APPLICATION FOR LOW VOLTAGE DIRECTIVE

On Behalf of

V-TAC EXPORTS LIMITED

LED LINEAR LIGHT - TRUNKING

Model: VT-4549D, VT-4550D, VT-4551D

Prepared For :

V-TAC EXPORTS LIMITED
ROOM NO.301, KANM ON BUILDING 176A QUEENS ROAD CENTRAL, CENTRAL.HONGKONG

Prepared By :

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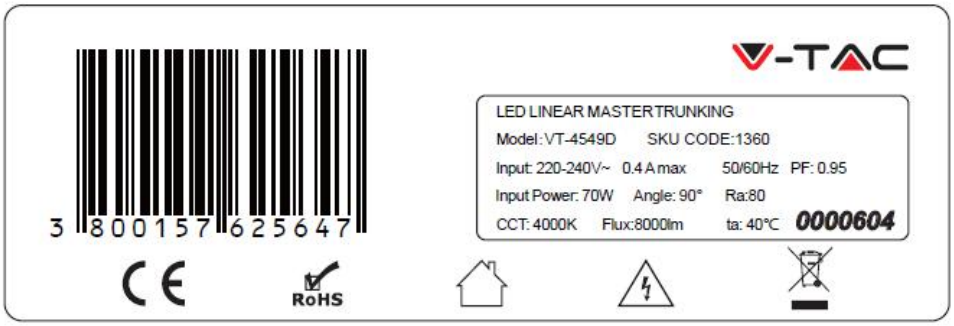
TEST REPORT
EN 60598-2-1
Luminaires
Part 2: Particular requirements
Section 1: Fixed general purpose luminaires

Tested by (Engineer)..... :	Tony Leung
Approved by (Manager)..... :	Lemon Rao
Date of issue..... :	Aug. 17, 2017
Contents..... :	64 pages
Testing laboratory.....:	
Name..... :	TMC Testing Services(Shenzhen) Co., Ltd.
Address..... :	5/F,Block E,Guanghao Industrial Park, Dalang, Street, Longhua District, Shenzhen, Guangdong, P.R. China
Testing location..... :	Same as above
Applicant's name.....:	V-TAC EXPORTS LIMITED
Address.....:	ROOM NO.301, KANM ON BUILDING 176A QUEENS ROAD CENTRAL, CENTRAL.HONGKONG
Test specification:	
Standard..... :	EN 60598-2-1: 1989 used in conjunction with EN 60598-1: 2015. EN 61347-2-13: 2014 used in conjunction with EN 61347-1: 2015.
Test procedure.....:	LVD
Non-standard test method.....:	N/A
Test item description.....:	LED LINEAR LIGHT - TRUNKING
Trade Mark.....:	V-TAC
Manufacturer.....:	V-TAC EXPORTS LIMITED
Address..... :	ROOM NO.301, KANM ON BUILDING 176A QUEENS ROAD CENTRAL, CENTRAL.HONGKONG
Model/Type reference.....:	See model list.
Ratings.....:	See model list.

Copy of marking plate:

LED LINEAR LIGHT - TRUNKING:



LED DRIVER:

Classification of installation and use.....:	Class I
Supply Connection.....:	Terminals
Possible test case verdicts:	
- test case does not apply to the test object.....:	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.....:	Aug. 04, 2017
Date (s) of performance of tests.....:	Aug. 04, 2017- Aug. 15, 2017

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.

General product information:

1.All tests compliance with the standards o EN 60598-2-1:1989 (also see EN 60598-1: 2015).
2.Note: All the tests were performed on model VT-4550D.
3.Model list of LED LINEAR LIGHT - TRUNKING:

Model	Input voltage/frequency/current	Power	Dimming	Size	LED Model	Color Temperature	LED DRIVER
VT-4549D	220~240V/50~60HZ/ 0.4A max	70W	1-10V	1.5M	2835	2700K/3000K/3500K/4000K/5000K/ 6000K	4549D
VT-4550D	220~240V/50~60HZ/ 0.3A max	50W	1-10V	1.5M	2835	2700K/3000K/3500K/4000K/5000K/ 6000K	4551D/VT-4550D
VT-4551D	220~240V/50~60HZ/ 0.3A max	50W	1-10V	1.5M	2835	2700K/3000K/3500K/4000K/5000K/ 6000K	4551D/VT-4550D

4.Model list of LED DRIVER:

Model	Input voltage/frequency/current	Output voltage/current	Output Power	Dimming
4551D/VT-4550D	220~240V/50~60HZ/0.33A max	55~80V/0.62A	50W max	1~10V
4549D	220~240V/50~60HZ/0.47A max	55~70V/1A	70W max	1~10V

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Clause	Requirement + Test	Result - Remark	Verdict
2 (0)	**GENERAL TEST REQUIREMENTS**		P
1.2 (0.1)	Information for luminaire design considered.....:	Standard Yes ☒ No ☐	—
1.2 (0.3)	More sections applicable.....:	Yes ☐ No ☒	—
1.4 (2)	**CLASSIFICATION**		P
1.4 (2.2)	Type of protection .....:	Class I	—
1.4 (2.3)	Degree of protection.....:	IP20	—
1.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces.....:	Yes ☒ No ☐	—
1.4 (2.5)	Luminaire for normal use .....:	Yes ☒ No ☐	—
	Luminaire for rough service .....:	Yes ☐ No ☒	—
1.5 (3)	**MARKING**		P
1.5 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
1.5 (3.3)	Additional information		P
	Language of instructions	English	P
1.5 (3.3.1)	Combination luminaires		N
1.5 (3.3.2)	Nominal frequency in Hz	50/60Hz	P
1.5 (3.3.3)	Operating temperature	Ta: 40℃	P
1.5 (3.3.4)	Symbol or warning notice		N
1.5 (3.3.5)	Wiring diagram		P
1.5 (3.3.6)	Special conditions		N
1.5 (3.3.7)	Metal halide lamp luminaire – warning		N
1.5 (3.3.8)	Limitation for semi-luminaires		N
1.5 (3.3.9)	Power factor and supply current		N
1.5 (3.3.10)	Suitability for use indoors		P
1.5 (3.3.11)	Luminaires with remote control		N
1.5 (3.3.12)	Clip-mounted luminaire – warning		N
1.5 (3.3.13)	Specifications of protective shields		N
1.5 (3.3.14)	Symbol for nature of supply	~	P

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Clause	Requirement + Test	Result - Remark	Verdict
1.5 (3.3.15)	Rated current of socket outlet		N
1.5 (3.3.16)	Rough service luminaire		N
1.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments		N
1.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N
1.5 (3.3.19)	Protective conductor current in instruction if applicable		N
1.5 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N
1.5 (3.3.21)	Non-replaceable and non-user replaceable light sources information provided		N
	Cautionary symbol		N
1.5 (3.3.22)	Controllable luminaires, classification of insulation provided		N
1.5 (3.4)	Test with water	15S	P
	Test with hexane	15S	P
	Legible after test	The marking is legible	P
	Label attached	No curling	P
1.6 (4)	**CONSTRUCTION**		P
1.6 (4.2)	Components replaceable without difficulty		P
1.6 (4.3)	Wireways smooth and free from sharp edges		P
1.6 (4.4)	**Lampholders**		**N**
1.6 (4.4.1)	Integral lampholder		N
1.6 (4.4.2)	Wiring connection		N
1.6 (4.4.3)	Lampholder for end-to-end mounting		N
1.6 (4.4.4)	Positioning		N
	- pressure test (N) ..... :		—
	After test the lampholder comply with relevant standard sheets and show no damage		N
	After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation		N
	- bending test (N) ..... :		—
	After test the lampholder have not moved from its position and show no permanent deformation		N

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Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.4.5)	Peak pulse voltage		N
1.6 (4.4.6)	Centre contact		N
1.6 (4.4.7)	Parts in rough service luminaires resistant to tracking		N
1.6 (4.4.8)	Lamp connectors		N
1.6 (4.4.9)	Caps and bases correctly used		N
1.6 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N
1.6 (4.5)	**Starter holders**		**N**
	Starter holder in luminaires other than class II		N
	Starter holder class II construction		N
1.6 (4.6)	**Terminal blocks**		**N**
	Tails		N
	Unsecured blocks		N
1.6 (4.7)	**Terminals and supply connections**		**N**
1.6 (4.7.1)	Contact to metal parts		N
1.6 (4.7.2)	Test 8 mm live conductor		N
	Test 8 mm earth conductor		N
1.6 (4.7.3)	Terminals for supply conductors		N
1.6 (4.7.3.1)	Welded method and material		N
	- stranded or solid conductor		N
	- spot welding		N
	- welding between wires		N
	- Type Z attachment		N
	- mechanical test according to 15.8.2		N
	- electrical test according to 15.9		N
	- heat test according to 15.9.2.3 and 15.9.2.4		N
1.6 (4.7.4)	Terminals other than supply connection		N
1.6 (4.7.5)	Heat-resistant wiring/sleeves		N
1.6 (4.7.6)	Multi-pole plug		N
	- test at 30 N		N
1.6 (4.8)	**Switches**		**N**
	- adequate rating		N
	- adequate fixing		N

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Clause	Requirement + Test	Result - Remark	Verdict
	- polarized supply		N
	- compliance with IEC 61058-1 for electronic switches		N
1.6 (4.9)	**Insulating lining and sleeves**		**N**
1.6 (4.9.1)	Retainment		N
	Method of fixing.....:		—
1.6 (4.9.2)	Insulated linings and sleeves:		N
	Resistant to a temperature > 20 °C to the wire temperature or		N
	a) & c) Insulation resistance and electric strength		N
	b) Ageing test. Temperature (°C).....:		N
1.6 (4.10)	**Double or reinforced insulation**		**N**
1.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		N
	Safe installation fixed luminaires		N
	Capacitors and switches		N
	Interference suppression capacitors according to IEC 60384-14		N
1.6 (4.10.2)	Assembly gaps:		N
	- not coincidental		N
	- no straight access with test probe		N
1.6 (4.10.3)	Retainment of insulation:		N
	- fixed		N
	- unable to be replaced; luminaire inoperative		N
	- sleeves retained in position		N
	- lining in lampholder		N
1.6 (4.11)	**Electrical connections and current-carrying parts**		**P**
1.6 (4.11.1)	Contact pressure		P
1.6 (4.11.2)	Screws:		N
	- self-tapping screws		N
	- thread- cutting screws		N
1.6 (4.11.3)	Screw locking:		N
	- spring washer		N
	- rivets		N

