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

Report Number.....:	LCS190910041BS
Date of issue.....:	December 20, 2019
Total number of pages.....:	72 pages
Name of Testing Laboratory preparing the Report.....:	**Shenzhen Southern LCS Compliance Testing Laboratory Ltd.**
Applicant's name.....:	**Fulton Science And Technology Lighting Co., Ltd**
Address.....:	7F, Building 17, Area C, Liantang Industrial Town, Shangcun Community, Gongming Town, Guangming New District, Shenzhen, Guangdong Province, China
Test specification:	
Standard.....:	IEC 60598-2-1:1979 (First Edition) + A1:1987 used in conjunction with IEC 60598-1:2014+A1:2017
Test procedure.....:	CE-LVD
Non-standard test method.....:	N/A
Test Report Form No.....:	IEC60598_2_1F
Test Report Form(s) Originator.....:	Intertek Semko AB
Master TRF.....:	2017-10

General disclaimer:

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

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Test item description.....:	LED TRI-PROOF LIGHT
Trade Mark.....:	Fulton
Manufacturer.....:	Fulton Science And Technology Lighting Co., Ltd
Address.....:	7F, Building 17, Area C, Liantang Industrial Town, Shangcun Community, Gongming Town, Guangming New District, Shenzhen, Guangdong Province, China
Model/Type reference.....:	See model list on page 5
Ratings.....:	220-240V~, 50/60Hz, ta45°C, IP65, detail see model list on page 5

☒ **Testing Laboratory:**		
Testing location/ address.....:	Shenzhen Southern LCS Compliance Testing Laboratory Ltd. 101-201, No.39 Building, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, China	
Tested by.....:	Alyson Zhang (Engineer)	Alyson Zhang
Check by.....:	Lisa Zeng (Director)	Lisa Zeng
Approved by.....:	Jesse Liu (Manager)	Jesse Liu

List of Attachments (including a total number of pages in each attachment):

Attachment No. 1: 2 pages of European group differences and national differences according to EN 60598-2-1:1989 used in conjunction with EN 60598-1:2015+A1:2018

Attachment No. 2: 1 pages of report IEC/EN 62031.

Attachment No. 3: 3 pages of report IEC/EN 62471.

Attachment No. 4: 20 pages of report IEC/EN 61347-2-13.

Attachment No. 5: 8 pages of photo documentation.

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
IEC 60598-2-1:1979+A1:1987 IEC 60598-1:2014+A1:2017 IEC 62471:2006 IEC TR 62778:2014 IEC 62031:2008+A1:2012+A2:2014 IEC 61347-2-13:2014+A1:2016 IEC 61347-1:2015+A1:2017	Shenzhen Southern LCS Compliance Testing Laboratory Ltd. 101-201, No.39 Building, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, China

Summary of compliance with National Differences:

List of countries addressed

☐ The product fulfils the requirements of Germany and European Group differences

EN 60598-2-1:1989; EN 60598-1:2015+A1:2018; EN 62471:2008; EN 62493:2015;

EN 62031:2008+A1:2013+A2:2015; EN 61347-1:2015; EN 61347-2-13:2014+A1:2017

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Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Fulton

LED TRI-PROOF LIGHT
Model: FLT-TPT-40L15
220-240V~, 50/60Hz, 40W

IP65 ta45°C

Fulton Science And Technology Lighting Co., Ltd
Importer: xxxxxxxx
Address: xxxxxxxx

MADE IN CHINA

 : “caution, electric shock risk” symbol, height of this marks least 15mm.

Remarks:

1. Representative markings of FLT-TPT-40L15, markings of all models are identical except for the model name and rating.

2. Height of CE mark at least 5mm, height of WEEE symbol should not less than 7mm, height of other marks at least 5mm, height of letters and numerals at least 2mm.

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Test item particulars..... :	
Classification of installation and use.....:	Fixed general purpose luminaires
Supply Connection.....:	Terminal block
Protection Class.....:	Class I
Degree of Protection.....:	IP65
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.....:	November 01, 2019
Date (s) of performance of tests.....:	November 01, 2019 - November 13, 2019

General remarks:

This 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 Enclosure #)" refers to additional information appended to the report.
Clause numbers with "*" were not within the scope of CNAS recognition.
Clause numbers between brackets refer to clauses in IEC/EN 60598-1.

Throughout this report a ☒ comma / ☐ point 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.

Modified Information

Version	Report No.	Revision Date	Summary
V1.0	LCS190910041BS	/	Original Version

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided..... :	☐ **Yes** ☒ **Not applicable**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies).....:	Same as manufacturer

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General product information:

- All models have similar construction except for the power and size.
- Unless otherwise specified, the model FLT-TPT-40L15 was chosen as representative model to perform all test.

Model List:

Model	Rating
FLT-TPT-10L6	220-240V~, 50/60Hz, 10W, IP65, ta45°C
FLT-TPT-15L6	220-240V~, 50/60Hz, 15W, IP65, ta45°C
FLT-TPT-20L6	220-240V~, 50/60Hz, 20W, IP65, ta45°C
FLT-TPT-20L12	220-240V~, 50/60Hz, 20W, IP65, ta45°C
FLT-TPT-30L12	220-240V~, 50/60Hz, 30W, IP65, ta45°C
FLT-TPT-40L12	220-240V~, 50/60Hz, 40W, IP65, ta45°C
FLT-TPT-30L15	220-240V~, 50/60Hz, 30W, IP65, ta45°C
FLT-TPT-40L15	220-240V~, 50/60Hz, 40W, IP65, ta45°C

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.2 (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 ☒	—
1.2 (0.5)	Components	(see Annex 1)	—
1.2 (0.7)	Information for luminaire design in light sources standards		—
1.2 (0.7.2)	Light source safety standard ..... :		—
	Luminaire design in the light source safety standard		P
1.4 (2)	**CLASSIFICATION**		P
1.4 (2.2)	Type of protection ..... :	Class I	—
1.4 (2.3)	Degree of protection..... :	IP65	—
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/A
1.5 (3.3.2)	Nominal frequency in Hz	50/60Hz	P
1.5 (3.3.3)	Operating temperature		N/A
1.5 (3.3.5)	Wiring diagram		N/A
1.5 (3.3.6)	Special conditions		N/A
1.5 (3.3.7)	Metal halide lamp luminaire – warning		N/A
1.5 (3.3.8)	Limitation for semi-luminaires		N/A
1.5 (3.3.9)	Power factor and supply current		P
1.5 (3.3.10)	Suitability for use indoors	IP65 suitability for use indoors and outdoors	P
1.5 (3.3.11)	Luminaires with remote control		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
1.5 (3.3.12)	Clip-mounted luminaire – warning		N/A
1.5 (3.3.13)	Specifications of protective shields		N/A
1.5 (3.3.14)	Symbol for nature of supply	~	P
1.5 (3.3.15)	Rated current of socket outlet		N/A
1.5 (3.3.16)	Rough service luminaire		N/A
1.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments		N/A
1.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A
1.5 (3.3.19)	Protective conductor current in instruction if applicable		N/A
1.5 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
1.5 (3.3.21)	Non-replaceable and non-user replaceable light sources information provided	Non-user replaceable	P
1.5 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
1.5 (3.3.23)	Luminaire without controlgear provided with necessary information for selection of appropriate component		N/A
1.5 (3.3.24)	If not supplied with terminal block, information on the packaging		N/A
1.5 (3.4)	Test with water	15s	P
	Test with hexane	15s	P
	Legible after test		P
	Label attached		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/A
1.6 (4.4.1)	Integral lampholder		N/A
1.6 (4.4.2)	Wiring connection		N/A
1.6 (4.4.3)	Lampholder for end-to-end mounting		N/A
*1.6 (4.4.4)	Positioning		N/A
	- pressure test (N) ..... :		—
	After test the lampholder comply with relevant standard sheets and show no damage		N/A

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation		N/A
	- bending test (N) .....:		—
	After test the lampholder have not moved from its position and show no permanent deformation		N/A
1.6 (4.4.5)	Peak pulse voltage		N/A
1.6 (4.4.6)	Centre contact		N/A
1.6 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A
1.6 (4.4.8)	Lamp connectors		N/A
1.6 (4.4.9)	Caps and bases correctly used		N/A
1.6 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N/A
1.6 (4.5)	**Starter holders**		N/A
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
1.6 (4.6)	**Terminal blocks**		**P**
	Tails		N/A
	Unsecured blocks		P
1.6 (4.7)	**Terminals and supply connections**		**P**
1.6 (4.7.1)	Contact to metal parts		P
1.6 (4.7.2)	Test 8 mm live conductor		P
	Test 8 mm earth conductor		P
1.6 (4.7.3)	Terminals for supply conductors		P
1.6 (4.7.3.1)	Welded method and material		N/A
	- stranded or solid conductor		N/A
	- spot welding		N/A
	- welding between wires		N/A
	- Type Z attachment		N/A
	- mechanical test according to 15.8.2		N/A
	- electrical test according to 15.9		N/A
	- heat test according to 15.9.2.3 and 15.9.2.4		N/A
1.6 (4.7.4)	Terminals other than supply connection		N/A
1.6 (4.7.5)	Heat-resistant wiring/sleeves		N/A
1.6 (4.7.6)	Multi-pole plug		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- test at 30 N		N/A
1.6 (4.8)	**Switches**		N/A
	- adequate rating		N/A
	- adequate fixing		N/A
	- polarized supply		N/A
	- compliance with IEC 61058-1 for electronic switches		N/A
1.6 (4.9)	**Insulating lining and sleeves**		**N/A**
1.6 (4.9.1)	Retainment		N/A
	Method of fixing.....:		—
1.6 (4.9.2)	Insulated linings and sleeves:		N/A
	Resistant to a temperature > 20 °C to the wire temperature or		N/A
	a) & c) Insulation resistance and electric strength		N/A
	b) Ageing test. Temperature (°C).....:		N/A
1.6 (4.10)	**Double or reinforced insulation**		N/A
1.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		N/A
	Safe installation fixed luminaires		N/A
	Capacitors and switches		N/A
	Interference suppression capacitors according to IEC 60384-14		N/A
1.6 (4.10.2)	Assembly gaps:		N/A
	- not coincidental		N/A
	- no straight access with test probe		N/A
1.6 (4.10.3)	Retainment of insulation:		N/A
	- fixed		N/A
	- unable to be replaced; luminaire inoperative		N/A
	- sleeves retained in position		N/A
	- lining in lampholder		N/A
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/A
	- self-tapping screws		N/A
	- thread- cutting screws		N/A

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.11.3)	Screw locking:		P
	- spring washer		P
	- rivets		N/A
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/A
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/A
	Torque test: torque (Nm); part.....:	Fixed enclosure: 0,6Nm	P
	Torque test: torque (Nm); part.....:	Fixed Driver PCB: 0,6Nm	P
	Torque test: torque (Nm); part.....:	Fixed earthing: 0,6Nm	P
	Torque test: torque (Nm); part.....:	Fixed cord anchorage: 0,6Nm	P
1.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
*1.6 (4.12.4)	Locked connections:		N/A
	- fixed arms; torque (Nm)..... :		N/A
	- lampholder; torque (Nm).....:		N/A
	- push-button switches; torque 0,8 Nm..... :		N/A
1.6 (4.12.5)	Screwed glands; force (Nm)..... :	Plastic gland: 3,25Nm	P
1.6 (4.13)	**Mechanical strength**		**P**
1.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm)..... :		N/A
	- other parts; energy (Nm)..... :	0,35Nm, no damage	P
	1) live parts		P
	2) linings		N/A
	3) protection		P
	4) covers		P
1.6 (4.13.3)	Straight test finger		P
1.6 (4.13.4)	Rough service luminaires		N/A
	- IP54 or higher		N/A
	a) fixed		N/A
	b) hand-held		N/A
	c) delivered with a stand		N/A

