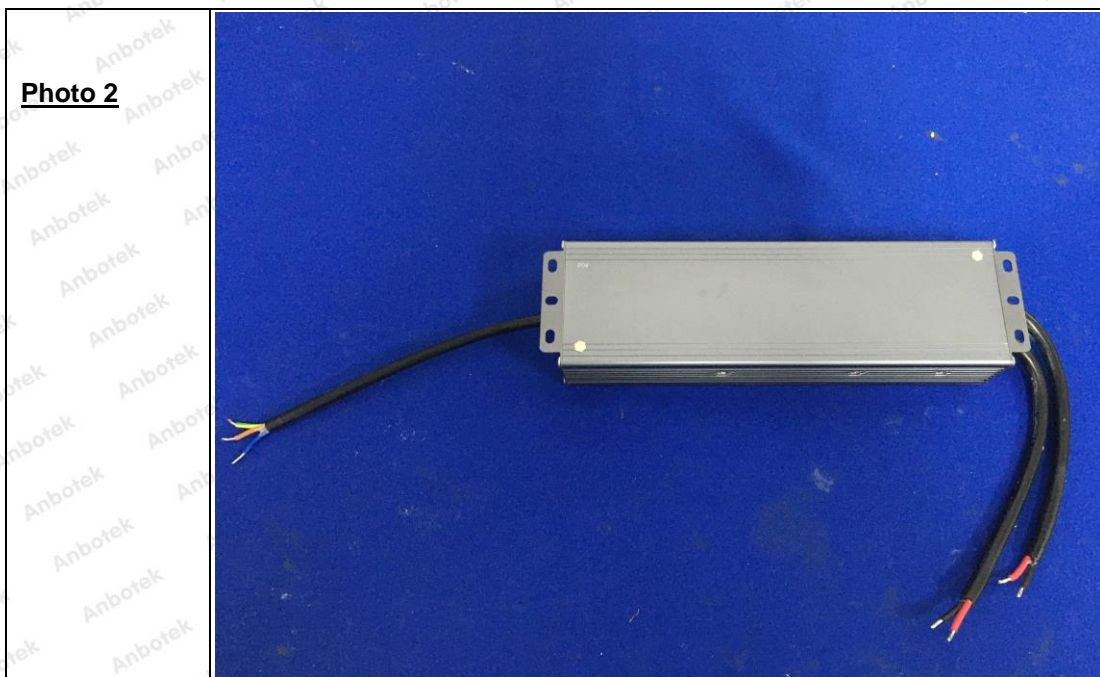
IEC 61347-2-13			
Clause	Requirement - Test	Result - Remark	Verdict

	<b>ANNEX 3: screwless terminals (part of the luminaire)</b>		N
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<b>(15)</b>	<b>SCREWLESS TERMINALS</b>		N
(15.2)	Type of terminal .....		—
	Rated current (A) .....		—
(15.3.1)	Material		N
(15.3.2)	Clamping		N
(15.3.3)	Stop		N
(15.3.4)	Unprepared conductors		N
(15.3.5)	Pressure on insulating material		N
(15.3.6)	Clear connection method		N
(15.3.7)	Clamping independently		N
(15.3.8)	Fixed in position		N
(15.3.10)	Conductor size		N
	Type of conductor		N
(15.5)	Terminals and connections for internal wiring		N
(15.5.1)	Mechanical tests		N
(15.5.1.1.1)	Pull test spring-type terminals (4 N, 4 samples) .....		N
(15.5.1.1.2)	Pull test pin or tab terminals (4 N, 4 samples) .....		N
	Insertion force not exceeding 50 N		N
(15.5.1.2)	Permanent connections: pull-off test (20 N)		N
(15.5.2)	Electrical tests		N
	Voltage drop (mV) after 1 h (4 samples) .....		N
	Voltage drop of two inseparable joints		N
	Number of cycles.....		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples).....		N
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples).....		N
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples).....		N

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Clause	Requirement - Test						Result - Remark				Verdict
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples).....										N
(15.6)	Terminals and connections for external wiring										N
(15.6.1)	Conductors										
	Terminal size and rating										N
15.6.2	Mechanical tests										N
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....										N
(15.6.2.2)	Pull test pin or tab terminals (4 samples); pull (N) .....										N
(15.6.3)	Electrical tests										N
	Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1										N
	Voltage drop (mV) after 1 h										N
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Voltage drop of two inseparable joints										N
	Voltage drop after 10th alt. 25th cycle										N
	Max. allowed voltage drop (mV) .....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Voltage drop after 50th alt. 100th cycle										N
	Max. allowed voltage drop (mV) .....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Continued ageing: voltage drop after 10th alt. 25th cycle										N
	Max. allowed voltage drop (mV) .....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Continued ageing: voltage drop after 50th alt. 100th cycle										N
	Max. allowed voltage drop (mV) .....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											



**Attachment : Photo documentation****Photo 1****Photo 2****--End of report--**