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Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.11.4)	Material of current-carrying parts		P
1.6 (4.11.5)	No contact to wood or mounting surface		P
1.6 (4.11.6)	Electro-mechanical contact systems		N
1.6 (4.12)	**Screws and connections (mechanical) and glands**		**P**
1.6 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N
	Torque test: torque (Nm); part.....:	Fixed the terminal blocks: Φ2.84mm, 0.5Nm	P
	Torque test: torque (Nm); part.....:	Fixed the cover: Φ3.83mm, 1.2Nm	P
	Torque test: torque (Nm); part.....:		N
1.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N
1.6 (4.12.4)	Locked connections:		N
	- fixed arms; torque (Nm)..... :		N
	- lampholder; torque (Nm).....:		N
	- push-button switches; torque 0,8 Nm..... :		N
1.6 (4.12.5)	Screwed glands; force (Nm)..... :		N
1.6 (4.13)	**Mechanical strength**		**P**
1.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm)..... :		P
	- other parts; energy (Nm).....:	0.35Nm	P
	1) live parts	Not access	P
	2) linings		P
	3) protection		P
	4) covers	No break	P
1.6 (4.13.3)	Straight test finger		P
1.6 (4.13.4)	Rough service luminaires		N
	- IP54 or higher		N
	a) fixed		N
	b) hand-held		N
	c) delivered with a stand		N
	d) for temporary installations and suitable for mounting on a stand		N
1.6 (4.13.6)	Tumbling barrel		N

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Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.14)	**Suspensions, fixings and means of adjusting**		**N**
1.6 (4.14.1)	Mechanical load:		P
	A) four times the weight	3.44 Kg X 4	P
	B) torque 2,5 Nm		P
	C) bracket arm; bending moment (Nm)..... :		N
	D) load track- mounted luminaires		N
	E) clip-mounted luminaires, glass-shelve. Thickness (mm) ..... :		N
	Metal rod. diameter (mm) .....:		N
	Fixed luminaire or independent control gear without fixing devices		N
1.6 (4.14.2)	Load to flexible cables		N
	Mass (kg) ..... :		—
	Stress in conductors (N/mm²) .....:		N
	Mass (kg) of semi-luminaire .....:		—
	Bending moment (Nm) of semi-luminaire .....:		N
1.6 (4.14.3)	Adjusting devices:		N
	- flexing test; number of cycles..... :		N
	- strands broken..... :		N
	- electric strength test afterwards		N
1.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N
1.6 (4.14.5)	Guide pulleys		N
1.6 (4.14.6)	Strain on socket-outlets		N
1.6 (4.15)	**Flammable materials**		**P**
	- glow- wire test 650°C..... :	See Test Table 1.15 (13.3.2)	P
	- spacing ≥30 mm		N
	- screen withstanding test of 13.3.1		N
	- screen dimensions		N
	- no fiercely burning material		P
	- thermal protection		N
	- electronic circuits exempted		N
1.6 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		N
	a) construction		N

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Clause	Requirement + Test	Result - Remark	Verdict
	b) temperature sensing control		N
	c) surface temperature		N
1.6 (4.16)	**Luminaires for mounting on normally flammable surfaces**		**P**
	No lamp control gear.....:	(compliance with Section 12)	N
1.6 (4.16.1)	Lamp control gear spacing:		P
	- spacing 35 mm		N
	- spacing 10 mm		P
1.6 (4.16.2)	Thermal protection:		N
	- in lamp control gear		N
	- external		N
	- fixed position		N
	- temperature marked lamp control gear		N
1.6 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N
1.6 (4.17)	**Drain holes**		**N**
	Clearance at least 5 mm		N
1.6 (4.18)	**Resistance to corrosion**		**N**
1.6 (4.18.1)	- rust- resistance		N
1.6 (4.18.2)	- season cracking in copper		N
1.6 (4.18.3)	- corrosion of aluminium		N
1.6 (4.19)	Igniters compatible with ballast		N
1.6 (4.20)	Rough service vibration		N
1.6 (4.21)	**Protective shield**		**N**
1.6 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N
	Shield of glass if tungsten halogen lamps		N
1.6 (4.21.2)	Particles from a shattering lamp not impair safety		N
1.6 (4.21.3)	No direct path		N
1.6 (4.21.4)	Impact test on shield		N
	Glow-wire test on lamp compartment.....:	See Test Table 1.15 (13.3.2)	N
1.6 (4.22)	Attachments to lamps not cause overheating or damage		N
1.6 (4.23)	Semi-luminaires comply Class II		N
1.6 (4.24)	**Photobiological hazards**		**P**

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Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		P
1.6 (4.24.2)	Retinal blue light hazard		P
	Luminaires with E_{thr} :		P
	a) Fixed luminaires		P
	- distance x m, borderline between RG1 and RG2... :		P
	- marking and instruction according 3.2.23		N
	b) Portable and handheld luminaires		N
	- marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778		N
	Portable luminaires for children IEC 60598-2-10 and Mains socket outlet nightlights IEC 60598-2-12 not exceed RG1 at 200 mm according to IEC/62778		N
1.6 (4.25)	**Mechanical hazard**		**P**
	No sharp point or edges		P
1.6 (4.26)	**Short-circuit protection**		**N**
1.6 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N
1.6 (4.26.2)	Short-circuit test with test chain according 4.26.3		N
	Test chain not melt through		N
	Test sample not exceed values of Table 12.1 and 12.2		N
1.6 (4.27)	**Terminal blocks with integrated screwless earthing contacts**		**N**
	Test according Annex V		N
	Pull test of terminal fixing (20 N)		N
	After test, resistance < 0,05 Ω		N
	Pull test of mechanical connection (50 N)		N
	After test, resistance < 0,05 Ω		N
	Voltage drop test, resistance < 0,05 Ω		N
1.6 (4.28)	**Fixing of thermal sensing control**		**N**
	Not plug-in or easily replaceable type		N
	Reliably kept in position		N
	No adhesive fixing if UV radiations from a lamp can degrade the fixing		N
	Not outside the luminaire enclosure		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Test of adhesive fixing:		N
	Max. temperature on adhesive material (°C)..... :		—
	100 cycles between t min and t max		N
	Temperature sensing control still in position		N
1.6 (4.29)	**Luminaires with non-replaceable light source**		**P**
	Not possible to replace light source		P
	Live part not accessible after parts have been opened by hand or tools		P
1.6 (4.30)	**Luminaires with non-user replaceable light source**		**N**
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		N
	Minimum two fixing means		N
1.6 (4.31)	**Insulation between circuits**		**N**
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3		N
	Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfil requirements according 4.31.1 – 4.31.3		N
1.6 (4.31.1)	SELV circuits		N
	Used SELV source		N
	Voltage ≤ ELV		N
	Insulating of SELV circuits from LV supply		N
	Insulating of SELV circuits from other non SELV circuits		N
	Insulating of SELV circuits from FELV		N
	Insulating of SELV circuits from other SELV circuits		N
	SELV circuits insulated from accessible parts according Table X.1		N
	Plugs not able to enter socket-outlets of other voltage systems		N
	Socket outlets does not admit plugs of other voltage systems		N
	Plugs and socket-outlets does not have protective conductor contact		N
1.6 (4.31.2)	FELV circuits		N
	Used FELV source		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Voltage ≤ ELV		N
	Insulating of FELV circuits from LV supply		N
	FELV circuits insulated from accessible parts according Table X.1		N
	Plugs not able to enter socket-outlets of other voltage systems		N
	Socket outlets does not admit plugs of other voltage systems		N
	Socket-outlets does not have protective conductor contact		N
1.6 (4.31.3)	Other circuits		N
	Other circuits insulated from accessible parts according Table X.1		N
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		N
	- conductive parts are connected together		N
	- test according 7.2.3 of above		N
	- conductive part not cause an electric shock in case of an insulation fault		N
	- equipotential bonding in master/slave applications		N
	- master luminaire provided with terminal for accessible conductive parts of slave luminaires		N
	- slave luminaire constructed as class I		N
1.6 (4.32)	**Overvoltage protective devices**		**N**
	Comply with IEC 61643-11		N
	External to control gear and connected to earth:		N
	- only in fixed luminaires		N
	- only connected to protective earth		N

1.7 (11)	**CREEPAGE DISTANCES AND CLEARANCES**		P
1.7 (11.2)	Creepage distances and clearances.....:	See Table 1.7 (11.2)	P
	Working voltage (V).....:	220-240V	—
	Rated pulse voltage (kV).....:	--	—
	Voltage form.....:	Sinusoidal ☒ Non-sinusoidal ☐	—
	PTI.....:	< 600 ☒ ≥ 600 ☐	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Impulse withstand category (Normal category II) (Category III Annex U)	Category II ☒ Category III ☐	—
1.8 (7)	**PROVISION FOR EARTHING**		**P**
1.8 (7.2.1 + 7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		P
	Resistance < 0,5 Ω.....:	0.061Ω	P
	Self-tapping screws used		N
	Thread-forming screws		N
	Thread-forming screw used in a grove		N
	Earth makes contact first		P
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N
	Protective earthing of the luminaire not via built-in control gear		N
1.8 (7.2.2 + 7.2.3)	Earth continuity in joints, etc.		P
1.8 (7.2.4)	Locking of clamping means		P
	Compliance with 4.7.3		P
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N
1.8 (7.2.5)	Earth terminal integral part of connector socket		N
1.8 (7.2.6)	Earth terminal adjacent to mains terminals		P
1.8 (7.2.7)	Electrolytic corrosion of the earth terminal		N
1.8 (7.2.8)	Material of earth terminal		P
	Contact surface bare metal		P
1.8 (7.2.10)	Class II luminaire for looping-in		N
	Double or reinforced insulation to functional earth		N
1.8 (7.2.11)	Earthing core coloured green-yellow		P
	Length of earth conductor		N

1.9 (14)	**SCREW TERMINALS**		N
	Separately approved; component list.....:	(see Annex 1)	N
	Part of the luminaire.....:	(see Annex 3)	N

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Clause	Requirement + Test	Result - Remark	Verdict
1.9 (15)	**SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS**		N
	Separately approved; component list.....:	(see Annex 1)	N
	Part of the luminaire.....:	(see Annex 4)	N
1.10 (5)	**EXTERNAL AND INTERNAL WIRING**		P
1.10 (5.2)	**Supply connection and external wiring**		**P**
1.10 (5.2.1)	Means of connection.....:	Terminals	P
	Outdoor luminaire has not PVC insulated external wiring if not class III or SELV ≤ 25 V a.c./60 V d.c. or protected from outdoor environment		N
1.10 (5.2.2)	Type of cable.....:		N
	Nominal cross-sectional area (mm²)..... :		N
	Cables equal to IEC 60227 or IEC 60245		N
1.10 (5.2.3)	Type of attachment, X, Y or Z		N
1.10 (5.2.5)	Type Z not connected to screws		N
1.10 (5.2.6)	Cable entries:		N
	- suitable for introduction		N
	- adequate degree of protection		N
1.10 (5.2.7)	Cable entries through rigid material have rounded edges		N
1.10 (5.2.8)	Insulating bushings:		N
	- suitably fixed		N
	- material in bushings		N
	- material not likely to deteriorate		N
	- tubes or guards made of insulating material		N
1.10 (5.2.9)	Locking of screwed bushings		N
1.10 (5.2.10)	Cord anchorage:		N
	- covering protected from abrasion		N
	- clear how to be effective		N
	- no mechanical or thermal stress		N
	- no tying of cables into knots etc.		N
	- insulating material or lining		N
1.10 (5.2.10.1)	Cord anchorage for type X attachment:		N