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	d) for temporary installations and suitable for mounting on a stand		N/A
1.6 (4.13.6)	Tumbling barrel		N/A
1.6 (4.14)	**Suspensions, fixings and means of adjusting**		**P**
1.6 (4.14.1)	Mechanical load:		P
	A) four times the weight		P
	B) torque 2,5 Nm		N/A
	C) bracket arm; bending moment (Nm)..... :		N/A
	D) load track- mounted luminaires		N/A
	E) clip-mounted luminaires, glass-shelve. Thickness (mm) ..... :		N/A
	Metal rod. diameter (mm) .....:		N/A
	Fixed luminaire or independent control gear without fixing devices		N/A
1.6 (4.14.2)	Load to flexible cables		N/A
	Mass (kg) ..... :		—
	Stress in conductors (N/mm²) .....:		N/A
	Mass (kg) of semi-luminaire .....:		—
	Bending moment (Nm) of semi-luminaire .....:		N/A
1.6 (4.14.3)	Adjusting devices:		N/A
	- flexing test; number of cycles..... :		N/A
	- strands broken..... :		N/A
	- electric strength test afterwards		N/A
1.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
1.6 (4.14.5)	Guide pulleys		N/A
1.6 (4.14.6)	Strain on socket-outlets		N/A
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/A
	- screen withstanding test of 13.3.1		N/A
	- screen dimensions		N/A
	- no fiercely burning material		P
	- thermal protection		N/A
	- electronic circuits exempted		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		N/A
	a) construction		N/A
	b) temperature sensing control		N/A
	c) surface temperature		N/A
1.6 (4.16)	**Luminaires for mounting on normally flammable surfaces**		**P**
	No lamp control gear.....:	(compliance with Section 12)	N/A
	Provided with adaptor for a track meet the requirements for direct mounting on normally flammable surfaces		N/A
1.6 (4.16.1)	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
1.6 (4.16.2)	Thermal protection:		N/A
	- in lamp control gear		N/A
	- external		N/A
	- fixed position		N/A
	- temperature marked lamp control gear		N/A
1.6 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N/A
1.6 (4.17)	**Drain holes**		N/A
	Clearance at least 5 mm		N/A
1.6 (4.18)	**Resistance to corrosion**		N/A
1.6 (4.18.1)	- rust- resistance		N/A
*1.6 (4.18.2)	- season cracking in copper		N/A
1.6 (4.18.3)	- corrosion of aluminium		N/A
1.6 (4.19)	Igniters compatible with ballast		N/A
*1.6 (4.20)	Rough service vibration		N/A
1.6 (4.21)	**Protective shield**		N/A
1.6 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A
	Shield of glass if tungsten halogen lamps		N/A
1.6 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
1.6 (4.21.3)	No direct path		N/A
1.6 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment.....:	See Test Table 1.15 (13.3.2)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.22)	Attachments to lamps not cause overheating or damage		N/A
1.6 (4.23)	Semi-luminaires comply Class II		N/A
1.6 (4.24)	**Photobiological hazards**		P
*1.6 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N/A
1.6 (4.24.2)	Retinal blue light hazard	Exempt: RG0	P
	Luminaires with E_{thr} :		N/A
	a) Fixed luminaires		N/A
	- distance x m, borderline between RG1 and RG2... :		N/A
	- marking and instruction according 3.2.23		N/A
	b) Portable and handheld luminaires		N/A
	- marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778		N/A
	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/A
1.6 (4.25)	**Mechanical hazard**		**P**
	No sharp point or edges		P
***1.6 (4.26)**	**Short-circuit protection**		N/A
*1.6 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N/A
*1.6 (4.26.2)	Short-circuit test with test chain according 4.26.3		N/A
	Test chain not melt through		N/A
	Test sample not exceed values of Table 12.1 and 12.2		N/A
1.6 (4.27)	**Terminal blocks with integrated screwless earthing contacts**		N/A
	Test according Annex V		N/A
	Pull test of terminal fixing (20 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Pull test of mechanical connection (50 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Voltage drop test, resistance < 0,05 Ω		N/A
1.6 (4.28)	**Fixing of thermal sensing control**		N/A
	Not plug-in or easily replaceable type		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Reliably kept in position		N/A
	No adhesive fixing if UV radiations from a lamp can degrade the fixing		N/A
	Not outside the luminaire enclosure		N/A
	Test of adhesive fixing:		N/A
	Max. temperature on adhesive material (°C)..... :		—
	100 cycles between t min and t max		N/A
	Temperature sensing control still in position		N/A
1.6 (4.29)	**Luminaires with non-replaceable light source**		N/A
	Not possible to replace light source		N/A
	Live part not accessible after parts have been opened by hand or tools		N/A
1.6 (4.30)	**Luminaires with non-user replaceable light source**		P
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		P
	Minimum two fixing means		P
1.6 (4.31)	**Insulation between circuits**		P
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3		P
	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/A
1.6 (4.31.1)	SELV circuits		N/A
	Used SELV source		N/A
	Voltage ≤ ELV		N/A
	Insulating of SELV circuits from LV supply		N/A
	Insulating of SELV circuits from other non SELV circuits		N/A
	Insulating of SELV circuits from FELV		N/A
	Insulating of SELV circuits from other SELV circuits		N/A
	SELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Plugs and socket-outlets does not have protective conductor contact		N/A
1.6 (4.31.2)	FELV circuits		N/A
	Used FELV source		N/A
	Voltage ≤ ELV		N/A
	Insulating of FELV circuits from LV supply		N/A
	FELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Socket-outlets does not have protective conductor contact		N/A
1.6 (4.31.3)	Other circuits		P
	Other circuits insulated from accessible parts according Table X.1		P
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		N/A
	- conductive parts are connected together		N/A
	- test according 7.2.3 of above		N/A
	- conductive part not cause an electric shock in case of an insulation fault		N/A
	- equipotential bonding in master/slave applications		N/A
	- master luminaire provided with terminal for accessible conductive parts of slave luminaires		N/A
	- slave luminaire constructed as class I		N/A
1.6 (4.32)	**Overvoltage protective devices**		N/A
	Comply with IEC 61643-11		N/A
	External to control gear and connected to earth:		N/A
	- only in fixed luminaires		N/A
	- only connected to protective earth		N/A

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).....:	AC 220-240V	—
	Rated pulse voltage (kV).....:		—

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Clause	Requirement + Test	Result - Remark	Verdict

	Voltage form.....:	Sinusoidal ☒ Non-sinusoidal ☐	—
	PTI.....:	< 600 ☒ ≥ 600 ☐	—
	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.....:	0,05Ω	P
	Self-tapping screws used		N/A
	Thread-forming screws		P
	Thread-forming screw used in a grove		N/A
	Earth makes contact first		P
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
	Protective earthing of the luminaire not via built-in control gear		P
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/A
1.8 (7.2.5)	Earth terminal integral part of connector socket		N/A
1.8 (7.2.6)	Earth terminal adjacent to mains terminals		P
1.8 (7.2.7)	Electrolytic corrosion of the earth terminal		P
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/A
	Double or reinforced insulation to functional earth		N/A
1.8 (7.2.11)	Earthing core coloured green-yellow		P
	Length of earth conductor		P

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.9 (14)	**SCREW TERMINALS**		N/A
	Separately approved; component list.....:	(see Annex 1)	N/A
	Part of the luminaire.....:	(see Annex 3)	N/A
1.9 (15)	**SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS**		N/A
	Separately approved; component list.....:	(see Annex 1)	N/A
	Part of the luminaire.....:	(see Annex 4)	N/A
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.....:	Terminal block	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/A
1.10 (5.2.2)	Type of cable.....:		N/A
	Nominal cross-sectional area (mm²)..... :		N/A
	Cables equal to IEC 60227 or IEC 60245		N/A
1.10 (5.2.3)	Type of attachment, X, Y or Z		N/A
1.10 (5.2.5)	Type Z not connected to screws		N/A
1.10 (5.2.6)	Cable entries:		N/A
	- suitable for introduction		N/A
	- adequate degree of protection		N/A
1.10 (5.2.7)	Cable entries through rigid material have rounded edges		N/A
1.10 (5.2.8)	Insulating bushings:		N/A
	- suitably fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- tubes or guards made of insulating material		N/A
1.10 (5.2.9)	Locking of screwed bushings		N/A
1.10 (5.2.10)	Cord anchorage:		N/A
	- covering protected from abrasion		N/A
	- clear how to be effective		N/A
	- no mechanical or thermal stress		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- no tying of cables into knots etc.		N/A
	- insulating material or lining		N/A
1.10 (5.2.10.1)	Cord anchorage for type X attachment:		N/A
	a) at least one part fixed		N/A
	b) types of cable		N/A
	c) no damaging of the cable		N/A
	d) whole cable can be mounted		N/A
	e) no touching of clamping screws		N/A
	f) metal screw not directly on cable		N/A
	g) replacement without special tool		N/A
	Glands not used as anchorage		N/A
	Labyrinth type anchorages		N/A
1.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		N/A
1.10 (5.2.10.3)	Tests:		N/A
	- impossible to push cable; unsafe		N/A
	- pull test: 25 times; pull (N)..... :		N/A
	- torque test: torque (Nm)..... :		N/A
	- displacement ≤ 2 mm		N/A
	- no movement of conductors		N/A
	- no damage of cable or cord		N/A
	- function independent of electrical connection		N/A
1.10 (5.2.11)	External wiring passing into luminaire		N/A
1.10 (5.2.12)	Looping-in terminals		N/A
1.10 (5.2.13)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		N/A
1.10 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
1.10 (5.2.16)	Appliance inlets (IEC 60320)		N/A
	Installation couplers (IEC 61535)		N/A
	Other appliance inlet or connector according relevant IEC standard		N/A
1.10 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
1.10 (5.2.18)	Used plug in accordance with		N/A
	- IEC 60083		N/A
	- other standard		N/A
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/A
	- factory assembled		P
	- socket outlet loaded (A)..... :		N/A
	- 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)..... :	1,5 mm²	P
	Insulation thickness		P
	Extra insulation added where necessary		N/A
1.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		N/A
	Adequate cross-sectional area and insulation thickness		N/A
1.10 (5.3.1.3)	Double or reinforced insulation for class II		P
1.10 (5.3.1.4)	Conductors without insulation		N/A
1.10 (5.3.1.5)	SELV current-carrying parts		N/A
1.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
1.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Joints, raising/lowering devices		N/A
	Telescopic tubes etc.		N/A
	No twisting over 360°		P
1.10 (5.3.3)	Insulating bushings:		N/A
	- suitable fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- cables with protective sheath		N/A
1.10 (5.3.4)	Joints and junctions effectively insulated		N/A
1.10 (5.3.5)	Strain on internal wiring		N/A
1.10 (5.3.6)	Wire carriers		N/A
1.10 (5.3.7)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		P
1.10 (5.4)	Test to determine suitability of conductors having a reduced cross-sectional area		N/A
	Under test the temperature of the luminaire wiring insulation not exceed the limits stated in Table 12.2	(see Annex 2)	N/A
	No damage to luminaire wiring after test		N/A
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/A
	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/A
	Basic insulation only accessible under lamp or starter replacement		N/A
	Protection in any position		P
	Double-ended tungsten filament lamp		N/A
	Insulation lacquer not reliable		N/A
	Double-ended high pressure discharge lamp		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
1.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
1.11 (8.2.3.a)	Class II luminaire:		N/A
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A
	- basic insulation not accessible other than during starter or lamp replacement		N/A
	- glass protective shields not used as supplementary insulation		N/A
1.11 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N/A
1.11 (8.2.3.c)	SELV circuits with exposed current carrying parts:		N/A
	Ordinary luminaire:		N/A
	- touch current .....:		N/A
	- no-load voltage.....:		N/A
	Other than ordinary luminaire:		N/A
	- nominal voltage .....:		N/A
1.11 (8.2.4)	Portable luminaire have protection independent of supporting surface		N/A
1.11 (8.2.5)	Compliance with the standard test finger or relevant probe		P
1.11 (8.2.6)	Covers reliably secured		P
1.11 (8.2.7)	Discharging of capacitors ≥ 0,5 μF	4V	P
	Portable plug connected luminaire with capacitor		N/A
	Other plug connected luminaire with capacitor		N/A
	Discharge device on or within capacitor		N/A
	Discharge device mounted separately		N/A