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Clause	Requirement + Test	Result - Remark	Verdict
	a) at least one part fixed		N
	b) types of cable		N
	c) no damaging of the cable		N
	d) whole cable can be mounted		N
	e) no touching of clamping screws		N
	f) metal screw not directly on cable		N
	g) replacement without special tool		N
	Glands not used as anchorage		N
	Labyrinth type anchorages		N
1.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		N
1.10 (5.2.10.3)	Tests:		N
	- impossible to push cable; unsafe		N
	- pull test: 25 times; pull (N)..... :		N
	- torque test: torque (Nm)..... :		N
	- displacement ≤ 2 mm		N
	- no movement of conductors		N
	- no damage of cable or cord		N
	- function independent of electrical connection		N
1.10 (5.2.11)	External wiring passing into luminaire		N
1.10 (5.2.12)	Looping- in terminals		N
1.10 (5.2.13)	Wire ends not tinned		N
	Wire ends tinned: no cold flow		N
1.10 (5.2.14)	Mains plug same protection		N
	Class III luminaire plug		N
	No unsafe compatibility		N
1.10 (5.2.16)	Appliance inlets (IEC 60320)		N
	Installation couplers (IEC 61535)		N
	Other appliance inlet or connector according relevant IEC standard		N

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Clause	Requirement + Test	Result - Remark	Verdict
1.10 (5.2.17)	No standardized interconnecting cables properly assembled		N
1.10 (5.2.18)	Used plug in accordance with		N
	- IEC 60083		N
	- other standard		N
1.10 (5.3)	**Internal wiring**		**P**
1.10 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		P
	- not delivered/ mounting instruction		N
	- factory assembled		P
	socket outlet loaded (A).....:		N
	- temperatures.....:	(see Annex 2)	P
	Green- yellow for earth only		P
1.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P
	Cross-sectional area (mm²)..... :		P
	Insulation thickness		P
	Extra insulation added where necessary		N
1.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		P
	Adequate cross-sectional area and insulation thickness		P
1.10 (5.3.1.3)	Double or reinforced insulation for class II		N
1.10 (5.3.1.4)	Conductors without insulation		P
1.10 (5.3.1.5)	SELV current-carrying parts		N
1.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N
1.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N
	Joints, raising/lowering devices		N
	Telescopic tubes etc.		N
	No twisting over 360°		P

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Clause	Requirement + Test	Result - Remark	Verdict
1.10 (5.3.3)	Insulating bushings:		N
	- suitable fixed		N
	- material in bushings		N
	- material not likely to deteriorate		N
	- cables with protective sheath		N
1.10 (5.3.4)	Joints and junctions effectively insulated		P
1.10 (5.3.5)	Strain on internal wiring		N
1.10 (5.3.6)	Wire carriers		N
1.10 (5.3.7)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N
1.11 (8)	**PROTECTION AGAINST ELECTRIC SHOCK**		P
1.11 (8.2.1)	Live parts not accessible		P
	Basic insulated parts not used on the outer surface without appropriate protection		P
	Basic insulated parts not accessible with standard test finger on portable, settable and adjustable luminaires		N
	Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires		P
	Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements		N
	Basic insulation only accessible under lamp or starter replacement		N
	Protection in any position		P
	Double-ended tungsten filament lamp		N
	Insulation lacquer not reliable		P
	Double-ended high pressure discharge lamp		N
	Relevant warning according to 3.2.18 fitted to the luminaire		N
1.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N
1.11 (8.2.3.a)	Class II luminaire:		N
	- basic insulated metal parts not accessible during starter or lamp replacement		N

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Clause	Requirement + Test	Result - Remark	Verdict
	- basic insulation not accessible other than during starter or lamp replacement		N
	- glass protective shields not used as supplementary insulation		N
1.11 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N
1.11 (8.2.3.c)	SELV circuits with exposed current carrying parts:		N
	Ordinary luminaire:		N
	- touch current .....:		N
	- no-load voltage.....:		N
	Other than ordinary luminaire:		N
	- nominal voltage .....:		N
1.11 (8.2.4)	Portable luminaire have protection independent of supporting surface		N
1.11 (8.2.5)	Compliance with the standard test finger or relevant probe		P
1.11 (8.2.6)	Covers reliably secured		N
1.11 (8.2.7)	Discharging of capacitors ≥ 0,5 μF		N
	Portable plug connected luminaire with capacitor		N
	Other plug connected luminaire with capacitor		N
	Discharge device on or within capacitor		N
	Discharge device mounted separately		N

1.12 (12)	**ENDURANCE TEST AND THERMAL TEST**		P
1.12 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 4.13		—
1.12 (12.3)	Endurance test:		P
	- mounting- position..... :	According to manual	—
	- test temperature (°C)..... :	35°C	—
	- total duration (h).....:	240h	—
	- supply voltage: Un factor; calculated voltage (V)...:	264V	—
	- lamp used..... :	LED	—
1.12 (12.3.2)	After endurance test:		P
	- no part unserviceable		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- luminaire not unsafe		P
	- no damage to track system		N
	- marking legible		P
	- no cracks, deformation etc.		P
1.12 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
1.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	P
1.12 (12.6)	Thermal test (failed lamp control gear condition):		N
1.12 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A) ..... :		—
	- case of abnormal conditions.....:		—
	- electronic lamp control gear		N
	- measured winding temperature (°C): at 1,1 Un .....:		—
	- measured mounting surface temperature (°C) at 1,1 Un.....:		N
	- calculated mounting surface temperature (°C) .....:		N
	- track-mounted luminaires		N
1.12 (12.6.2)	Temperature sensing control		N
	- case of abnormal conditions.....:		—
	- thermal link		N
	- manual reset cut-out		N
	- auto reset cut-out		N
	- measured mounting surface temperature (°C)..... :		N
	- track-mounted luminaires		N
1.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N
1.12 (12.7.1)	Luminaire without temperature sensing control		N
1.12 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N
	Test method 12.7.1.1 or Annex W .....:		—
	Test according to 12.7.1.1:		N
	- case of abnormal conditions.....:		—
	- Ballast failure at supply voltage (V) .....:		—
	- Components retained in place after the test		N

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Clause	Requirement + Test	Result - Remark	Verdict
	- Test with standard test finger after the test		N
	Test according to Annex W:		N
	- case of abnormal conditions.....:		—
	- measured winding temperature (°C): at 1,1 Un.....:		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un.....:		—
	- calculated temperature of fixing point/exposed part (°C).....:		—
	Ball-pressure test.....:		N
1.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N
	- case of abnormal conditions.....:		—
	- measured winding temperature (°C): at 1,1 Un.....:		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un.....:		—
	- calculated temperature of fixing point/exposed part (°C).....:		—
	Ball-pressure test.....:		N
1.12 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N
	- case of abnormal conditions.....:		—
	- Components retained in place after the test		N
	- Test with standard test finger after the test		N
1.12 (12.7.2)	Luminaire with temperature sensing control		N
	- thermal link.....:	Yes ☐ No ☐	—
	- manual reset cut-out.....:	Yes ☐ No ☐	—
	- auto reset cut-out.....:	Yes ☐ No ☐	—
	- case of abnormal conditions.....:		—
	- highest measured temperature of fixing point/ exposed part (°C):.....:		—
	Ball-pressure test:.....:	See Table 1.15 (13.2.1)	N

1.13 (9)	**RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE**	P
1.13 (-)	If IP > IP 20 the order of tests as specified in clause 1.12	--

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Clause	Requirement + Test	Result - Remark	Verdict
1.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		—
	- classification according to IP.....:	IP20	—
	- mounting position during test.....:	Use normal	—
	- fixing screws tightened; torque (Nm).....:		—
	- tests according to clauses.....:		—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N
	b) no talcum in dust- tight luminaire		N
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		N
	d) i) For luminaires without drain holes – no water entry		N
	d) ii) For luminaires with drain holes – no hazardous water entry		N
	e) no water in watertight luminaire		N
	f) no contact with live parts (IP 2X)		N
	f) no entry into enclosure (IP 3X and IP 4X)		N
	f) no contact with live parts (IP3X and IP4X)		N
	g) no trace of water on part of lamp requiring protection from splashing water		N
	h) no damage of protective shield or glass envelope		N
1.13 (9.3)	Humidity test 48 h	95%R.H 30℃	P

1.14 (10)	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		P
1.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø .....:		—
	Insulation resistance (MΩ).....:		—
	SELV		N
	- between current-carrying parts of different polarity:		N
	- between current-carrying parts and mounting surface.....:		N
	- between current-carrying parts and metal parts of the luminaire.....:		N

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Clause	Requirement + Test	Result - Remark	Verdict
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts.....:		N
	- Insulation bushings as described in Section 5 .....:		N
	Other than SELV		P
	- between live parts of different polarity.....:		N
	- between live parts and mounting surface.....:	>2MΩ	P
	- between live parts and metal parts.....:	>2MΩ	P
	- between live parts of different polarity through action of a switch.....:		N
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts.....:	>2MΩ	P
	- Insulation bushings as described in Section 5 .....:		N
1.14 (10.2.2)	Electric strength test		P
	Dummy lamp		N
	Luminaires with ignitors after 24 h test		N
	Luminaires with manual ignitors		N
	Test voltage (V).....:		N
	SELV		N
	- between current-carrying parts of different polarity:		N
	- between current-carrying parts and mounting surface.....:		N
	- between current-carrying parts and metal parts of the luminaire.....:		N
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts.....:		N
	- Insulation bushings as described in Section 5 .....:		N
	Other than SELV		P
	- between live parts of different polarity.....:		N
	- between live parts and mounting surface.....:	1480V, No broken.	P
	- between live parts and metal parts.....:	1480V, No broken.	P
	- between live parts of different polarity through action of a switch.....:		N

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Clause	Requirement + Test	Result - Remark	Verdict
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :	1480V, No broken.	P
	- Insulation bushings as described in Section 5 ..... :		N
1.14 (10.3)	Touch current or protective conductor current (mA). :	0.3mA limits: 3.5mA	P
1.15 (13)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		P
1.15 (13.2.1)	Ball-pressure test..... :	See Test Table 1.15 (13.2.1)	P
1.15 (13.3.1)	Needle-flame test (10 s)..... :	See Test Table 1.15 (13.3.1)	N
1.15 (13.3.2)	Glow- wire test (650°C)..... :	See Test Table 1.15 (13.3.2)	P
1.15 (13.4)	Proof tracking test (IEC 60112)..... :	See Test Table 1.15 (13.4)	N

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Clause	Requirement + Test	Result - Remark	Verdict

1.7 (11.2)	**TABLES: Creepage distances and clearances**	P
Table 11.1	**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 ≥ 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
Measured Live parts to enclosure			**>2.5**			
Required supplementary insulation PTI ≥ 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						
Clearances						
Required basic insulation	0,2	0,8	1,5	3	4	5,5
Measured Live parts to enclosure			**>1.5**			
Required supplementary insulation	-	0,8	1,5	3	4	5,5
Measured						
Required reinforced insulation	-	1,6	3	6	8	11
Measured						

Table 11.2	**Minimum distances (mm) for non-sinusoidal pulse voltages**	**N**

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Clause	Requirement + Test	Result - Remark	Verdict

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							
Rated pulse voltage (peak kV)	50	60	80	100	-	-	-
Required clearances	75	90	130	170	-	-	-
Measured							

1.15 (13.2.1)	**TABLE: Ball Pressure Test of Thermoplastics**		**P**
Allowed impression diameter (mm) .....:		⩽ 2mm	—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)
Cover	--	75	0.82
Terminal blocks	--	125	0.68
Supplementary information:			

1.15 (13.3.1)	**TABLE: Needle-flame test (IEC 60695-11-5)**				P
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Terminal blocks	--	10	No	3	P
--					
Supplementary information:					

1.15 (13.3.2)	**TABLE: Glow-wire test (IEC 60695-2-11)**	**P**
Glow wire temperature .....:	650°C	—

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Clause	Requirement + Test	Result - Remark	Verdict

Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Cover	--	30	No	0	P
--					
--					
Any flame or glowing of the sample extinguished within 30 s of withdrawing the glow-wire, and any burning or molten drop did not ignite the underlying parts (Yes/No)..... :					
Supplementary information:					

1.15 (13.4)	**TABLE: Proof tracking test (IEC 60112)**				**N**
Test voltage PTI ..... :		175 V			—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
Supplementary information:					

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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 1	**TABLE: Critical components information**	**P**

Object / part No.	**Code**	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
Connector (Used for track power input)	B	Degson Electronics Co. Ltd.	8EDGKRMB-5.0 8EDGKMB-5.0	400V, 20A	VDE 0627 IEC 61995	VDE 40038728
Feed-in Box	B	Degson Electronics Co. Ltd.	DG222 Series	450V, 24A	VDE 0613	VDE 40028245
(alternative)	D	WAGO Kontakttechnik GmbH & Co. KG	224 Series	450V, 24A	VDE 0613	VDE 40022792
Connector	B	Shenzhen CoreShine Optoelectronics Co., Ltd	CFC1	400V, 10A	VDE 0627	VDE 40014727
Terminal	B	WAGO Kontakttechnik GmbH& Co.KG	2273-..	450V, 0.5-2.5mm^2	DIN EN 60998-2-2 60998-1	VDE 40029794
Internal wire	B	Guangdong Tianhong Cable Co., Ltd.	H07V-U	2.5mm^2 450v750V	VDE 0281	VDE 40039796
(Alternative)	D	Guangdong Tianhong Cable Co., Ltd.	1015	105°C, 13AWG	--	UL E337280
(Alternative)	D	Guangdong Tianhong Cable Co., Ltd.	H07V-R	2.5mm^2 450v750V	VDE 0285	VDE 40039796
Earth wire	B	Guangdong Tianhong Cable co., Ltd.	H07V-K	1.5mm2, 450V/750V	VDE 0285	VDE 40039796
(alternative)	D	Guangdong Tianhong Cable co., Ltd.	1015	105°C, 15 AWG	--	UL E337280
(alternative)	D	Guangdong Tianhong cable Co., Ltd.	H07V-U	1.5mm2, 450V/750V	VDE 0281	VDE 40039796
Output wire of LED driver	B	Guangdong Tianhong Cable co., Ltd.	1015	105°C, 20AWG	--	UL E337280
(alternative)	D	Guangdong Tianhong Cable co., Ltd.	H07V-U	0.5mm2, 450V/750V	VDE 0281	VDE 40039796
LED board	B	SHENZHEN YIFANG ELECTRONICS CO LTD	YF-M	V-0, 130°C	--	UL E320003

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Clause	Requirement + Test	Result - Remark	Verdict

LED Cover (non-transparent)	B	GUANGDONG WAYLAM ENGINEERING PLASTICS CO LTD	PBT RG301(a)	PBT, V-0	--	UL E257285
LED Cover (transparent)	B	TEIJIN LIMITED RESIN AND PLASTIC	L-1250Z(#)(F1)	V-2, 80°C	--	UL E50075
LED (for all models)	D	EVERLIGHT ELECTRONICS CO., LTD	2835 67-21S Series	2.8Vdc-3.4Vdc, IF=180mA 2700K/3000K 3500K/4000K 5000K/6000K White light	--	Test with appliance
LED controlgear	B	Shenzhen Coreshine Optoelectronics Co., Ltd.	4549D	Input:220-240V~, 50/60Hz, 0,47A output:55-70V,1A, 70W built-in SELV, ta:60°C, tc:75°C	EN 61347-1 EN 61347-2-13	Test with Appliance

Supplementary information:

[1] Provided evidence ensures the agreed level of compliance.

The codes above have the following meaning:

A - The component is replaceable with another one, also certified, with equivalent characteristics

B - The component is replaceable if authorised by the test house

C - Integrated component tested together with the appliance

D - Alternative component

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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	**TABLE: Temperature measurements, thermal tests of Section 12**		P
	Type reference.....:	VT-4549D	—
	Lamp used.....:	LED	—
	Lamp control gear used.....:	--	—
	Mounting position of luminaire.....:	Normal	—
	Supply wattage (W).....:	70.8	—
	Supply current (A).....:	0.286	—
	Calculated power factor.....:	--	—
	Table: measured temperatures corrected for ta = 25 °C:		
	- abnormal operating mode.....:	LED Driver output: short-circuit	—
	- test 1: rated voltage.....:	--	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage.....:	254.4V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage.....:	--	—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage.....:	264V	—
	Through wiring or looping-in wiring loaded by a current of A during the test .....:	--	—

Temperature measurements, (°C)

Part	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1	test 2	test 3	limit	test 4	limit
LED PCB	--	85 .3	--	130	--	--
Tc	--	63.8	--	75	43.5	175
Internal wire	--	60.5	--	85	--	--
Power cord	--	47.6	--	60	--	--
Enclosure(mounting surface)	--	65.8	--	90	42.6	130
Cover	--	72.3	--	90	--	--
Ambient	--	40.1	--	--	40.2	--

Supplementary information:

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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 3	**Screw terminals (part of the luminaire)**		N
(14)	**SCREW TERMINALS**		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 (mm²).....:		—
(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).....:	M	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

ANNEX 4	**Screwless terminals (part of the luminaire)**		N
(15)	**SCREWLESS TERMINALS**		N
(15.2)	Type of terminal.....:		—
	Rated current (A).....:		—
(15.3.1)	Material		N
(15.3.2)	Clamping		N

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Clause	Requirement + Test	Result - Remark	Verdict
(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
(15.5.1)	Terminals internal wiring		N
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples).....:		N
(15.5.1.2)	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
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples)..... :		N
(15.6)	Terminals external wiring		N
	Terminal size and rating		N
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) ..... :		N
	Pull test pin or tab terminals (4 samples); pull (N) .....:		N

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Clause	Requirement + Test	Result - Remark	Verdict

(15.6.3.1)	**TABLE: Contact resistance test**										N
	Voltage drop (mV) after 1 h										—
terminal		1	2	3	4	5	6	7	8	9	10
voltage drop (mV)											
	Voltage drop of two inseparable joints										
	Voltage drop after 10th alt. 25th cycle										
	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										
	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										
	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										
	Max. allowed voltage drop (mV).....:										—
terminal		1	2	3	4	5	6	7	8	9	10
voltage drop (mV)											

Supplementary information:

Photo 1 Overview

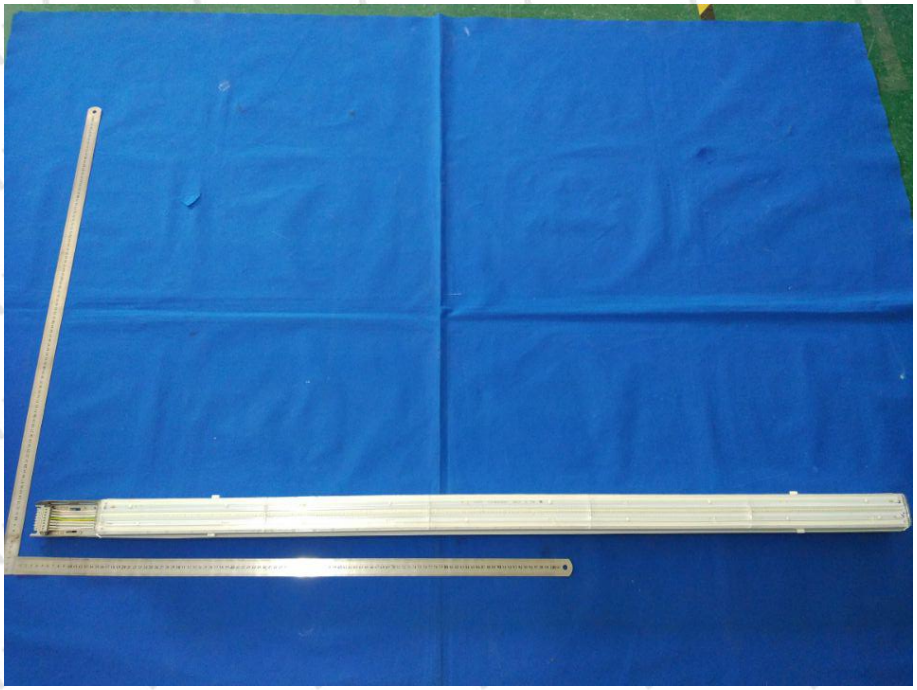


Photo 2 Bottom view

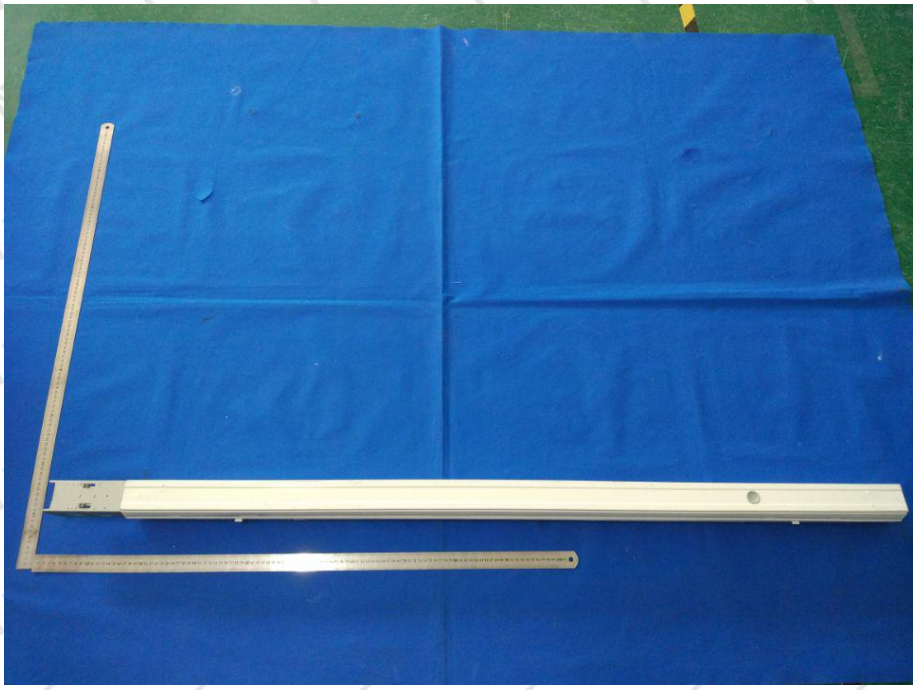
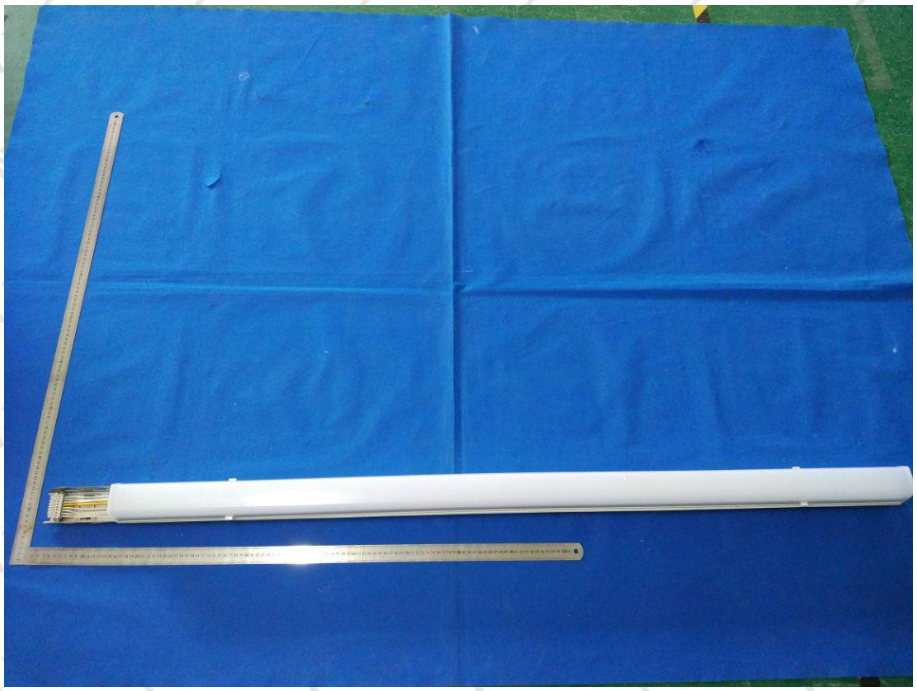