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..... :	As normal used	—

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Clause	Requirement + Test	Result - Remark	Verdict
	- test temperature (°C)..... :	55°C	—
	- total duration (h)..... :	240h	—
	- supply voltage: Un factor; calculated voltage (V)... :	1,1X240V	—
	- lamp used..... :	LED	—
1.12 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N/A
	- 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)	N/A
1.12 (12.6)	Thermal test (failed lamp control gear condition):		N/A
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/A
	- measured winding temperature (°C): at 1,1 Un ..... :		—
	- measured mounting surface temperature (°C) at 1,1 Un..... :		N/A
	- calculated mounting surface temperature (°C) ..... :		N/A
	- track-mounted luminaires		N/A
1.12 (12.6.2)	Temperature sensing control		N/A
	- case of abnormal conditions..... :		—
	- thermal link		N/A
	- manual reset cut-out		N/A
	- auto reset cut-out		N/A
	- measured mounting surface temperature (°C)..... :		N/A
	- track-mounted luminaires		N/A
1.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N/A
1.12 (12.7.1)	Luminaire without temperature sensing control		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
1.12 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N/A
	Test method 12.7.1.1 or Annex W .....:		—
	Test according to 12.7.1.1:		N/A
	- case of abnormal conditions.....:		—
	- Ballast failure at supply voltage (V) .....:		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
	Test according to Annex W:		N/A
	- 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.....:	See Table 1.15 (13.2.1)	N/A
1.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N/A
	- 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.....:	See Table 1.15 (13.2.1)	N/A
1.12 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N/A
	- case of abnormal conditions.....:		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
1.12 (12.7.2)	Luminaire with temperature sensing control		N/A
	- thermal link.....:	Yes ☐ No ☐	—
	- manual reset cut-out.....:	Yes ☐ No ☐	—
	- auto reset cut-out.....:	Yes ☐ No ☐	—
	- case of abnormal conditions.....:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	- highest measured temperature of fixing point/ exposed part (°C):..... :		—
	Ball-pressure test:.....:	See Table 1.15 (13.2.1)	N/A
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		P
1.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		—
	- classification according to IP..... :	IP65	—
	- mounting position during test.....:		—
	- fixing screws tightened; torque (Nm).....:		—
	- tests according to clauses.....:		—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N/A
	b) no talcum in dust- tight luminaire		P
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		P
	d) i) For luminaires without drain holes – no water entry		P
	d) ii) For luminaires with drain holes – no hazardous water entry		N/A
	e) no water in watertight luminaire		N/A
	f) no contact with live parts (IP 2X)		N/A
	f) no entry into enclosure (IP 3X and IP 4X)		N/A
	f) no contact with live parts (IP3X and IP4X)		N/A
	g) no trace of water on part of lamp requiring protection from splashing water		P
	h) no damage of protective shield or glass envelope		P
1.13 (9.3)	Humidity test 48 h	25°C, 93%RH	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/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- between current-carrying parts of different polarity:		N/A
	- between current-carrying parts and mounting surface.....:		N/A
	- between current-carrying parts and metal parts of the luminaire.....:		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :		N/A
	- Insulation bushings as described in Section 5 ..... :		N/A
	Other than SELV		P
	- between live parts of different polarity..... :	>100 MΩ	P
	- between live parts and mounting surface.....:	>100 MΩ	P
	- between live parts and metal parts.....:	>100 MΩ	P
	- between live parts of different polarity through action of a switch.....:		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :		N/A
	- Insulation bushings as described in Section 5 .....:		N/A
1.14 (10.2.2)	Electric strength test		P
	Dummy lamp		N/A
	Luminaires with ignitors after 24 h test		N/A
	Luminaires with manual ignitors		N/A
	Test voltage (V).....:		P
	SELV		N/A
	- between current-carrying parts of different polarity:		N/A
	- between current-carrying parts and mounting surface.....:		N/A
	- between current-carrying parts and metal parts of the luminaire.....:		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :		N/A
	- Insulation bushings as described in Section 5 ..... :		N/A
	Other than SELV		P
	- between live parts of different polarity..... :	1480Vac	P
	- between live parts and mounting surface.....:	1480Vac	P

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- between live parts and metal parts.....:	1480Vac	P
	- between live parts of different polarity through action of a switch.....:		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts.....:		N/A
	- Insulation bushings as described in Section 5 .....:		N/A
1.14 (10.3)	Touch current or protective conductor current (mA).:	0,22mA; limit: 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)	P
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/A
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						
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						

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Clause	Requirement + Test	Result - Remark	Verdict

Required basic insulation		0,2	0,8	1,5	3	4	5,5
Measured							
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/A**
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

Measured TABLE:

1.7 (11.2)	**TABLES: Creepage distances and clearances**					**P**
Test Location	Working voltage	Measured cl (mm)	Required cl (mm)	Measured cr (mm)	Required cr (mm)	Verdict
L/N	240V~	3,2	1,5	3,2	2,5	Pass
Current-carrying parts and accessible parts	240V~	3,8	1,5	3,8	2,5	Pass
Current-carrying parts and mounting surface	240V~	3,8	1,5	3,8	2,5	Pass

1.15 (13.2.1)	**TABLE: Ball Pressure Test of Thermoplastics**			**P**
Allowed impression diameter (mm) .....:		2,0mm		—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
Plastic enclosure	--	81°C	1,1mm	
LED cover	--	86°C	0,9mm	
Bobbin	--	125°C	0,6mm	
Driver PCB	--	125°C	0,6mm	
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
Bobbin	--	10s	No	2,0s	P
Driver PCB	--	10s	No	4,3s	P
Supplementary information:--					

1.15 (13.3.2)	**TABLE: Glow-wire test (IEC 60695-2-11)**				**P**
Glow wire temperature .....:		650°C			—
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
Plastic enclosure	--	30s	No	0s	P
LED cover	--	30s	No	0s	P

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Clause	Requirement + Test	Result - Remark	Verdict

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).....:	Yes
Supplementary information:--	

*1.15 (13.4)	**TABLE: Proof tracking test (IEC 60112)**				**N/A**
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					--
Object / part No.	**Code**	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
Internal wire	C	DongGuan Nistar Transmitting Technology Co.Inc.	H05SJ-K	1x1,5mm^2	DIN EN 50525-2-41	VDE 40017570
Terminal block	B	WAGO KONTAKTTECHNIK GMBH & CO KG	222-415	400V, T110°C	EN 60998-2-2 EN 60998-1	ENEC-01360
Plastic enclosure	C	Teijin Limited Resin And Plastic	LN-2250	V-0, 120°C	EN 60598-2-1	UL E50075 Test with appliance
LED cover	C	Chang Chun Sb(Changshu) Co Ltd	EME-5051	V-0, 130°C	EN 60598-2-1	UL E223871 Test with appliance
LED PCB	C	XIAMEN LED BOARD ELECTRON-TECH CO LTD	LDB-1~10	V-0, 130°C	EN 60598-2-1	UL E347474 Test with appliance
Driver PCB	C	Global Precision Circuits Co Ltd	T-1	130°C, V-0	EN 60598-2-1	UL E324220 Test with appliance
Fuse	B	Shenzhen Lanson Electronics Co. Ltd.	3N - Serie(s)	250VAC; 2A	EN 60127-1 EN 60127-3	VDE 40016660
Varistor	B	Guangxi New Future Information Industry Co., Ltd.	05D471K	Min.320 Vac./415Vdc, 85°C	IEC 61051-1; IEC 61051-2; IEC 61051-2-2	VDE 40030322
X-capacitor	B	Carli Electronics Co Ltd	MPX	X2, 0,33µF, 275Vac, T110	IEC 60384-14	VDE 40008520
Winding	C	SHANTOU SHENGANG ELECTRICAL INDUSTRIAL CO LTD	2UEW	130°C	EN 60598-2-1	UL E239508 Test with appliance
Bobbin	C	CHANG CHUN PLASTICS CO LTD	T375J	V-0, 150°C	EN 60598-2-1	UL E59481 Test with appliance
Insulation tape	C	SUZHOU MAILADUONA ELECTRIC MATERIAL CO LTD	JY312#	130°C	EN 60598-2-1	UL E188295 Test with appliance

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:

[1)] Provided evidence ensures the agreed level of compliance. See OD-CB2039.

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

ANNEX 2	**TABLE: Temperature measurements, thermal tests of Section 12**		P
	Type reference.....:	FLT-TPT-40L15	—
	Lamp used.....:	LED lamp	—
	Lamp control gear used.....:		—
	Mounting position of luminaire.....:	See product manual	—
	Supply wattage (W).....:	41,0W	—
	Supply current (A)..... :	0,17A	—
	Calculated power factor.....:	0,947	—
	Table: measured temperatures corrected for ta = 45 °C:		P
	- abnormal operating mode.....:		—
	- test 1: rated voltage..... :		—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage.....:	1,06x240V	—
	- 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.....:		—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :	Max.1000W	—

Temperature measurements, (°C)

Part	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1	test 2	test 3	limit	test 4	limit
Terminal block	--	56,7	--	110	--	--
LED PCB	--	68,8	--	130	--	--
Internal wire near LED	--	62,1	--	90	--	--
LED cover	--	61,3	--	Ref.	--	--
Plastic enclosure	--	55,9	--	Ref.	--	--

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Clause	Requirement + Test	Result - Remark	Verdict

Driver PCB	--	87,3	--	130	--	--
VR1	--	65,4	--	85	--	--
CX1	--	82,7	--	110	--	--
LF1 winding	--	78,8	--	130	--	--
CE1	--	83,9	--	105	--	--
T1 winding	--	102,8	--	130	--	--
T1 bobbin	--	98,6	--	130	--	--
Mounting surface	--	54,5	--	90	--	--
Ambient	--	45,0	--	--	--	--
Supplementary information:						

ANNEX 3	**Screw terminals (part of the luminaire)**		N/A
(14)	**SCREW TERMINALS**		N/A
(14.2)	Type of terminal.....:		—
	Rated current (A).....:		—
(14.3.2.1)	One or more conductors		N/A
(14.3.2.2)	Special preparation		N/A
(14.3.2.3)	Terminal size		N/A
	Cross-sectional area (mm²).....:		—
(14.3.3)	Conductor space (mm).....:		N/A
(14.4)	Mechanical tests		N/A
(14.4.1)	Minimum distance		N/A
(14.4.2)	Cannot slip out		N/A
(14.4.3)	Special preparation		N/A
(14.4.4)	Nominal diameter of thread (metric ISO thread).....:	M	N/A
	External wiring		N/A
	No soft metal		N/A
(14.4.5)	Corrosion		N/A
(14.4.6)	Nominal diameter of thread (mm).....:		N/A
	Torque (Nm).....:		N/A
(14.4.7)	Between metal surfaces		N/A
	Lug terminal		N/A
	Mantle terminal		N/A

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Pull test; pull (N)..... :		N/A
(14.4.8)	Without undue damage		N/A
ANNEX 4	**Screwless terminals (part of the luminaire)**		N/A
(15)	**SCREWLESS TERMINALS**		N/A
(15.2)	Type of terminal..... :		—
	Rated current (A)..... :		—
(15.3.1)	Material		N/A
(15.3.2)	Clamping		N/A
(15.3.3)	Stop		N/A
(15.3.4)	Unprepared conductors		N/A
(15.3.5)	Pressure on insulating material		N/A
(15.3.6)	Clear connection method		N/A
(15.3.7)	Clamping independently		N/A
(15.3.8)	Fixed in position		N/A
(15.3.10)	Conductor size		N/A
	Type of conductor		N/A
(15.5)	Terminals and connections for internal wiring		N/A
(15.5.1)	Mechanical tests		N/A
(15.5.1.1.1)	Pull test spring-type terminals (4 N, 4 samples)..... :		N/A
(15.5.1.1.2)	Pull test pin or tab terminals (4 N, 4 samples)..... :		N/A
	Insertion force not exceeding 50 N		N/A
(15.5.1.2)	Permanent connections: pull-off test (20 N)		N/A
(15.5.2)	Electrical tests		N/A
	Voltage drop (mV) after 1 h (4 samples)..... :		N/A
	Voltage drop of two inseparable joints		N/A
	Number of cycles:		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples)..... :		N/A
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples)..... :		N/A
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples)..... :		N/A
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples)..... :		N/A

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

(15.6)	Terminals and connections for external wiring		N/A
(15.6.1)	Conductors		N/A
	Terminal size and rating		N/A
15.6.2	Mechanical tests		N/A
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) ..... :		N/A
(15.6.2.2)	Pull test pin or tab terminals (4 samples); pull (N) .....:		N/A
(15.6.3)	Electrical tests		N/A
	Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1		N/A

(15.6.3.1) (15.6.3.2)	**TABLE: Contact resistance test / Heating tests**									N/A
	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:--										

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	ANNEX 5: EMF test result according to IEC/EN 62493		P
4	**LIMITS**		P
4.1	**General**		P
	Comply with Van der Hoofden test limit in 4.2.3 or inherently compliant in 4.2.2 and pass assessment procedure for intentional radiators in 4.3		P
4.2	**Unintentional radiating part of lighting equipment**		P
4.2.2	Lighting equipment deemed to comply with the Van der Hoofden test without testing		P
	1) electronic controlgear	Yes ☐ No ☒	—
	2) incandescent-lamp technology	Yes ☐ No ☒	—
	3) LED-light-source technology	Yes ☒ No ☐	—
	4) OLED-light-source technology	Yes ☐ No ☒	—
	5) high-pressure discharge lamp LED-light-source technologies	Yes ☐ No ☒	—
	6) low-pressure discharge lamp technologies with exposure distance ≥ 50 cm	Yes ☐ No ☒	—
	7) independent auxiliary	Yes ☐ No ☒	—
	Not fulfil any of 1-7 above subject to 4.2.3		—
4.2.3	Applications of limits		N/A
	Not fulfil any of 1-7 in 4.2.2 but the compliance factor *F* is ≤ 1		N/A
4.3	**Intentional radiating part of lighting equipment**		N/A
	Comply with one of methods in Clause 7 if intentional radiator		N/A

6	**MEASUREMENT PROCEDURE FOR THE VAN DER HOOFDEN TEST**		N/A
6.1	**General**		N/A
	Measurements carried out under conditions according Clause 6.1 – 6.6	See Table 6	N/A

7	**ASSESSMENT PROCEDURE INTENTIONAL RADIATORS**		N/A
7.2	**Low-power exclusion method**		N/A
7.2.1	Input $P_{int,rad}$.....:		—
	Exclusion level P_{max}.....:		—
	Input power $P_{int,rad}$ < exclusion level P_{max}		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

7.3	**Application of the EMF product standard for body worn-equipment**		N/A
	If not Clause 7.2 is met and expose distance ≤ 0.05 m, comply with IEC 62209-2		N/A
7.4	**Application of the EMF product standard for base stations**		N/A
	If not Clause 7.2 is met and if intentional radiator is base station, comply with IEC 62232		N/A
7.5	**Application of another EMF standard**		N/A
	If not Clause 7.2 is met and if intentional radiator cannot be considered as in Clause 7.3 or 7.4, comply with IEC 62311		N/A

6	**TABLE: Measurement results with Van der Hoofden test head**				N/A
Location of EUT	Test model	Measuring distance	Result(F)	Limit(F)	Verdict
Reference Annex B of IEC/EN 62493:2015	--	--	--	≤1.0	N/A

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Attachment No.1

IEC 60598_2_1F-ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 60598-2-1
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES

Luminaires

Part 2: Particular requirements

Section 1: Fixed general purpose luminaires

Differences according to..... : EN 60598-2-1:1989 used in conjunction with EN 60598-1:2015+A1:2018

	CENELEC COMMON MODIFICATIONS (EN)	P

1.5 (3)	**MARKING**		**P**
1.5 (3.3.101)	For luminaires not supplied with terminal block: Adequate warning on the package		P

1.6 (4)	**CONSTRUCTION**		N/A
1.6 (4.11.6)	Electro-mechanical contact systems		N/A

1.10 (5)	**EXTERNAL AND INTERNAL WIRING**		**P**
1.10 (5.2.1)	Connecting leads		N/A
	- without a means for connection to the supply		N/A
	- terminal block specified		N/A
	- relevant information provided		N/A
	- compliance with 4.6, 4.7.1, 4.7.2, 4.10.1, 11.2, 12 and 13.2 of Part 1		N/A
1.10 (5.2.2)	Cables equal to EN 50525		N/A
	Replace table 5.1 – Supply cord		P

1.12 (12)	**ENDURANCE TESTS AND THERMAL TESTS**		**P**
1.12 (12.4.2c)	Thermal test (normal operation) see footnote c to table 12.2 relating to unsleeved fixed wiring		P
ZB	**ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)**		P
(3.3)	DK: power supply cords of class I luminaires with label		N/A

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Attachment No.1

IEC 60598_2_1F-ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
(4.5.1)	DK: socket- outlets		N/A
(5.2.1)	CY, DK, FI, GB: type of plug		P
ZC	**ANNEX ZC, NATIONAL DEVIATIONS (EN)**		N/A
(4 & 5)	FR: Shuttered socket-outlets 10/16A		N/A
	FR: Safety requirements for high buildings (Arrêté du 30 décembre 2011 portant règlement de sécurité pour la construction des immeubles de grande hauteur et leur protection contre les risques d'incendie et de panique; Section VIII; Article GH 48, Eclairage) Glow-wire test for outer parts of luminaires:		N/A
	- 850°C for luminaires in stairways and horizontal travel paths		N/A
	- 650°C for indoor luminaires		N/A
(13.3)	GB: Requirements according to United Kingdom Building Regulation		N/A

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Attachment No.2

IEC/EN 62031 LED modules for general lighting - Safety specifications			
Clause	Requirement + Test	Result - Remark	Verdict
6	Classification		---
	Built-in.....:		N/A
	Independent.....:		N/A
	Integral.....:		P
7	Marking		N/A
7.1	Mandatory marking for built-in or independent modules		N/A
7.2	Location of marking		N/A
7.3	Durability and legibility of marking		N/A
8	Terminals		N/A
9	Provisions for protective earthing		N/A
10	Protection against accidental contact with live parts		N/A
11	Moisture resistance and insulation		P
12	Electric strength		P
13	Fault conditions		P
13.1	Fault conditions accrding to IEC 61347-1, Clause 14		P
13.2	Overpower condition	No damage	P
14	Conformity testing during manufacture		N/A
15	Construction		P
	Non Wood, cotton, silk, paper and similar fibrous material used as insulation.		P
16	Creepage distances and clearances		N/A
17	Screws, current-carrying parts and connections		N/A
18	Resistance to heat, fire and tracking		N/A
19	Resistance to corrosion		N/A
20	Information for luminaire design		N/A
21	Heat management		N/A
22	Photobiological safety		P
22.1	UV radiation		N/A
22.2	Blue light hazard		P
22.3	Infrared radiation		N/A
Annex A	Test		--
Annex C	Conformity testing during manufacture		--
Annex D	Information for luminaire design		--

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Attachment No.3

IEC/EN 62471 Photobiological safety of lamps and lamp systems			
Clause	Requirement + Test	Result - Remark	Verdict
4	**EXPOSURE LIMITS (EL'S)**		**---**
4.2	Specific factors involved in the determination and application of retinal exposure limits		P
4.2.1	Pupil diameter		P
4.2.2	Angular subtense of source and measurement field-of-view		P
4.3	Hazard exposure limits		P
4.3.1	Actinic UV hazard exposure limit for the skin and eye		N/A
4.3.2	Near-UV hazard exposure limit for the eye		N/A
4.3.3	Retinal blue light hazard exposure limit		P
4.3.4	Retinal blue light hazard exposure limit - small source		P
4.3.5	Retinal thermal hazard exposure limit		N/A
4.3.6	Retinal thermal hazard exposure limit – weak visual stimulus		P
4.3.7	Infrared radiation hazard exposure limits for the eye		N/A
4.3.8	Thermal hazard exposure limit for the skin		P
5	**MEASUREMENT OF LAMPS AND LAMP SYSTEMS**		**P**
5.1	Measurement conditions		P
5.1.1	Lamp ageing (seasoning)		P
5.1.2	Test environment		P
5.1.3	Extraneous radiation		P
5.1.4	Lamp operation		P
5.1.5	Lamp system operation		P
5.2	Measurement procedure		P
5.2.1	Irradiance measurements		P
5.2.2	Radiance measurements		P
5.2.3	Measurement of source size		P
5.2.4	Pulse width measurement for pulsed sources		N/A
5.3	Analysis methods		P
5.3.1	Weighting curve interpolations		P
5.3.2	Calculations		P
5.3.3	Measurement uncertainty		P
6	**LAMP CLASSIFICATION**		**N/A**
6.1	Continuous wave lamps		N/A
6.1.1	Exempt group		N/A
6.1.2	Risk Group 1 (Low-Risk)		N/A
6.1.3	Risk Group 2 (Moderate-Risk)		N/A
6.1.4	Risk Group 3 (High-Risk)		N/A

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IEC/EN 62471 Photobiological safety of lamps and lamp systems			
Clause	Requirement + Test	Result - Remark	Verdict
6.2	Pulsed lamps		N/A
Annex A	**SUMMARY OF BIOLOGICAL EFFECTS**		**--**
Annex B	**MEASUREMENT METHOD**		**--**
Annex C	**UNCERTAINTY ANALYSIS**		**--**
Annex D	**GENERAL REFERENCES**		**--**

Table 6.1	**Emission limits for risk groups of continuous wave lamps**									**N/A**
Risk	**Action spectrum**	**Symbol**	**Units**	**Emission Measurement**						
				Exempt		**Low risk**		**Mod risk**		
				Limit	**Result**	**Limit**	**Result**	**Limit**	**Result**
Actinic UV	SUV(λ)	Es	$W•m^{-2}$	0,001	-	-	-	-	-
Near UV		E_{UVA}	$W•m^{-2}$	0,33	-	-	-	-	-
Blue light	B(λ)	L_B	$W•m^{-2}•sr^{-1}$	100	-	10000	-	4000000	-
Blue light, small source	B(λ)	E_B	$W•m^{-2}$	0,01*	-	1,0	-	400	-
Retinal thermal	R(λ)	L_R	$W•m^{-2}•sr^{-1}$	28000/α	-	28000/α	-	71000/α	-
Retinal thermal, weak visual stimulus**	R(λ)	L_{IR}	$W•m^{-2}•sr^{-1}$	545000 0,0017 ≦α≦ 0,011	-	-	-	-	-
				6000/α 0,011 ≦ α≦0.1	-	-	-	-	-
IR radiation, eye		E_{IR}	$W•m^{-2}$	100	-	570	-	3200	-

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Table 6.1	Emission limits for risk groups of continuous wave lamps	N/A

* Small source defined as one with α < 0,011 radian. Averaging field of view at 10000 s is 0,1 radian.
** Involves evaluation of non-GLS source

Note: The action functions: see Table 4.1 and Table 4.2
The applicable aperture diameters: see 4.2.1
The limitations for the angular subtenses: see 4.2.2
The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5

Table 4.7 (4.24)	Spectroradiometric measurement (IEC 62778)		--
	Measurement performed on:	**Luminaire**	--
	Model number.....	FLT-TPT-40L15	--
	Test voltage (V).....	240V	--
	Test current (mA).....	--	--
	Test frequency (Hz).....	50	--
	Ambient, t (°C).....	25,0	--
	Measurement distance.....	☒ 20 cm ☐ ... cm	--
	Source size	☒ Non-small ☐ Small : .... mm	--
	Field of view	☐ 100 mrad ☒ 11 mrad ☐ 1,7 mrad (for small sources)	--

Item	Symbol	Units	Result	Risk Group
Correlated colour temperature	CCT	K	--	--
x/y colour coordinates	--	--	--	--
Blue light hazard radiance	L_B	$W/(m^2 \cdot sr^1)$	65	☒ RG0: <100 ☐ RG1: <10000 ☐ RG2: <4000000
Blue light hazard irradiance	E_B	W/m^2	--	--
Luminance	L	cd/m^2	--	--
Illuminance	E	lx	--	--
Supplementary information:				

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Attachment No.4

IEC/EN 61347-2-13
Lamp controlgear
Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules

Clause	Requirement + Test	Result - Remark	Verdict
4(4)	**GENERAL REQUIREMENTS**		**P**
	Insulation materials compliance with Annex N		N/A
	Independent lamp controlgear compliance with EN 60598-1		N/A
	Built-in ballasts with double or reinforced insulation compliance with Annex I		N/A
	IP classification		N/A
	“F” mark		N/A
	Integral lamp controlgear compliance with clause 0.5 of EN 60598-1		P
	Built-in electronic controgear compliance with Annex O		N/A
	SELV controlgear comply with Annex L		N/A
4(--)	SELV controlgear comply with the requirements of Annex I		N/A
4(--)	A separating, isolating or autotransformer is used, it comply with the relevant parts of IEC 61558.		N/A
5(5)	**GENERAL NOTES ON TEST**		**---**
6 (6)	**CLASSIFICATION**		**---**
	Built-in controlgear.....:	Yes☐ No ☒	---
	Independent controlgear.....:	Yes☐ No ☒	---
	Integral controlgear .....:	Yes☒ No ☐	---
	Auto-wound controlgear……..:	Yes☒ No ☐	---
	Separating controlgear… ……..:	Yes☐ No ☒	---
	Isolating controlgear……..:	Yes☐ No ☒	---
	SELV controlgear……..:	Yes☐ No ☒	---
7(7)	**MARKING**		N/A
7.1(7.1)	Mandatory markings:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- mark of origin	See marking label	N/A
	- model number, type reference	See marking label	N/A
	- symbol for independent controlgear, if applicable		N/A
	- correlation between interchangeable parts and controlgear marked		N/A
	- rated supply voltage		N/A
	- earthing symbol		N/A
	- symbol of tw		N/A
	- max. enclosure temperature of ta		N/A
	- cross –section of conductors of terminal		N/A
	- lamp type and rated wattage or wattage range		N/A
	- wiring diagram		N/A
	- value of tc		N/A
	- symbol for temperature declared, thermally protected controlgear		N/A
	- heat sink(s) required		N/A
	- limiting temperature of the winding under abnormal conditions		N/A
	- the rated no-load output voltage		N/A
	- symbol of SELV		N/A
	- maximum working voltage Uout		N/A
7.1(--)	Constant voltage types		N/A
	- rated output power		N/A
	- rated output voltage		N/A
	Constant current types		N/A
	- rated output power		N/A
	- rated output current		N/A
	Operation with LED modules only		N/A
7.2(--)	Information to be provided if applicable		N/A
	- mains-connected windings of transformer		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
(7.2)	Marking durable and legible		N/A
	Rubbing 15 s water, 15 s petroleum; marking legible		N/A
8(10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		P
8.1(10.1)	Lamp controlgear which do not rely upon the luminaire enclosure for protection against electric shock compliance Annex A		N/A
	Integral lamp controlgear, which relies upon the luminaire enclosure for protection		P
	Lacquer or enamel is not considered		N/A
	Parts providing protection against accidental contact have adequate mechanical strength		N/A
	- a force of 10 N test with test finger		N/A
8.2(10.2)	Capacitors > 0,5 μF: voltage after 1 min (V): < 50V:	4V	P
8.3(10.3)	SELV-equivalent controlgear accessible parts are insulated from live parts by double or reinforced insulation		N/A
	SELV output circuits is be electrically separated from earth by at least basic insulation		N/A
	Controlgears providing ELV conductive parts is insulation		N/A
8.4(10.4)	SELV may be have accessible		N/A
	The rated output voltage under load does not exceed 25Vr.m.s. or 60Vd.c		N/A
	Ripple free d.c. where the voltage exceeds 25Vr.m.s. or 60Vripple free d.c.		N/A
	– for a.c.: 0,7 mA (peak);		N/A
	– for d.c.: 2,0 mA;		N/A
	– the no-load output does not exceed 35Vpeak or 60Vripple free d.c.		N/A
	If exceeding the values given above, compliance with 500Vdc insulation test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	One capacitor Y1 or two capacitors Y2 of the same values used in series between live parts and the body or primary and secondary circuits - Capacitor complying with IEC 60384-14 - Other components bridging the separating transformer complying with IEC 60065, clause 14		N/A