Photo 3 Inside view

Photo 4 Model CFLS-1550



EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
4 (4)	**GENERAL REQUIREMENTS**		**P**
	Insulation materials according requirements in Annex N of IEC 61347-1	(see Annex N)	N
	Compliance of independent controlgear enclosure with IEC 60 598- 1		N
	Built-in magnetic ballast with double or reinforced insulation comply with Annex I of IEC 61347-1		N
	Built-in electronic controlgear with double or reinforced insulation comply with Annex O of IEC 61347-1	(see Annex O)	N
	SELV controlgear comply with Annex L of IEC 61347-1	(see Annex L)	N
	Independent SELV controlgear comply with Annex I of this part 2	(see Annex I)	N
6 (6)	**CLASSIFICATION**		**P**
	Built-in controlgear ..... :	Yes ☒ No ☐	—
	Independent controlgear..... :	Yes ☐ No ☒	—
	Integral controlgear ..... :	Yes ☐ No ☒	—
	SELV-equivalent or isolating controlgear ..... :	Yes ☐ No ☒	—
	Auto-wound controlgear ..... :	Yes ☐ No ☒	—
	Independent SELV controlgear..... :	Yes ☐ No ☒	—
7 (7)	**MARKING**		P
7.1 (7.1)	Mandatory markings		P
	a) mark of origin	(see marking plate)	P
	b) model number or type reference		P
	c) symbol for independent controlgear, if applicable		N
	d) correlation between interchangeable parts and controlgear marked		N
	e) rated supply voltage (V)	220-240V	P
	supply frequency (Hz)	50/60Hz	P
	supply current (A)	0.47A	P
	f) earthing symbol		P
	k) wiring diagram		P
	l) value of t_c	Tc: 75℃	P
	m) symbol for declared temperature		N
	Constant voltage type:	Yes ☐ No ☒	—
	- rated output voltage (V) ..... :		P
	Constant current type:	Yes ☒ No ☐	—
	- rated output current (A) ..... :	1.0A	P
	- rated maximum output voltage (V) ..... :	70V	P
	- 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

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Clause	Requirement + Test	Result - Remark	Verdict
	h) declaration on protection against accidental contact		P
	i) cross-section of conductors (mm²)		N
	j) number, type and wattage of lamp(s)		P
	- declaration of mains connected windings		N
	- declaration for SELV-equivalent controlgear		N
8 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		**P**
- (10.1)	Controlgear protected against accidental contact with live parts		P
- (A2)	Voltage measured with 50 kΩ	(see Annex A)	N
- (A3)	Voltage > 35 V peak or > 60 V d.c. or protective impendance device	(see Annex A)	N
- (10.1)	Lacquer or enamel not used for protection or insulation		P
	Adequate mechanical strength on parts providing protection		P
- (10.2)	Capacitors > 0,5 μF: voltage after 1 min (V): < 50 V ..... :		P
- (10.3)	Controlgear providing SELV		N
	Accessible conductive parts are insulated from live parts by double or reinforced insulation in SELV controlgear		N
	No connection between output circuit and the body or protective earthing curcuit		N
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		N
	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		N
- (10.4)	Accessible conductive parts in SELV circuits		N
	Output voltage under load ≤ 25 V r.m.s. or ≤ 60 V d.c.		N
	If output voltage > 25 V r.m.s. or > 60 V d.c.; No load output ≤ 35 V peak or ≤ 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		N
	Y1 or Y2 capacitors comply with IEC 60384-14		N
	Resistors comply with test (a) in 14.1 of IEC 60065		N

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Clause	Requirement + Test	Result - Remark	Verdict
8.1	SELV-equivalent controlgear accessible parts are insulated from live parts by double or reinforced insulation according 8.6 and 13.1 in IEC 60065		N
8.2	Exposed terminals of SELV or SELV-equivalent controlgear if: - the rated or maximum rated output voltages ≤ 25 V r.m.s. - the no-load output voltage ≤ 30 V r.m.s. or 33 √2 V peak		N
	Insulated terminals if convertor with rated output voltage > 25 V		N
	One capacitor Y1 or two capacitors Y2 complying with IEC 60384-14 of the same values used in series between SELV or SELV-equivalent output and primary circuits		N
	Other components bridging the separating transformer complying with IEC 60065, clause 14		N
9 (8)	**TERMINALS**		**N**
	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**
	Separately approved; component list	(see Annex 1)	N
	Part of the controlgear	(see Annex 3)	N
10 (9)	**PROVISION FOR PROTECTIVE EARTHING**		**P**
- (9.1)	Provisions for protective earthing		P
	Terminal complying with clause 8		P
	Locked against loosening and not possible to loosen by hand		P
	Not possible to loosen clamping means unintentionally on screwless terminals		N
	Earthing via means of fixing		P
	Earthing terminal only used for the earthing of the control gear		P
	All parts of material minimizing the danger of electrolytic corrosion		N
	Made of brass or equivalent material		N
	Contact surface bare metal		P
- (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		P
	Test with a current of 25 A between earthing terminal and each of the accessible metal parts; measured resistance (Ω) at ≥ 10 A according 7.2.3 of IEC 60598-1: < 0,5 Ω ..... :	0.056Ω	P
- (9.4)	Earthing of built-in lamp controlgear		P

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Clause	Requirement + Test	Result - Remark	Verdict
	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		P
- (9.5)	Earthing via independent controlgear		N
- (9.5.1)	Earth connection to other equipment		N
	Looping or through connection, conductor min. 1,5 mm² 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		N
	Test with a current of 25 A between input and output earth terminals; measured resistance (Ω) between earthing terminal and each of the accessible metal parts at ≥ 10 A according 7.2.3 of IEC 60598-1: < 0,5 Ω ..... :		N
	Output earthing terminal marked as in 7.1 t) of IEC 61347-1		N
11 (11)	**MOISTURE RESISTANCE AND INSULATION**		**P**
	After storage 48 h at 91- 95% relative humidity and 20- 30 °C measuring of insulation resistance with d.c. 500 V (MΩ):		P
	For basic insulation ≥ 2 MΩ ..... :	L to N>100MΩ	P
	For double or reinforced insulation ≥ 4 MΩ ..... :	Live parts to enclosure>100MΩ	P
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		N
11 (-)	Adequate insulation between input and output terminals not bounded together in SELV-equivalent controlgear		N
12 (12)	**ELECTRIC STRENGTH**		**P**
	Immediately after clause 11 electric strength test for 1 min		P
	Basic insulation for SELV, test voltage 500 V		N
	Working voltage ≤ 50 V, test voltage 500 V		N
	Working voltage > 50 V ≤ 1000 V, test voltage (V):		P
	Basic insulation, 2U + 1000 V	L to N: 1480V	P
	Supplementary insulation, 2U + 1000 V		N
	Double or reinforced insulation, 4U + 2000 V	L/N to enclosure: 1480V	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
12 (-)	Windings in separating transformers in SELV-equivalent convertors according to 14.3.2 of IEC 60065		N

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Clause	Requirement + Test	Result - Remark	Verdict
14 (14)	**FAULT CONDITIONS**		**P**
- (14)	When operated under fault conditions the controlgear:		P
	- does not emit flames or molten material		P
	- 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)	P
	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	(see appended table)	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 ≥ 1 MΩ ..... :	Live parts to enclosure: >100MΩ	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	Not ignite	P
- (14.6)	Relevant fault condition tests with high-power supply		—
14 (-)	Temperature declared thermally protected lamp controlgear fulfil requirements in Annex C		N
15 (-)	**TRANSFORMER HEATING**		**N**
	Windings of separating transformer in a SELV-equivalent controlgear fulfil the requirements according to 7.1 and 11.2 of IEC 60065		N
15.1 (-)	Normal operation		N
	Temperatures do not exceed the changed values of the values in column 2 of Table 3 of IEC 60065, in respect to relevant ambient temperature at t_c, under normal operation		N
15.2 (-)	Abnormal operation		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Temperatures do not exceed the changed values of the values in column 3 of Table 3 of IEC 60065, in respect to relevant ambient temperature at t_c, under abnormal conditions of Cl. 16 and fault conditions of Cl. 14		N
	Ambient temperature at t_c ..... :		—
16 (-)	**ABNORMAL CONDITIONS**		**P**
16.1 (-)	Control gear which are of the constant voltage output type:		P
	a) No LED module inserted	Unit shut down, no hazard	P
	b) Double LED modules or equivalent load connected to the output terminals	Unit shut down, no hazard	P
	c) Output terminal short-circuited (20 cm and 200 cm or declared length)	Unit shut down, no hazard	P
	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		P
16.2 (-)	Control gear which are of the constant current output type		N
	a) No LED module connected		N
	b) Double the LED modules or equivalent load connected in series to the output terminals		N
	c) Output terminal short-circuited (20 cm and 200 cm or declared length)		N
	Maximum output voltage not exceeded		N
	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		N
17 (15)	**CONSTRUCTION**		**P**
- (15.1)	Wood, cotton, silk, paper and similar fibrous material		—
	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	No such devices	N
	Plugs and socket-outlets for SELV comply with IEC 60906-3 and IEC 60884-2-4		N
	Plugs and socket-outlets for SELV ≤ 3 A, ≤ 25 V r.m.s. or ≤ 60 V d.c. and ≤ 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

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Clause	Requirement + Test	Result - Remark	Verdict
	- socket-outlets without protective earth		N
17 (-)	Socket-outlet in the output circuit does not accept plugs complying with IEC 60083 and IEC 60906		N
	Not possible to engage plugs accepted by socket-outlet in the output circuit with socket-outlets complying with IEC 60083 and IEC 60906		N
18 (16)	**CREEPAGE DISTANCES AND CLEARANCES**		**P**
- (16)	Creepage distances and clearances according to Table 3 and 4, as appropriate	(see appended table)	P
	Controlgears providing SELV comply with L.1 in Annex L		N
	Insulating lining of metallic enclosures		N
	Basic insulation on printed boards tested according to clause 14		P
	Distances subjected to both sinusoidal voltage as non-sinusoidal pulses not less than value in either Table 3 or 4		P
	Creepage distances not less than minimum clearance		P
19 (17)	**SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS**		**N**
	Screws, current-carrying parts and connections in compliance with IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1)		N
(4.11)	Electrical connections		N
(4.11.1)	Contact pressure		N
(4.11.2)	Screws:		N
	- self-tapping screws		N
	- thread- cutting screws		N
(4.11.3)	Screw locking:		N
	- spring washer		N
	- rivets		N
(4.11.4)	Material of current-carrying parts		N
(4.11.5)	No contact to wood or mounting surface		N
(4.11.6)	Electro-mechanical contact systems		N
(4.12)	Mechanical connections and glands		N
(4.12.1)	Screws not made of soft metal		N
	Screws of insulating material		N
	Torque test: torque (Nm); part.....:		N
	Torque test: torque (Nm); part.....:		N
	Torque test: torque (Nm); part.....:		N
(4.12.2)	Screws with diameter < 3 mm 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
20 (18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		**P**
- (18.1)	Ball-pressure test:		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- part tested; temperature (°C)..... :	Bobbin of transformer: 125°C, measured: 1.0mm<2mm	P
	- part tested; temperature (°C)..... :	Terminal blocks: 125°C, measured: 0.9mm<2mm	P
	- part tested; temperature (°C)..... :		N
- (18.2)	Test of printed boards:	See cl. 18.3 & cl. 18.4	P
	- part tested..... :		N
	- part tested..... :		N
- (18.3)	Glow-wire test (650°C):		P
	- part tested..... :	Terminal blocks , no flame	P
	- part tested..... :		N
- (18.4)	Needle flame test (10 s):		P
	- part tested..... :	PCB	P
	- part tested..... :	Bobbin of transformer	P
	- part tested..... :		N
- (18.5)	Tracking test:		N
	- part tested..... :		N
	- part tested..... :		N

21 (19)	**RESISTANCE TO CORROSION**		**N**
	- test according 4.18.1 of IEC 60598-1		N
	- adequate varnish on the outer surface		N

14	**TABLE: tests of fault conditions**	**P**
Part	Simulated fault	Hazard
C18	s-c, unit shut down, no hazard	NO
C15	s-c, unit shut down, no hazard	NO
DB1	s-c, fuse operated immediately	NO
Output	s-c, unit shut down, no hazard	NO
Output	o-p, unit shut down, no hazard	NO

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

18 (16)	TABLES: Creepage distances and clearances						P
Table 3	Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages						—
RMS working voltage (V) not exceeding		50	150	250	500	750	1000
Creepage distances							
Required basic insulation, PTI ≥ 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
Measured		-	-	3.0	-	-	-
Required supplementary insulation PTI ≥ 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		-	-	-	-	-	-
Clearances							
Required basic insulation		0,2	0,8	1,5	3	4	5,5
Measured		-	-	3.0	-	-	-
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						N
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	-	-	-	-	-	-	-
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
A	**ANNEX A - TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS A LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK**		N
A.1	Comply with A.2 or A.3		N
A.2	Voltage ≤ 35 V peak or ≤ 60 V d.c .....:		N
A.3	If voltage > 35 V peak or > 60 V d.c. or protective impendance device; touch current does not exceed 0,7 mA (peak) or 2 mA d.c. .....:		N
	Comply with Annex G of IEC 60598-1		N
C	**ANNEX C – PARTICULAR REQUIREMENTS FOR ELECTRONIC LAMP CONTROLGEAR WITH MEANS OF PROTECTION AGAINST OVERHEATING**		N
C3	**GENERAL REQUIREMENTS**		**N**
C3.1	Thermal protection means integral with the convertor, protected against mechanical damage		N
	Renewable only by means of a tool		N
	If function depending on polarity, for cord-connected 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
C5	**CLASSIFICATION**		**N**
	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
C6	**MARKING**		**N**
C6.1	Symbol for temperature declared thermally protected ballasts		N
C6.2	Declaration of the type of protection provided		N
C7	**LIMITATION OF HEATING**		**N**
C7.1	Preselection test:		N
	Test sample placed for at least 12 h in an oven having temperature (t_c - 5) K		N
	No operation of the protection device		N
C7.2	Functioning of protection means:		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Normal operation of the sample in a test enclosure according to Annex D at an ambient temperature such that (t_c +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 convertor 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
	Ballasts according to C5 a) or C5 e) operated until stable conditions are achieved		N
	Automatic-resetting thermal protectors working 3 times		N
	Ballasts according to C5 b) working 6 times		N
	Ballasts 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
D	**ANNEX D – REQUIREMENTS FOR CARRY OUT THE HEATING TESTS OF THERMALLY PROTECTED LAMP CONTROLGEAR**		N
	Tests in C7 performed in accordance with Annex D, if applicable		N
E	**ANNEX E – USE OF CONSTANT S OTHER THAN 4500 IN t_w TESTS**		N
	Comply with tests according Annex E		N
F	**ANNEX F - DRAUGHT-PROOF ENCLOSURE**		N
	Draught-proof enclosure in accordance with the description		N
	Dimensions of the enclosure		N
	Other design; description		N

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Clause	Requirement + Test	Result - Remark	Verdict
H	**ANNEX H - TESTS**		P
	All tests performed in accordance with the advice given in Annex H, if applicable		P
I	**ANNEX I: PARTICULAR ADDITIONAL REQUIREMENTS FOR INDEPENDENT SELV D.C. OR A.C. SUPPLIED ELECTRONIC CONTROLGEAR FOR LED MODULES**		N
I.3	**Classification**		N
I.3.1	Class I	Yes ☐ No ☐	—
	Class II	Yes ☐ No ☐	—
I.3.2	a) non-inherently short circuit proof controlgear	Yes ☐ No ☐	—
	b) non-inherently open circuit proof controlgear	Yes ☐ No ☐	—
	c) inherently short circuit proof controlgear	Yes ☐ No ☐	—
	d) inherently open circuit proof controlgear	Yes ☐ No ☐	—
	e) fail safe controlgear	Yes ☐ No ☐	—
	f) non-short-circuit proof controlgear	Yes ☐ No ☐	—
	g) non-open-circuit proof controlgear	Yes ☐ No ☐	—
I.4	**Marking**		N
	Adequate symbols are used		N
I.5	**Protection against electric shock**		N
I.5.1	No connection between output winding and body		N
	No connection between output winding and protective earthing circuit		N
I.5.2	Input and output circuits electrically separated from each other		N
I.5.2.1	Insulation between input and output winding of the HF-transformer consists of double or reinforced insulation		N
	Class II: insulation between input/output and body consists of double or reinforced insulation		N
	Class I: insulation between input and body consists of basic and between output and body supplementary insulation		N
I.5.2.2	Insulation between input and output winding via the core consists of double or reinforced insulation		N
	Insulation between cord and windings of the HD-transformer consists of basic insulation		N
I.5.2.3	Serrated tape, additional layer		N
I.5.2.4	Class I controlgear for fixed connection provided with basic insulation plus protective screening comply with the following conditions:		N
	a) Insulation between the input winding and the protective screen complies with the requirements for basic insulation		N
	b) Insulation between the protective screen and the output winding complies with the requirements for basic insulation		N

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Clause	Requirement + Test	Result - Remark	Verdict
	c)Metal screen consists of a metal foil or of a wire		N
	d) Metal screen so arranged that both edges cannot simultaneously touch a magnetic core		N
	e) Metal screen and its lead-out wire have a cross-section sufficient to ensure that an overload device will open the circuit before the screen is destroyed		N
	f) Lead-out wire sufficiently fixed to the metal screen		N
I.5.2.5	Last turn of each winding of the transformer retained by positive means		N
	Impregnated winding		N
	Winding held together by means of insulating material		N
I.5.3	Components bridging between input and output circuit		N
I.5.3.1	Used capacitors and resistors comply with 8.2		N
I.5.3.2	Used opto-couplers comply with 2.10.5.2 of IEC 60950-1 or 0,4 mm and test in I.8		N
I.6	**Heating**		N
I.6.1	No excessive temperatures in normal use		N
	Used material classified as Class .....:		—
	Stated value of t_a .....:		—
I.6.2	Temperature rises (Upri: 1.06 time supply rated voltage)		N
	Determined temperature rises in windings: - Primary (K) .....: - Limit max (K) .....: - Secondary (K) .....: - Limit max (K) .....:		N
	After the test:		N
	- no connections have worked loose		N
	- no reduction of creepage distances and clearances		N
	- no flow of sealing compound		N
	- no operation of protecting devices		N
	- electric strength test between input and output windings		N
I.6.3	Cycling test (10 cycles):		N
I.6.3.1	- heat run at (K) .....:		N
I.6.3.2	- moisture treatment 48 h		N
I.6.3.3	- vibration test 1 h; 1,5 g		N
I.6.3.4	After the tests:		N
	- insulation resistance ≥ 2, 4 or 5 MΩ		N
	- dielectric strength test for 2 min. at 35 % of specified value in table I.6		N
	- Current or the ohmic component does not deviates by more than 30 %		N
I.7	**Short-circuit and overload protection**		N
I.7.1	Upri: 1.06 times rated voltage or 0.94 and 1.06 times rated supply voltage (V) .....:		N

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Clause	Requirement + Test	Result - Remark	Verdict
I.7.2 I.7.3 I.7.4	Determined temperature rise in windings and on other parts:		N
	- test according to Clause ..... :		N
	- Primary winding (K) ..... :		N
	- Limit max (K) ..... :		N
	- Secondary winding (K) ..... :		N
	- Limit max (K) ..... :		N
	- External enclosure ≤ 80 (K) ..... :		N
	- Rubber insulation of wiring ≤ 60 (K) ..... :		N
	- PVC insulation of wiring ≤ 60 (K) ..... :		N
	- Supports ≤ 80 (K) ..... :		N
I.7.5	Fail-safe convertors		N
I.7.5.1	- Upri: 1.06 times rated supply voltage.....V:		—
	- Isec: 1.5 times rated output current .....A:		—
	- time until steady-state conditions t1 (h) ..... :		—
	- time until failure t2 (h): ≤ t1; ≤ 5 h..... :		N
I.7.5.2	During the test:		N
	- no flames, molten material, etc.		N
	- temperature rise of enclosure ≤ 150 K		N
	- temperature rise of plywood support ≤ 100 K		N
	After the test:		N
	- electric strength (test voltage; 35 % of specified value); no flashover or breakdown for primary-to-secondary and for primary-to-body		N
	- live parts not accessible by test finger through holes of enclosure		N
I.8	**Insulation resistance and electric strength**		N
I.8.1	Conditioned 48 h between 91 % and 95 %		N
I.8.2	Adequate insulation (500 V d.c. for 1 min) between:		N
	Live parts and the body -for basic insulation not less than 2 MΩ ..... :		N
	Live parts and the body -for reinforced insulation not less than 4 MΩ ..... :		N
	Input- and output circuits not less than 5 MΩ ..... :		N
	Metal parts of class II convertors which are separated from live parts by basic insulation only and the body not less than 5 MΩ ..... :		N
	Metal foil in contact with the inner and outer surfaces of enclosures of insulating material not less than 2 MΩ ..... :		N
I.8.3	Electric strength test:		N
	1) Between live parts of input circuits and live parts of output circuits ..... :		N
	2) Over basic or supplementary insulation between:		N
	a) live parts which are or may become of different polarity ..... :		N
	b) live parts and body if intended to be connected to protective earth ..... :		N