9(8)	**TERMINAL**		N/A
9 (8.1)	Screw terminals shall comply with Clause 14 of IEC60598-1.		N/A
	Screwless terminals shall comply with Clause 15 of IEC60598-1.		N/A
9 (8.2)	Terminals other than integral terminals		N/A
	Comply with relevant IEC standard	(see Annex 1)	N/A
	Suit the conditions		N/A
	Satisfy additional relevant requirements of this standard		N/A

10(9)	**PROVISIONS FOR PROTECTIVE EARTHING (EARTHING)**		**N/A**
10.1(9.1)	Provisions for protective earthing		N/A
	Earthing terminals compliance with clause 8 of EN 61347-1		N/A
	Contact no-rusting or bare metal		N/A
	Protective earth, symbol		N/A
10.2(9.2)	Provisions for functional earthing		N/A
10.3(9.3)	Lamp controlgear with conductors for protective earthing by tracks on printed circuit boards		N/A
	a.c. current of 25 A for 1 min between the earthing terminal or earthing contact and each of the accessible metal parts, measured resistance (Ω): < 0,5 Ω		N/A
10.4(9.4)	Earthing of built-in lamp controlgear		N/A
10.5(9.5)	Earthing via independent controlgear		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
10.5.1(9.5.1)	Earth connection to other equipment		N/A
	minimum cross-section of 1,5mm^2 and be of copper, or an equivalent conductive material		N/A
10.5.2(9.5.2)	Earthing of the lamp compartments powered via the independent lamp controlgear		N/A
	a.c. current of 25 A for 1 min between the earthing terminal or earthing contact and each of the accessible metal parts, measured resistance (Ω): < 0,5 Ω		N/A
	a.c. current of 10 A for 1 min between the earthing terminal or earthing contact and the accessible metal parts, measured resistance (Ω): < 0,5 Ω		N/A
11 (11)	**MOISTURE RESISTANCE AND INSULATION**		**P**
	After storage 48 h at 91- 95% relative humidity and 20- 30℃ measuring of insulation resistance with d.c. 500 V (MΩ):		P
	⩾ 2 MΩ for basic insulation..... :		P
	⩾ 4 MΩ for double or reinforced insulation ..... :		N/A
	For insulation between primary and secondary circuits with SELV controlgear		N/A
12(12)	**ELECTRIC STRENGTH**		**P**
	Immediately after clause 11 electric strength test for 1 min		P
	Basic insulation for voltages of SELV		N/A
	Up to and including 50 V		N/A
	Above 50Vup to and including 1 000 V		N/A
	- basic insulation (2U+1000)		P
	- supplementary insulation (2U+1000)		N/A
	- double or reinforced insulation (4U+2000)		N/A
	Solid or thin sheet insulation		N/A
	No flashover or breakdown after electric strength test		P
13(13)	**THERMAL ENDURANCE TEST FOR WINDINGS OF BALLAST**		**---**

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Clause	Requirement + Test	Result - Remark	Verdict
14(14)	**FAULT CONDITIONS**		P
	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
	lamp controlgear marked with a protective earthing symbol		P
	lamp controlgear marked with a functional earthing symbol		N/A
	Thermally protected controlgear does not exceed the marked temperature value		N/A
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	See below.	P
14.1(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)	Refer to table 14	P
	Distances on printed boards provided with coating according to IEC 60664-3		P
14.2(14.2)	Short-circuit or interruption of semiconductor devices	Refer to table 14	P
14.3(14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile	Refer to table 14	P
14.4(14.4)	Short-circuit across electrolytic capacitors	Refer to table 14	P
14.5(14.5)	After the tests the insulation resistance with d.c. 500 V (MΩ) are ⩾ 1 MΩ ..... :		P
	After the tests the accessible parts has not become live		P
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P
	Accessible parts compliance with Annex A		N/A
14(--)	controlgear provided with the marking  , comply with the requirements specified in Annex C		N/A

15(--)	**TRANSFORMER HEATING**	**P**

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Clause	Requirement + Test	Result - Remark	Verdict
15.1	controlgear contains an SELV, isolating and separating transformer, compliance with Clauses L.6 and L.7 of EN 61347-1:2007/AMD2:2012		P
15.2	Normal operation		P
	Test voltage at rated supply voltage		P
15.3	Abnormal operation		P
	Test voltage between 90 % and 110 % of the rated supply voltage		P
	Connect double the LED modules or equivalent load		P
	- in parallel to the output terminals, for constant voltage output types		N/A
	- in series to the output terminals, for the constant current output types		P
	No LED module inserted		P
	Output terminal short-circuited		P

16(15)	**CONSTRUCTION**		**P**
16.1(15.1)	Wood, cotton, silk, paper and similar fibrous Material not used as insulation		P
16.2(15.2)	Printed boards used as internal connections complies with clause 14 of EN 61347-1		P
16.3(15.3)	Plugs and socket-outlets used in SELV or ELV circuits		N/A
	Plugs and socket-outlets for SELV system comply with the requirements of IEC 60906-3 and IEC60884-2-4.		N/A
	Plugs and socket-outlets for SELV systems with both a rated current ~ 3A and a maximum voltage of 25Va.c. or 60Vd.c. with a power not exceeding 72W		N/A
	- plugs not be able to enter socket-outlets of other standardised systems;		N/A
	- socket-outlets shall not admit plugs of other standardised voltage systems;		N/A
	- socket-outlets shall not have a protective earth contact		N/A

17(16)	**CREEPAGE DISTANCES AND CLEARANCES**	**P**

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Clause	Requirement + Test	Result - Remark	Verdict
	Creepage distances and clearances according to Table 3 and 4, as appropriate		P
	Printed boards see clause 14 of EN 61347-1		P
	SELV controlgears according to Annex L		N/A
18(17)	**SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS**		**N/A**
	Screws, current-carrying parts and connections in compliance with EN 60598-1		N/A
19(18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		**P**
19.1(18.1)	Parts of insulating Material retaining live parts in position, ball-pressure test:		P
	- part; test temperature (℃) .....:	See report IEC/EN 60598-2-1	P
	- part; test temperature (℃) .....:		N/A
19.2(18.2)	Printed boards in accordance with IEC 60249- 1,		N/A
19.3(18.3)	External parts of insulating Material preventing electric shock glow-wire test 650 ℃	See report IEC/EN 60598-2-1	P
19.4(18.4)	Parts of insulating Material retaining live parts in position, needle-flame test 10 s:		P
	- flame extinguished within 30 s	See report IEC/EN 60598-2-1	P
	- no flaming drops igniting tissue paper		P
19.5(18.5)	Tracking test		N/A
20(19)	**RESISTANCE TO CORROSION**		**N/A**
	Rust protection:		N/A
	- test according 4.18.1 of EN 60598-1		N/A
	- adequate varnish on the outer surface		N/A
21 (-)	**MAXIMUM WORKING VOLTAGE (Uout) IN ANY LOAD CONDITION**		**P**
	Not exceed declared maximum working voltage Uout in any load condition		P
(20)	**NO-LOAD OUTPUT VOLTAGE**		**P**

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Clause	Requirement + Test	Result - Remark	Verdict
	Only applicable for magnetic lamp controlgear with integrated transformer, operating with supply frequencies		P
	No load output voltage not differ more than 10 % from rated voltage		P

Annex A	**TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS A LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK**		N/A
A.1	According to Clause A.2 and A.3		N/A
A.2	The voltage not exceed 35Va.c. peak or 60Vripple free d.c.		N/A
A.3	Where the voltage exceeds 35Va.c. peak or 60Vripple free d.c. or a protective impedance device is used the touch-current shall not exceed:		N/A
	- for a.c.:0,7 mA (peak);		N/A
	- for d.c.: 2,0 mA		N/A

Annex B	**PARTICULAR REQUIREMENTS FOR THERMALLY PROTECTED LAMP CONTROLGEAR**		N/A
B.7	Marking		N/A
	- the symbol for "class P" thermally protected lamp controlgear		N/A
	- the symbol for temperature declared thermally protected lamp controlgear		N/A
B.8	Thermal endurance of windings		N/A
B.9	Lamp controlgear heating		N/A
B.9.1	Preselection test		N/A
B.9.2	“Class P” thermally protected lamp controlgear		N/A
B.9.3	Temperature declared thermally protected lamp controlgear as specified inIEC61347-2-8, with a rated maximum case temperature of 130°C or lower		N/A
B.9.4	Temperature declared thermally protected lamp controlgear as specifiedin IEC61347-2-8 with a rated maximum case temperature exceeding 130°C		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
B.9.5	Temperature declared thermally protected lamp controlgear as specified in IEC61347-2-9		N/A
Annex C	**PARTICULAR REQUIREMENTS FOR ELECTRONIC BALLASTS WITH MEANS OF PROTECTION AGAINST OVERHEATING**		N/A
C3	**GENERAL REQUIREMENTS**		N/A
C3.1	Thermal protection means integral with the controlgear, protected against mechanical damage		N/A
	Renewable only by means of a tool		N/A
	If function depending on polarity, for cord-connected equipment protection means in both leads		N/A
	Thermal links comply with IEC 60691		N/A
	Electrical controls comply with IEC 60730-2-3		N/A
C3.2	No risk of fire by breaking (clause C7)		N/A
C.4	General notes on tests		N/A
C.5	Classification		N/A
	a) automatic resetting type		N/A
	b) manual resetting type		N/A
	c) non-renewable, non-resetting type		N/A
	d) renewable, non-resetting type		N/A
	e) other type of thermal protection; description		N/A
C.6	Marking		N/A
C6.1	Symbol for temperature declared thermally protected ballasts		N/A
C6.2	Declaration of the type of protection provided		N/A
C7	Limitation of heating		N/A
C7.1	Preselection test		N/A
	Test sample placed for at least 12 h in an oven having temperature (tc - 5) K		N/A
	No operation of the protection device		N/A
C7.2	Functioning of protection means		N/A

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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 (tc +0; -5) ℃ is obtained		N/A
	No operation of the protection device		N/A
	Introducing of the most onerous test condition determined during test of clause 14		N/A
	Output of windings connected to the mains supply short-circuited, and other part of the controlgear operated under normal conditions		N/A
	Increasing of the current through the windings continuously until operation of the protection means		N/A
	Continuous measuring of the highest surface temperature		N/A
	Controlgear according to C5 a) or C5 e) operated until stable conditions are achieved		N/A
	Automatic-resetting thermal protectors working 3 times		N/A
	Controlgear according to C5 b) working 6 times		N/A
	Controlgear according to C5 c) and C5) d) working once		N/A
	Highest temperature does not exceed the marked value		N/A
	Any overshoot of 10% over the marked value within 15 min		N/A
Annex D	**REQUIREMENTS FOR CARRY OUT THE HEATING TESTS OF THERMALLY PROTECTED LAMP CONTROLGEAR**		N/A
D.1	Test enclosure		N/A
D.2	Heating of enclosure		N/A
D.3	Lamp controlgear operating conditions		N/A
D.4	Lamp controlgear position in the enclosure		N/A
D.5	Temperature measurements		N/A
Annex E	**ANNEX E – USE OF CONSTANT S OTHER THAN 4500 IN t_w TESTS**		N/A
E1	Constant S claimed		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Claimed test method		N/A
E2	Procedure A		N/A
	Adequate data provided by the manufacturer		N/A
	The inverse of the slope is greater than or equal to the claimed value of S		N/A
	Compliance with the failure criteria for procedure B		N/A
E3	Procedure B		N/A
	Claimed value of T1		N/A
	Claimed value of T2		N/A
	Endurance test carried out at:		N/A
	T1 (7 samples)		N/A
	T2 (7 samples)		N/A
	Duration of test calculated from equation (2)		N/A
	T1		N/A
	T2		N/A
	During the test: - No open circuit - No breakdown insulation		N/A
	The claimed constant S is deemed to be verified		N/A
Annex F	**ANNEX F - DRAUGHT-PROOF ENCLOSURE**		---
	Draught-proof enclosure in accordance with the description		N/A
	Dimensions of the enclosure		N/A
	Other design; description		N/A
Annex G	**EXPLANATION OF THE DERIVATION OF THE VALUES OF PULSE VOLTAGES**		---
Annex H	**TEST**		---