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Clause	Requirement + Test	Result - Remark	Verdict
	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
	3) Over reinforced insulation between the body and live parts .....:		N
	No flashover or breakdown occurred		N
I.9	**Construction**		**N**
I.9.1	Comply with all requirements		N
I.9.2	The distance between input and output terminals shall not be less than 25 mm .....:		N
I.10	**Components**		N
I.10.1	Socket-outlets in the output circuit does not accept plugs complying with IEC 60083 and IEC 60906-1		N
I.10.2	Self-resetting protective devices shall not be used unless it is certain that there will be no hazards		N
	Compliance is checked by connecting the convertor for 48 h at 1.06 times the rated voltage with the output short-circuited		N
I.11	**Creepage distances and clearances**		**N**
	1. Insulation between input and output circuits:		N
	a) measured values ≥ specified values (mm) ..... :		N
	b) measured values ≥ specified values (mm) ..... :		N
	c) measured values ≥ specified values (mm) ..... :		N
	2. Insulation between adjacent input circuits: measured values ≥ specified values (mm) .....:		N
	2. Insulation between adjacent output circuits: measured values ≥ specified values (mm) .....:		N
	3. Insulation between terminals for external connection:		N
	a) measured values ≥ specified values (mm) ..... :		N
	b) measured values ≥ specified values (mm) ..... :		N
	c) measured values ≥ specified values (mm) ..... :		N
	4. Basic or supplementary insulation:		N
	a) measured values ≥ specified values (mm) ..... :		N
	b) measured values ≥ specified values (mm) ..... :		N
	c) measured values ≥ specified values (mm) ..... :		N
	d) measured values ≥ specified values (mm) ..... :		N
	e) measured values ≥ specified values (mm) ..... :		N
	5. Reinforced insulation: measured values ≥ specified values (mm) .....:		N
	6. Distance through insulation:		N
	a) measured values ≥ specified values (mm) ..... :		N
	b) measured values ≥ specified values (mm)..... :		N
	c) measured values ≥ specified values (mm)..... :		N
	d) measured values ≥ specified values (mm)..... :		N

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Clause	Requirement + Test	Result - Remark	Verdict

L	**ANNEX L: PARTICULAR ADDITIONAL REQUIREMENTS FOR CONTROLGEARS PROVIDING SELV** (IEC 61347-1)		N
L.3	**Classification**		**N**
	Class I	Yes ☐ No ☐	—
	Class II	Yes ☐ No ☐	—
	Class III	Yes ☐ No ☐	—
	non-inherently short circuit proof controlgear	Yes ☐ No ☐	—
	inherently short circuit proof controlgear	Yes ☐ No ☐	—
	fail safe controlgear	Yes ☐ No ☐	—
	non-short-circuit proof controlgear	Yes ☐ No ☐	—
L.4	**Marking**		**N**
	Adequate symbols are used		N
L.5	**Protection against electric shock**		**N**
	Comply with 9.2 of IEC 61558-1		N
L.6	**Heating**		**N**
	No excessive temperatures in normal use		N
	Value if capacitor t_c marked ..... :		—
	Winding insulation classified as Class ..... :		—
	Comply with tests of clause 14 of IEC 61558-1 with adjustments		N
L.7	**Short-circuit and overload protection**		**N**
	Comply with tests of clause 15 of IEC 61558-1 with adjustments		N
L.8	**Insulation resistance and electric strength**		**N**
L.8.1	Conditioned 48 h between 91 % and 95 %		N
L.8.2	Insulation resistance		N
	Between input- and output circuits not less than 5 MΩ ..... :		N
	Between metal parts of class II convertors which are separated from live parts by basic insulation only and the body not less than 5 MΩ ..... :		N
	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		N
	1) Between live parts of input circuits and live parts of output circuits ..... :		N
	2) Over basic or supplementary insulation between:		N
	a) live parts having different polarity ..... :		N

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Clause	Requirement + Test	Result - Remark	Verdict
	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**		**N**
L.9.1	Transformer comply with 19.12 of IEC 61558-1 and 19 of IEC 61558-2-6		N
	HF transformer comply with 19 of IEC 61558-2-16		N
L.10	**Components**		**N**
	Protective devices comply with 20.6 – 20.11 of IEC 61558-1		N
L.11	**Creepage distances and clearances**		**N**
	1. Insulation between input and output circuits, basic insulation:		N
	a) measured values ≥ specified values (mm) .....:		N
	b) measured values ≥ specified values (mm) .....:		N
	c) measured values ≥ specified values (mm) .....:		N
	2. Insulation between input and output circuits, double or reinforced insulation:		N
	a) measured values ≥ specified values (mm) .....:		N
	b) measured values ≥ specified values (mm) .....:		N
	c) measured values ≥ specified values (mm) .....:		N
	3. Insulation between adjacent input circuits		N
	- measured values ≥ specified values (mm) .....:		N
	3. Insulation between adjacent output circuits		N
	- measured values ≥ specified values (mm) .....:		N
	4. Insulation between terminals for external connection:		N
	- measured values ≥ specified values (mm) .....:		N
	5. Basic or supplementary insulation:		N
	a) measured values ≥ specified values (mm) .....:		N
	b) measured values ≥ specified values (mm) .....:		N
	c) measured values ≥ specified values (mm) .....:		N
	d) measured values ≥ specified values (mm) .....:		N
	e) measured values ≥ specified values (mm) .....:		N
	6. Reinforced insulation or insulation:		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Between body and output circuit: measured values ≥ specified values (mm) .....:		N
	Between body and output circuit if provision against transient voltages: measured values ≥ specified values (mm) .....:		N
	7. Distance through insulation:		N
	a) measured values ≥ specified values (mm) .....:		N
	b) measured values ≥ specified values (mm) .....:		N
	c) measured values ≥ specified values (mm) .....:		N
N	**ANNEX N: REQUIREMENTS FOR INSULATION MATERIALS USED FOR DOUBLE OR REINFORCED INSULATION** (IEC 61347-1)		N
N.4	**General requirements**		**N**
N.4.1	Material comply with IEC 60085 and IEC 60216 series		N
N.4.2	Solid insulation		N
	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		N
N.4.3.1	Thickness and composition of thin sheet insulation		N
	- Inside the ballast and not subjected to handling or abrasion during the production and during maintenance		N
	- Non-separated layers: Min. 3 layers and fulfil mandrel test of 150N		N
	- 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)		N
	Electric strength test after mandrel test:		N
	- Non-separated layers: min. 5 kV or 1,35 x test voltage in Table N.1		N
	- 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

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Clause	Requirement + Test	Result - Remark	Verdict
O	**ANNEX O: ADDITIONAL REQUIREMENTS FOR BUILT-IN ELECTRONIC CONTROLGEAR WITH DOUBLE OR REINFORCED INSULATION** (IEC 61347-1)		N
O.6	**Marking**		**N**
	Marking according clause 7 (7)	See clause 7	N
	Special symbol		N
	Meaning of the special symbol explained in catalogue		N
O.7	**Protection against accidental contact with live parts**		**N**
	Requirements of clause 8 (10)	See clause 8	N
	Test finger not possible to make contact with basic insulated metal parts		N
O.8	**Terminals**		**N**
	Clause 9 (8)	See clause 9	N
O.9	**Provision for earthing**		**N**
	Functional earthing terminals comply with clause 9 of part 1		N
	No protective earthing terminal		N
O.10	**Moisture resistance and insulation**		**N**
	Clause 11 (11)	See clause 11	N
O.11	**Electric strength**		**N**
	Clause 12 (12)	See clause 12	N
O.13	**Fault conditions**		**N**
	Clause 14 (14)	See clause 14	N
	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
	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
O.14	**Construction**		**N**
	Clause 17 (15)	See clause 17	N
	Accessible metal parts insulated from live parts by double or reinforced insulation		N
	Live part insulated from supporting surface in contact with external faces by double or reinforced insulation		N
O.15	**Creepage distances and clearances**		**N**
	Clause 18 (16)	See clause 18	N

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Clause	Requirement + Test	Result - Remark	Verdict
	Comply with corresponding values for luminaries in IEC 60598-1		N
O.16	**Screws, current-carrying parts and connections**		**N**
	Clause 19 (17)	See clause 19	N
O.17	**Resistance to heat and fire**		**N**
	Clause 20 (18)	See clause 20	N
O.18	**Resistance to corrosion**		**N**
	Clause 21 (19)	See clause 21	N

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Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 1: components					P
object/part No.	code	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity
Terminals	B	Degson Electronics Co. Ltd.	DG236	400V, 0,2…1,5mm ^{2} , T110	IEC/EN 60998-2-1 IEC/EN 60998-1	VDE 40028279
Input wire of LED driver (internal)	B,C	DONG GUAN SHENG PAI ELECTRIC WIRE & CABLE CO LTD	3266	18AWG, 125°C, VW-1	--	UL E347603
Output wire of LED driver (internal)	B,C	DONG GUAN SHENG PAI ELECTRIC WIRE & CABLE CO LTD	3266	18AWG, 125°C, VW-1	--	UL E347603
Internal wire	B,C	YUYAO JINGYI ELECTRONICS CO LTD	SJOW	18AWG, 105°C	--	UL E231324
PCB for fixed terminals	B,C	SHENZHEN LIANCHUANG ELECTRONICS CO LTD	LC-2	V-0, 130°C	--	UL E318531
Alternative	D	GOLEDEMAX INTERNATIONAL TECHNOLOGY (ZHUHUA) LTD	GF432	V-0, 130°C	--	UL E330731
PCB	B,C	SHENZHEN LIANCHUANG ELECTRONICS CO LTD	LC-2	V-0, 130°C	--	UL E318531
Alternative	D	GOLEDEMAX INTERNATIONAL TECHNOLOGY (ZHUHUA) LTD	GF432	V-0, 130°C	--	UL E330731
Fuse(F1)	B	Littelfuse Phils. Inc.	369	T3,15A, 250VAC	IEC/EN 60127-1 IEC/EN 60127-3	VDE 40037351
Alternative	D	Dongguan Better Electronics Technology Co., Ltd	932	T3,15A, 250VAC	IEC/EN 60127-1 IEC/EN 60127-3	VDE 40033369

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Clause	Requirement + Test	Result - Remark	Verdict

Fuse(F2)	B	Littelfuse Phils. Inc.	369	T1,0A, 250VAC	IEC/EN 60127-1 IEC/EN 60127-3	VDE 40037351
Alternative	D	Dongguan Better Electronics Technology Co., Ltd	932	T1,0A, 250VAC	IEC/EN 60127-1 IEC/EN 60127-3	VDE 40033369
Varistor	B	Thinking Electonic Industrial Co., Ltd.	TVR10561	560V, 85°C	IEC/EN 61051-1 IEC/EN 61051-2 IEC/EN 61051-2-2	VDE 005944
Alternative	D	Brightking (Shenzhen) Co., Ltd.	10D561K	560V, 85°C	IEC/EN 61051-1 IEC/EN 61051-2 IEC/EN 61051-2-2	VDE 40027827
Y-capacitor (CY2,CY3,CY4)	B	JYH HSU ELECTRONICS LTD.	JD	1000pF, 400V, 125°C	IEC/EN 60384-14	VDE 40038642
Y-capacitor (CY1)	B	JYH HSU ELECTRONICS LTD.	JD	2200pF, 400V, 125°C	IEC/EN 60384-14	VDE 40038642
Y-capacitor (CY5)	B	JYH HSU ELECTRONICS LTD.	JY	0,01µF, 300V, 125°C	IEC/EN 60384-14	VDE 40038643
Optocoupler	B	Everlight Electronics Co., Ltd.	EL817	AC 250V, dti=0,4mm, 110°C	IEC/EN 60747-5-5	VDE 132249
X-Capacitor (CX1)	B	Winday Electronic Industrial Co., Ltd.	MPX series	0,33µF, 310V, 40/110/56	IEC/EN 60384-14	VDE 40030283
NTC	B	Uppermost Electronic Industries Co., Ltd.	N15SP1R5	1,3Ohm-120Ohm, 4W, -40/150/21	EN/IEC 60539-1	VDE 40013917 UL E133510
Magnet wire of L1.LF1,LF2	B,C	TONGLING NONFERROUS COPPER CROWN ELECTRICAL CO LTD	2UEW	155°C	--	UL E217937

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Clause	Requirement + Test	Result - Remark	Verdict

Magnet wire of L2	B,C	TONGLING NONFERROUS COPPER CROWN ELECTRICAL CO LTD	2UEW	155°C	--	UL E217937
Bobbin of L2	B,C	CHANGCHUN PLASTICS CO., LTD	T375J	130°C	--	UL E59481
Magnet wire of T1	B,C	TONGLING NONFERROUS COPPER CROWN ELECTRICAL CO LTD	UEW	155°C	--	UL E217937
Insulated Winding Wire of T1	B	Shanghai Xiangxiang Electron Co., Ltd	TKW-B	130°C	IEC/EN 60950-1	VDE 40026588
Bobbin of T1	B,C	CHANGCHUN PLASTICS CO., LTD	T375J	130°C	--	UL E59481
Tube of T1	B,C	SHENZHEN WOER HEAT-SHRINKABLE MATERIAL CO LTD	WF	200°C	--	UL E203950
Tape of T1	B,C	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD	PZ* (b)	130°C	--	UL E165111
Potting compound	B,C	DONGGUAN ZHAOSHUN SILICONE NEW MATERIAL TECHNOLOGY CO LTD	ZS-GF	V-0, 150°C	--	UL E329120
Plastic for fixed LED driver	B,C	SHENZHEN TIANYUAN TECHNOLOGY CO LTD	Tc-Pad TS-60XX	V-0, 150°C	--	UL E470057
White Silicone	B,C	SHENZHEN SHENGKANGTAI SILICONE MATERIAL CO LTD	TF-580	V-0	--	UL E341043

The codes above have the following meaning:
A - The component is replaceable with another one, also certified, with equivalent characteristics
B - The component is replaceable if authorised by the test house
C - Integrated component tested together with the appliance
D - Alternative component

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Clause	Requirement + Test	Result - Remark	Verdict
	ANNEX 2: screw terminals (part of the luminaire)		N
(14)	**SCREW TERMINALS**		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 (mm²).....		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)..	M	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

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Clause	Requirement + Test	Result - Remark	Verdict
	ANNEX 3: screwless terminals (part of the luminaire)		N
(15)	**SCREWLESS TERMINALS**		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
(15.6)	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
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples)..... :		N
(15.7)	Terminals external wiring		N

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Clause	Requirement + Test	Result - Remark	Verdict

	Terminal size and rating										N
(15.8.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....:										N
	Pull test pin or tab terminals (4 samples); pull (N) .....:										N
(15.9)	Contact resistance test										N
	Voltage drop (mV) after 1 h										
terminal		1	2	3	4	5	6	7	8	9	10
voltage drop (mV)											
	Voltage drop of two inseparable joints										
	Voltage drop after 10th alt. 25th cycle										
	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										
	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										
	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										
	Max. allowed voltage drop (mV).....:										—
terminal		1	2	3	4	5	6	7	8	9	10
voltage drop (mV)											

Photo 1 Overview

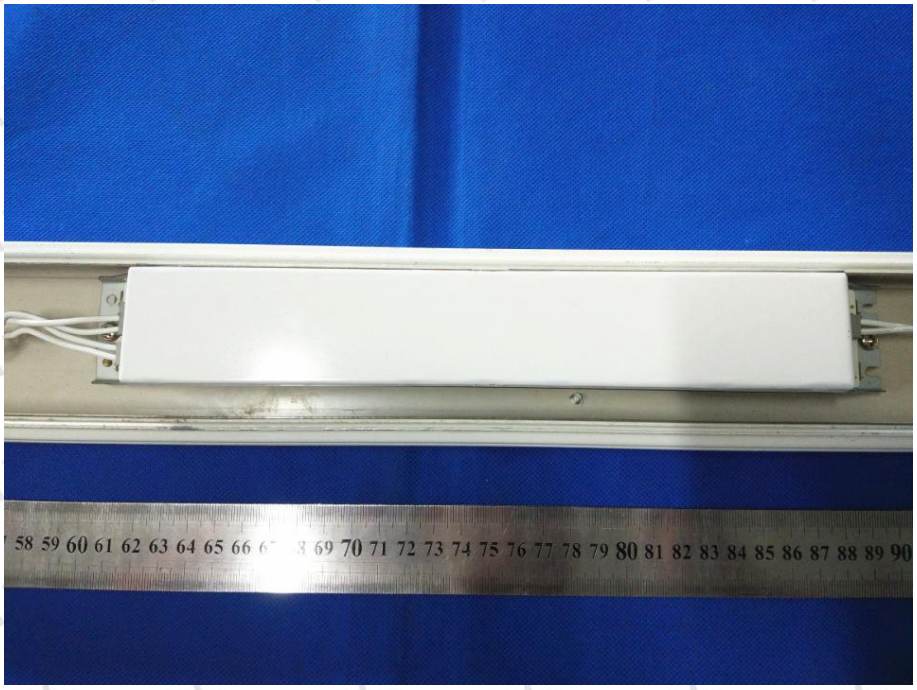

Photo 2 Inside View

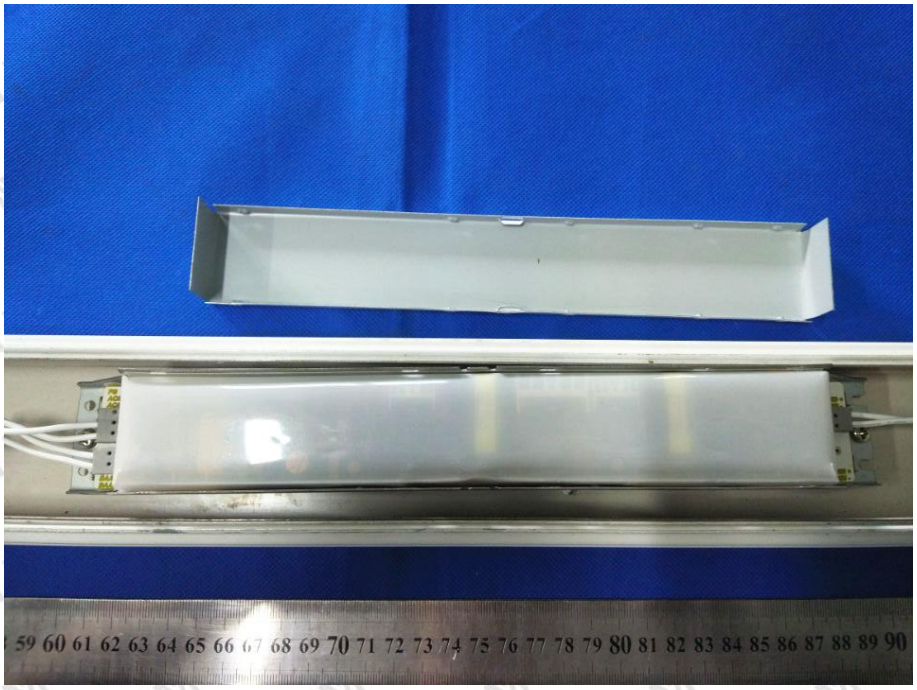

Photo 3 PCB Top View

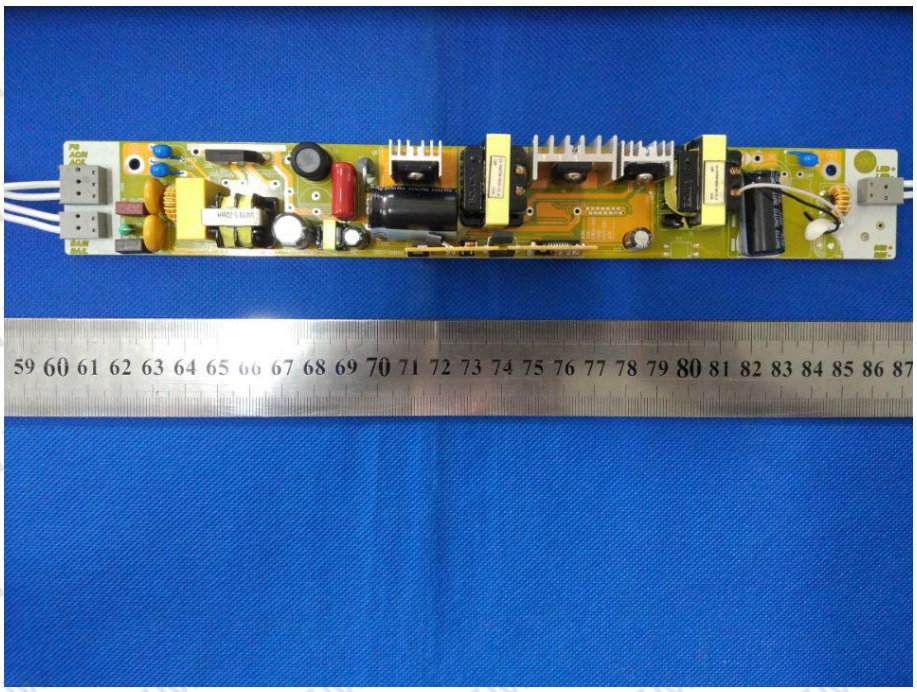

Photo 4 PCB Bottom View