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Clause	Requirement + Test	Result - Remark	Verdict

Annex I (Annex L)	**Particular additional requirements for SELV d.c. or a.c. supplied electronic controlgear for LED modules (PARTICULAR ADDITIONAL REQUIREMENTS FOR CONTROLGEARS PROVIDING SELV)**			N/A
I.3 (L.3)	Classification			N/A
	-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 ☒	--
I.4 (L.4)	Marking			N/A
	Adequate symbols are used			N/A
I.5 (L.5)	Protection against electric shock			N/A
	Controlgears providing SELV shall, in addition to the requirements given in 10.3 and 10.4, comply with relevant requirements specified in 9.2 of IEC 61558-1:2005			N/A
I.6 (L.6)	Heating			N/A
	Compliance is checked by the relevant tests of Clause 14 of IEC 61558-1:2005, but with the following adjustments:			N/A
	– Subclause 14.1, 10th paragraph: Replace 10 % by 6 %;			N/A
	– Replace Table 1 by the following Table L.2:			N/A
I.7 (L.7)	Short-circuit and overload protection			N/A
	Compliance is checked by the relevant tests of Clause 15 of IEC 61558-1:2005, but with the following adjustments:			N/A
	- Subclause 15.1, second paragraph: Replace the reference to "14.1" by "L.6" of this annex			N/A
	– Subclause 15.1, third paragraph after Table 3: Replace the reference to "18.3" by "L.8.3" of this annex			N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– Subclause 15.3.4: This subclause is not applicable.		N/A
	– Subclause 15.5.1, third paragraph: Replace the reference to "14.2" by "L.6" of this annex.		N/A
I.8 (L.8)	Insulation resistance and electric strength		N/A
I.8.2 (L.8.2)	Insulation resistance is measured with a d.c. voltage of approximately 500 V applied, the measurement being made 1 min after application of the voltage		N/A
	- Between input circuits and output circuits ≥5MΩ		N/A
	Between metal part of class II convertors which are separated from live parts by basic insulation only and the body ≥5MΩ		N/A
	Between metal foil in contact with the inner and outer surfaces of enclosures of insulating material ≥2MΩ		N/A
I.8.3 (L.8.3)	value of the test voltage and the points of application are given in Table L.4.		N/A
I.9 (L.9)	Construction		N/A
I.9.1 (L.9.1)	The construction of transformers used in controlgears providing SELV shall be comply with all relevant parts specified in 19.12 of IEC 61558-1:2005		N/A
I.10 (L.10)	Components		N/A
	Components used as protective devices in controlgears providing SELV shall comply with relevant requirements given in 20.6, 20.7, 20.8, 20.9, 20.10 and 20.11 of IEC 61558-1:2005.		N/A
I.11 (L.11)	Creepage distances, clearances and distances through insulation		N/A
	Creepage distances, clearances and distances through insulation shall be not less than the values shown in Table 3 and Table L.5.		N/A
	In addition transformers which form an integral part of a controlgear providing SELV shall comply with relevant requirements and tests given in Clause 26 of IEC 61558-1:2005		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
Annex J (--)	**Particular additional safety requirements for a.c., a.c./d.c. or d.c. supplied electronic controlgear for emergency lighting**		N/A
J.1 (--)	General		N/A
J.2 (--)	Marking		N/A
J.2.1	Mandatory markings		N/A
	a) symbol of a.c., a.c./d.c. or d.c maintained emergency electronic controlgear	EL	N/A
	b) rated emergency power supply voltage or voltage range		N/A
J.2.2	Information to be provided if applicable		N/A
	a) Limits of the ambient temperature range		N/A
	b) Emergency output factor		N/A
	c) Information on whether the control gear is intended for use in luminaires for high-risk task area lighting		N/A
J.3	General notes on tests		N/A
J.4	Starting conditions		N/A
	Control gears shall start rated load(s) without adversely affecting the performance when operated in emergency mode		N/A
J.5	Operating condition		N/A
	The provisions of 7.2 of IEC 62384:2006 apply at 90 % and 110 % of the rated emergency supply voltage		N/A
J.6	Emergency supply current		N/A
	At the rated emergency supply voltage or voltage range, the emergency supply current shall not differ by more than ±15 % from the declared value when the control gear is operated in emergency mode with maximum load power		N/A
J.7	EMC immunity		N/A
J.8	Pulse voltage from central battery systems		N/A
	The d.c. supplied emergency controlgear shall withstand, without failure, any pulses caused by switching other equipment in the same circuit		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
J.9	Tests for abnormal conditions		N/A
	The provisions of Clause 12 of IEC 62384:2006 apply		N/A
J.10	Temperature cycling test and endurance test		N/A
	The provisions of Clause 13 of IEC 62384:2006 apply		N/A
J.11	Functional safety		N/A
	EOFx is measured 5 s and 60 s after switch on of the control gear in emergency mode at maximum emergency supply voltage and at minimum emergency supply voltage		N/A
	For the calculation of EOFx the lower value of the measurements below is used:		N/A
	a) electrical output parameter measured after 60 s at maximum voltage/electrical output parameter measured in reference setting		N/A
	b) electrical output parameter measured in steady state conditions at minimum supply voltage/electrical output parameter measured in reference setting		N/A
	After 5 s of operation with maximum emergency supply voltage at least 50 % of the declared EOFx shall be reached		N/A
(Annex I)	**ADDITIONAL REQUIREMENTS FOR BUILT-IN MAGNATIC BALLASTS WITH DOUBLE OR REINFORCED INSULATION**		---
(Annex J)	**SCHEDULE OF MORE ONEROUS REQUIREMENTS**		---
(Annex K)	**CONFORMITY TESTING DURING MANUFACTURE**		---
(Annex M)	**DIELECTRIC STRENGTH TEST VOLTAGES FOR CONTROLGEAR INTENDED FOR THE USE IN IMPULSE WITHSTAND CATEGORY III**		--
(Annex N)	**REQUIREMENTS FOR INSULATION MATERIALS USED FOR DOUBLE OR REINFORCED INSULATION**		N/A
(N.4)	Material requirements		N/A
(N.4.1)	The insulation material shall comply with IEC 60085 and the IEC 60216 series.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
(N.4.2)	The adequacy of solid insulation is verified by the electric strength test (Clause 12) of at least 5 kV or the applicable test voltage specified in Table N.1 multiplied by 1,35, whichever is the greater		N/A
(N.4.3)	Thin sheet insulation		N/A
(N.4.3.1)	Thickness and composition of thin sheet insulation		N/A
(N.4.3.2)	Mandrel test (electric strength test during mechanical stress)		N/A

(Annex O)	**ADDITIONAL REQUIREMENTS FOR BUILT-IN ELECTRONIC CONTROLGEAR WITH DOUBLE OR REINFORCED INSULATION**		N/A
(O.6)	Marking		N/A
	Built-in Electronic controlgear with double or reinforced insulation marking		N/A
(O.7)	Protection against accidental contact with live parts		N/A
	it shall not be possible for the test finger to make contact with metal parts protected by basic insulation only.		N/A
(O.8)	Terminals		N/A
	Clause 8 of this standard applies.		N/A
(O.9)	Provision for earthing		N/A
	For doubled or reinforced built-in electronic controlgear only functional earthing terminals are permitted. The requirements of Clause 9 of this standard apply to the functional earthing terminals.		N/A
(O.10)	Moisture resistance and insulation		N/A
	Clause 11 of this standard applies.		N/A
(O.11)	Electric strength		N/A
	Clause 12 of this standard applies.		N/A
(O.13)	Fault conditions		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	At the end of the tests, when the controlgear has returned to the ambient temperature, shall comply in addition to Clause O.12 between live part and accessible metal parts or external parts of insulating material in contact with the supporting surface, but with the values of the dielectric strength test reduced to 35 % of the value requested in Table 1.		N/A
	Furthermore, the insulation resistance according to Clause O.10 between live part and accessible metal parts or external parts of insulating material in contact with the supporting surface shall not be less than 4 M .		N/A
(O.14)	Construction		N/A
	All accessible metal parts of the electronic built-in electronic controlgear shall be insulated from live parts by double or reinforced insulation.		N/A
(O.15)	Creepage distances and clearances		N/A
	For built-in electronic controlgear, provided with double or reinforced insulation, the corresponding values given for luminaires in EN 60598-1 apply.		N/A
(O.16)	Screws, current-carrying parts and connections		N/A
	Clause 17 of this standard applies.		N/A
(O.17)	Resistance to heat and fire		N/A
	Clause 18 of this standard applies.		N/A
(O.18)	Resistance tocorrosion		N/A
	Clause 19 of this standard applies.		N/A
(P)	**Creepage distances and clearances and distance through isolation (DTI) for lamp controlgear which are protected against pollution by the use of coating or potting**		N/A
(P.1)	**General**		N/A
	P.2 applies if creepage distances less than the minimum in Table 7 and 8		N/A
	P.3 applies if clearance less than the minimum in Table 9, 10 and 11		N/A
(P.2)	**Creepage distances**		N/A
(P.2.2)	Minimum creepage distances for working voltages and rated voltages with frequencies up to 30 kHz (Table P.1)		N/A
	Basic or supplementary insulation:		N/A

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

(Q)	**Example for Up calculation**	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
(R)	**Concept of creepage distances and clearances**		N/A
(S)	**Examples of controlgear insulation coordination**		N/A
(T)	**Creepage distances and clearances for controlgear with a higher degree of availability (impulse withstand category III)**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

14	TABLE: tests of fault conditions		P
Part	Simulated fault	Test result	Hazard
D1	s-c	Fuse open, no flame, no flammable gas, no molten parts, no hazard.	~~YES~~ /NO
CE2	s-c	Fuse open, no flame, no flammable gas, no molten parts, no hazard.	~~YES~~ /NO
Output	s-c	Shut down, recoverable, no flame, no flammable gas, no molten parts, recoverable, no hazard.	~~YES~~ /NO

17 (16)	TABLES: Creepage distances and clearances						
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							
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							
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**						

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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							

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Attachment No.5

Photo Documentation

View:
Model:
FLT-TPT-40L15

[X]General
[ ]Front
[ ]Rear
[ ]Internal
[ ]Top
[ ]Bottom
[ ]PWB

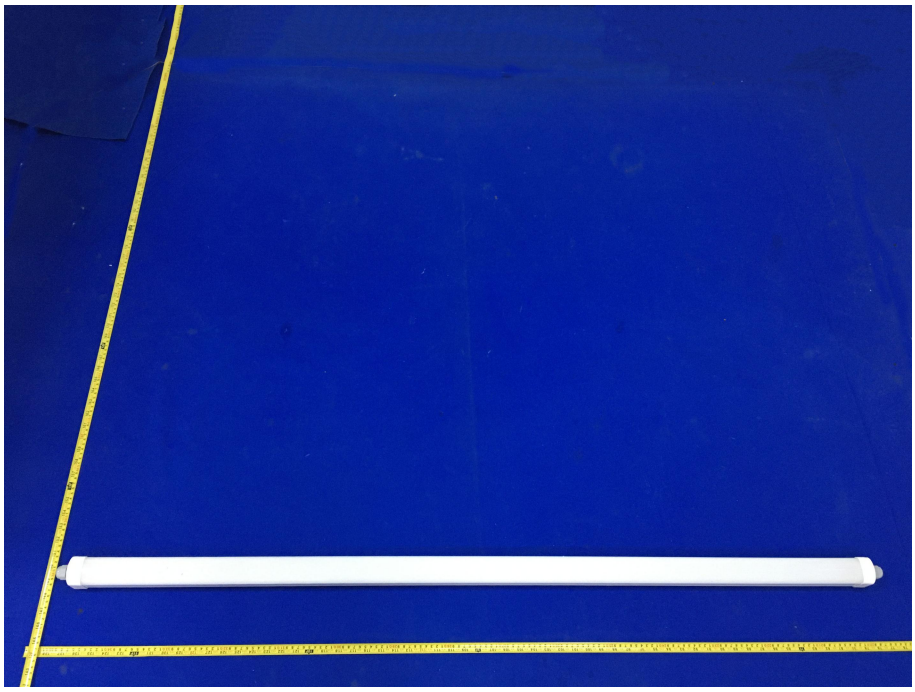

Figure 1

View:

[ ]General
[ ]Front
[X]Rear
[ ]Internal
[ ]Top
[ ]Bottom
[ ]PWB

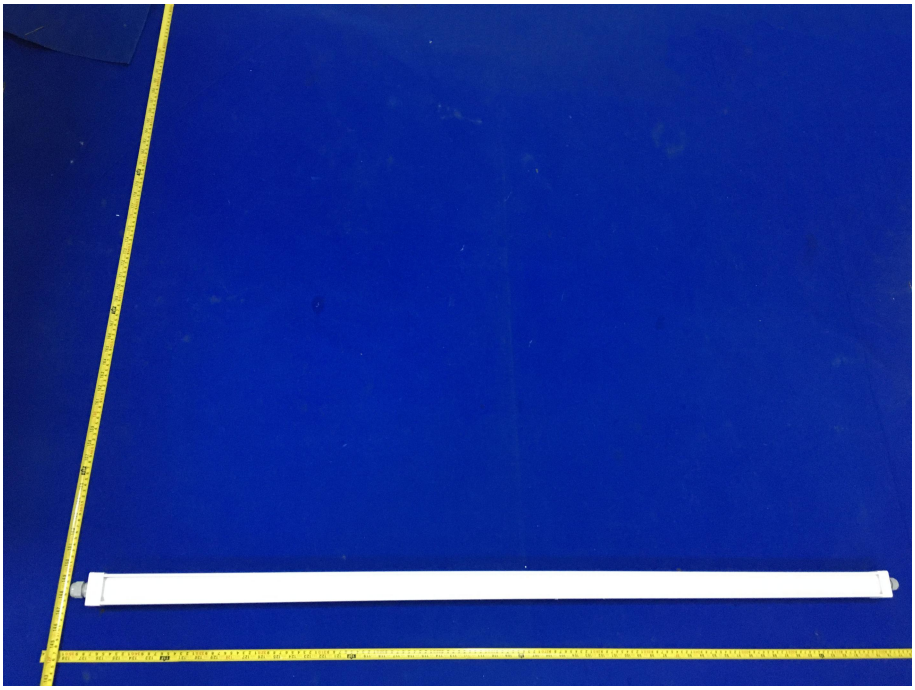

Figure 2

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Attachment No.5

Photo Documentation

View:

[X]General
[ ]Front
[ ]Rear
[ ]Internal
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Figure 3

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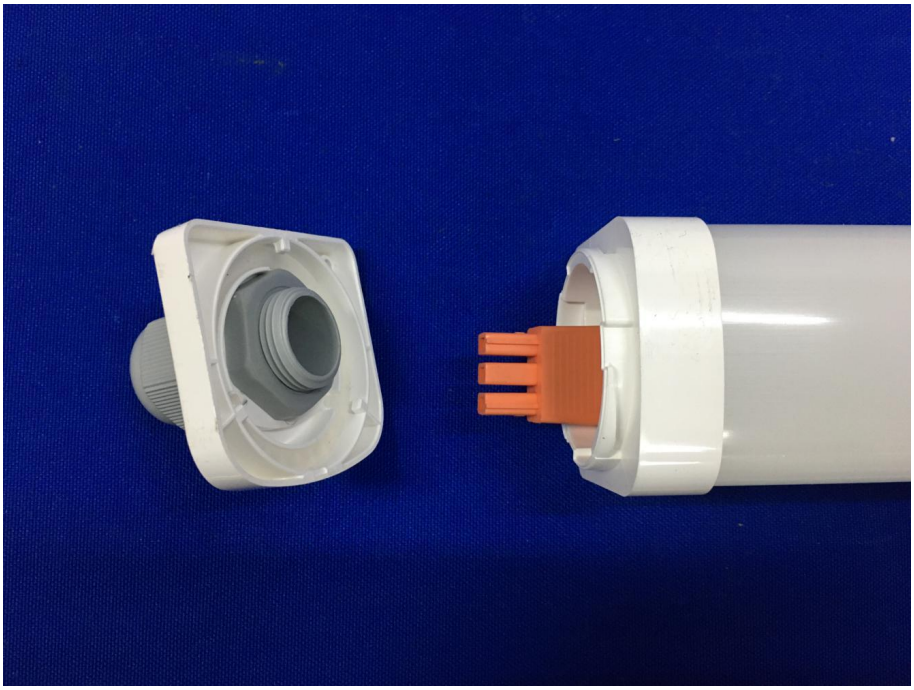

Figure 4

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Photo Documentation

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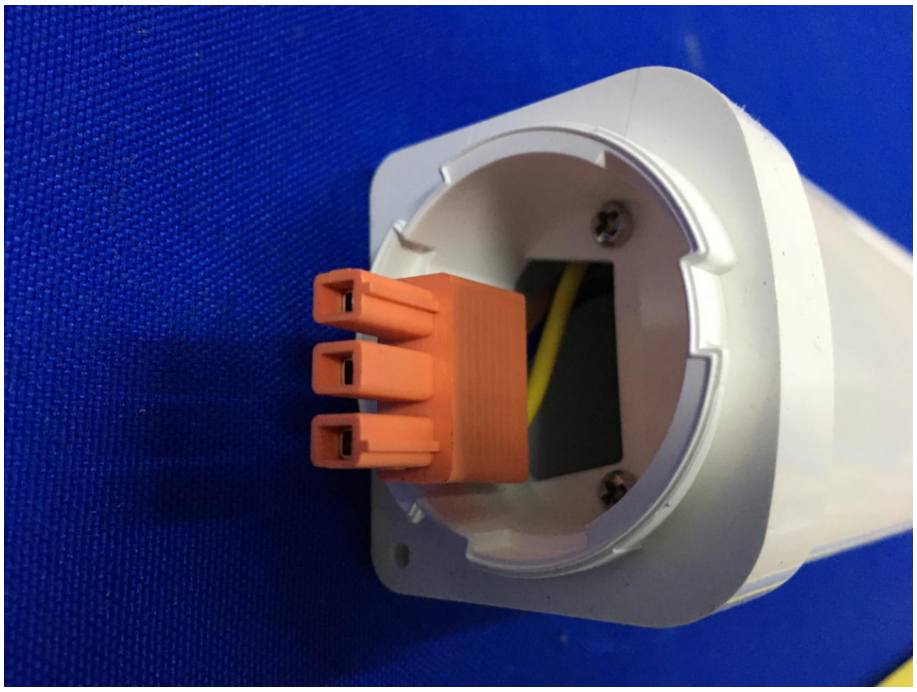

Figure 5

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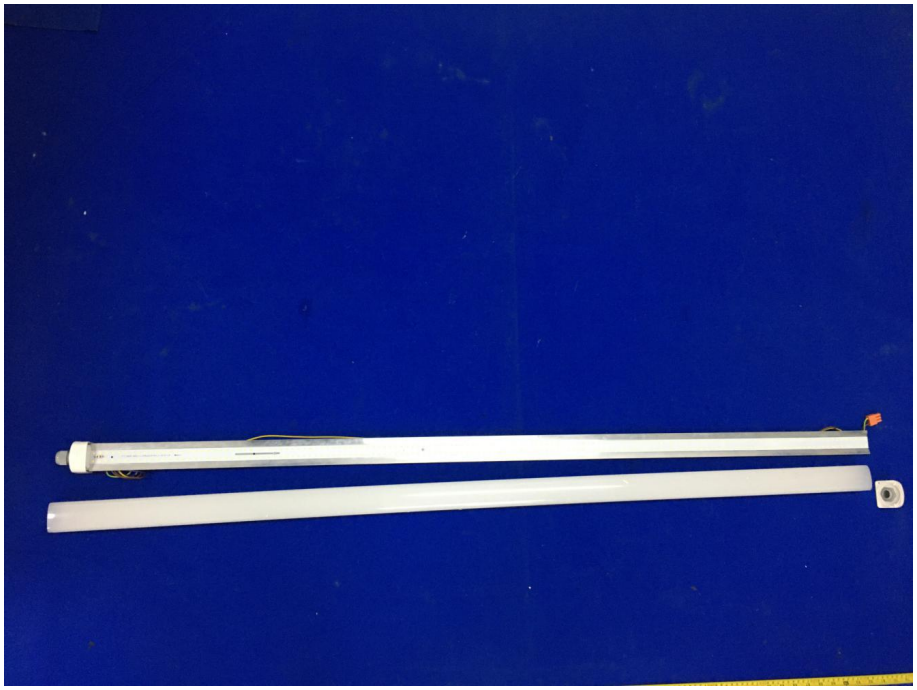

Figure 6

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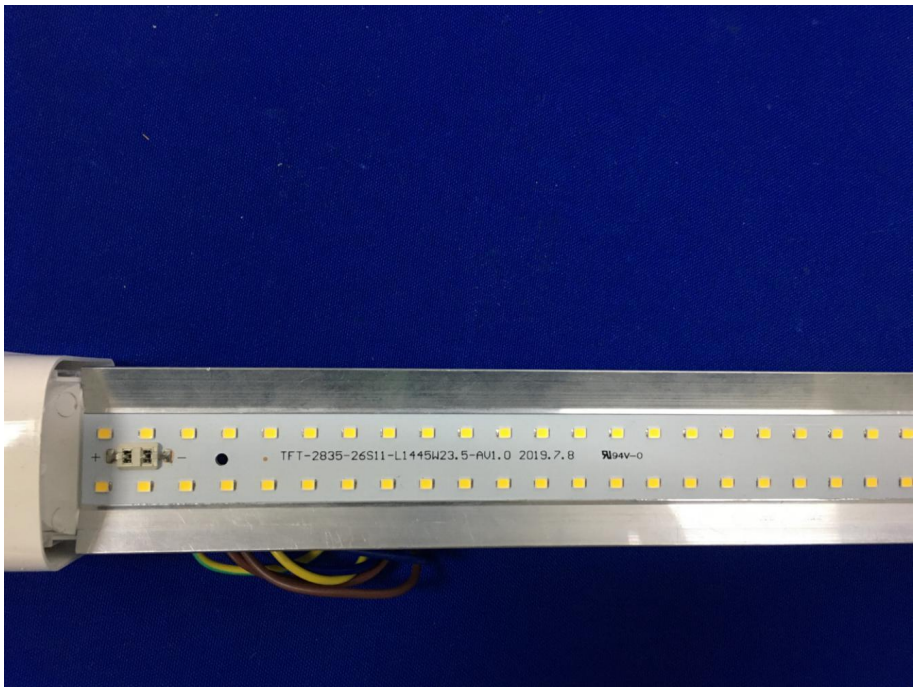

Figure 7

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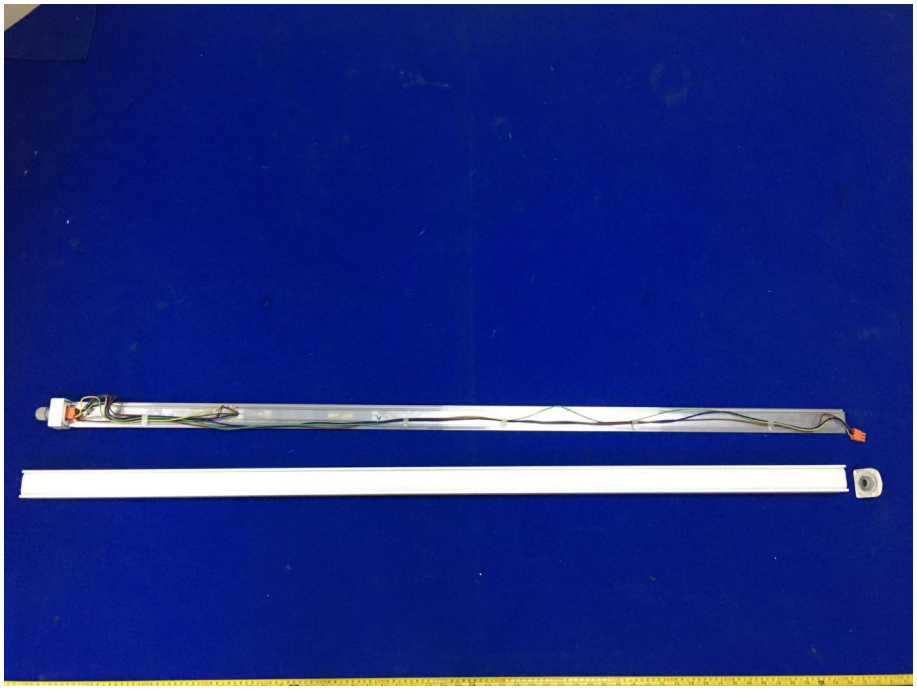

Figure 8

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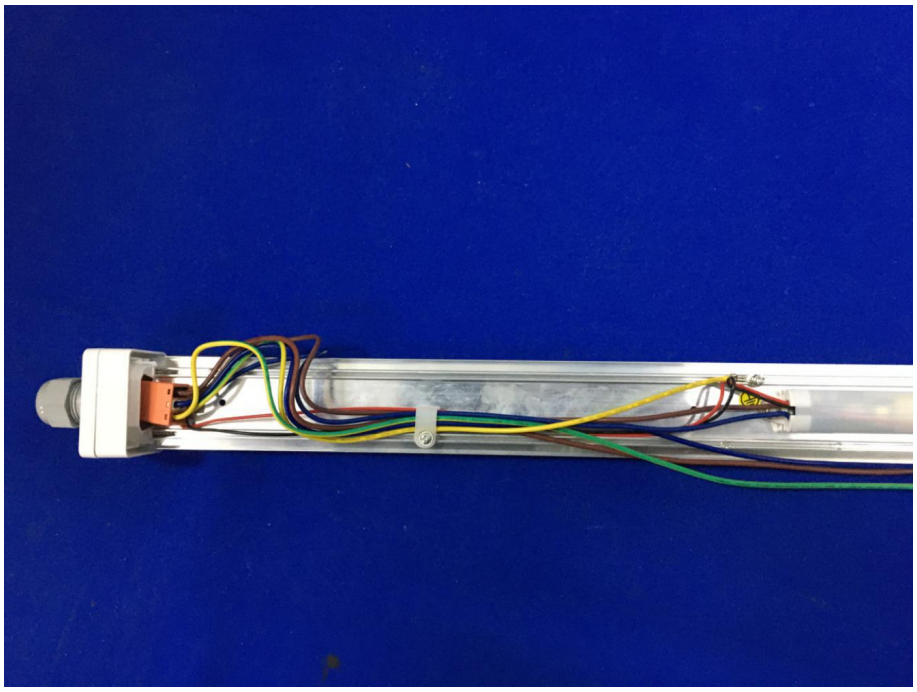

Figure 9

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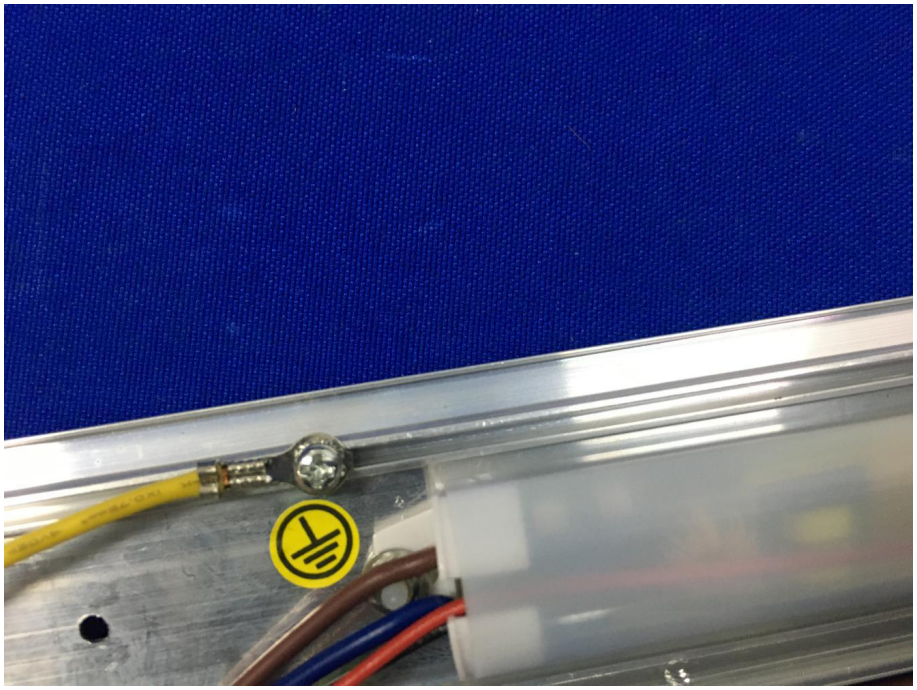

Figure 10

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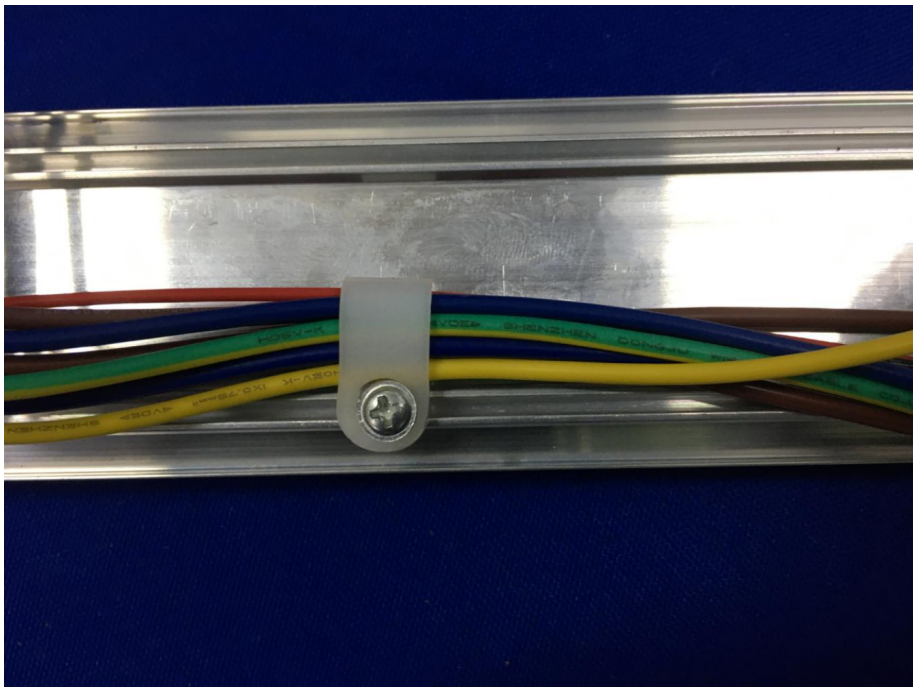

Figure 11

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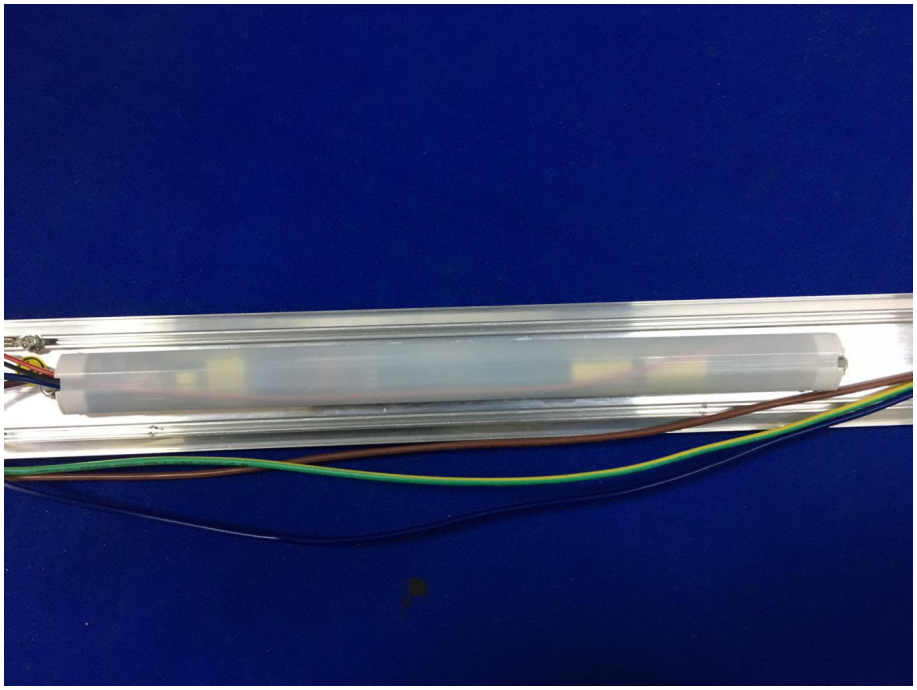

Figure 12

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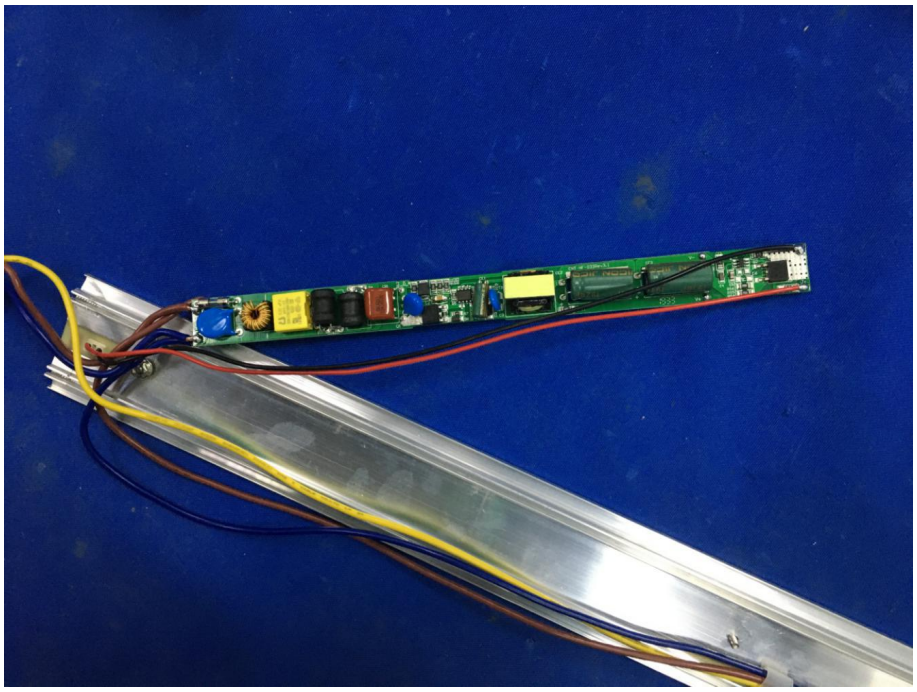

Figure 13

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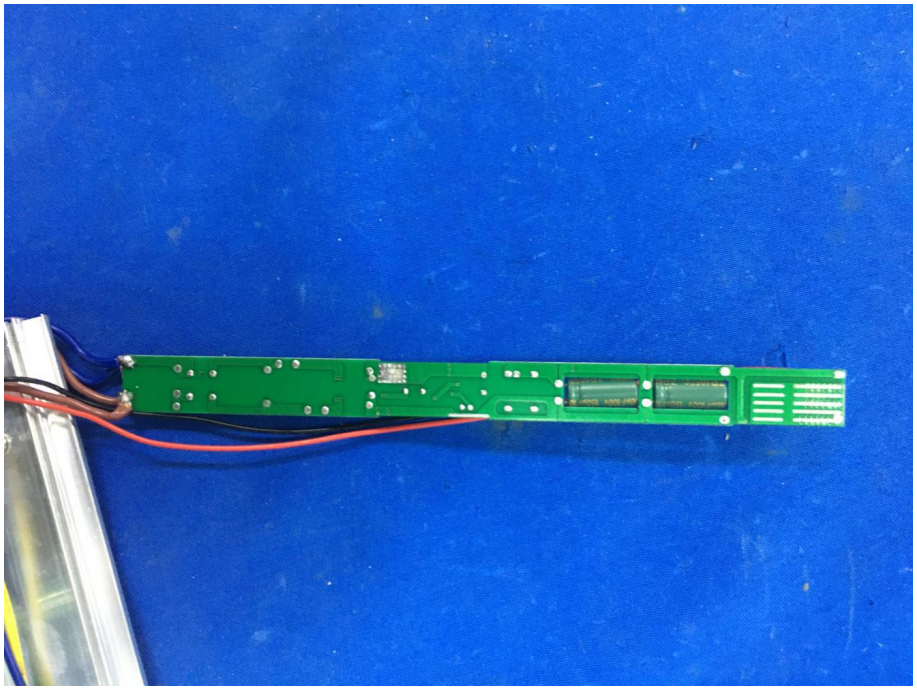

Figure 14

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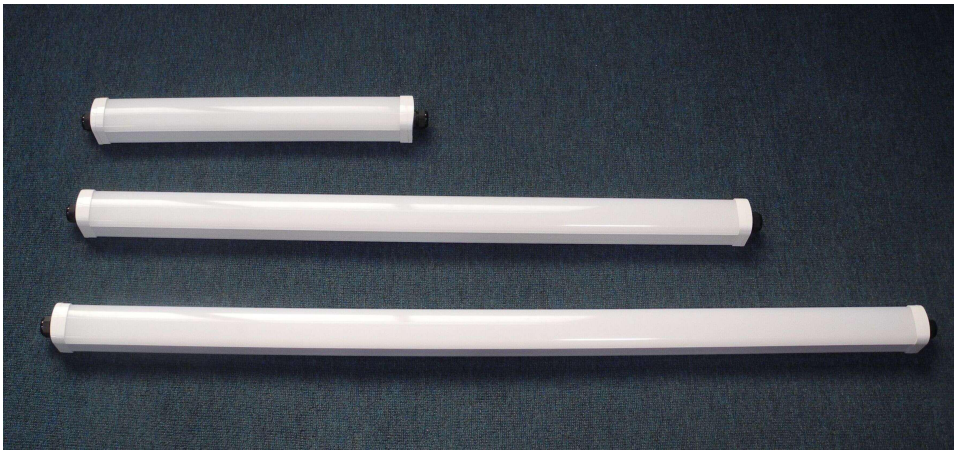

Figure 15

----------End of Test Report----------

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