



TEST REPORT
IEC 60598-2-24
Luminaires
Part 2: Particular requirements
Section 24: Luminaires with limited surface temperature

Report Number.....: LCS180917034BS
Date of issue.....: October 22, 2018
Total number of pages..... 49 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, Guangming New District, Shenzhen, Guangdong Province, China.

Test specification:
Standard..... : IEC 60598-2-24:2013 used in conjunction with IEC 60598-1:2014+A1:2017
Test procedure.....: Type Test
Non-standard test method.....: N/A

Test Report Form No.....: IEC60598_2_24G
Test Report Form(s) Originator.....: Intertek Semko AB
Master TRF.....: 2018-04

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TRF No. IEC60598_2_24F

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Test item description.....:	LED Tri-Proof Light	
Trade Mark.....:		
Manufacturer.....:	Fulton Science and Technology Lighting Co., Ltd.	
Address.....:	7F, Building 17, Area C, Liantang Industrial Town, Shangcun Community, Gongming, Guangming New District, Shenzhen, Guangdong Province, China.	
Model/Type reference.....:	See Model List On Page 5	
Ratings.....:	See Model List On Page 5	
<input checked="" type="checkbox"/> Testing Laboratory:		
Testing location/ address.....:	Shenzhen Southern LCS Compliance Testing Laboratory Ltd. B Area, 1-2F, Building B, Zhongyu Green High-tech Industrial Park, Wenge Road, Heshuikou, Gongming Street, Guangming New District, Shenzhen, China	
Tested by (name, function, signature).....:	Lisa Zeng (Engineer)	
Check by (name, function, signature).....:	Eko Yang (Director)	
Approved by (name, function, signature):	Jesse Liu (Manager)	
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 60598-2-24:2013 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: 5 pages of photo documentation.		
Summary of testing:		
Tests performed (name of test and test clause):	Testing location:	
IEC 60598-2-24:2013	Shenzhen Southern LCS Compliance Testing Laboratory Ltd.	
IEC 60598-1:2014+A1:2017	B Area, 1-2F, Building B, Zhongyu Green High-tech Industrial Park, Wenge Road, Heshuikou, Gongming Street, Guangming New District, Shenzhen, China	
IEC 62471:2006		
IEC TR 62778:2014		
IEC 62031:2008+A1:2012+A2:2014		
Summary of compliance with National Differences:		
List of countries addressed		
<input checked="" type="checkbox"/> The product fulfils the requirements of Germany and European Group differences		
EN 60598-2-24:2013; EN 60598-1:2015+A1:2018;		
EN 62471:2008; EN 62493:2015;		
EN 62031:2008+A1:2013+A2:2015		

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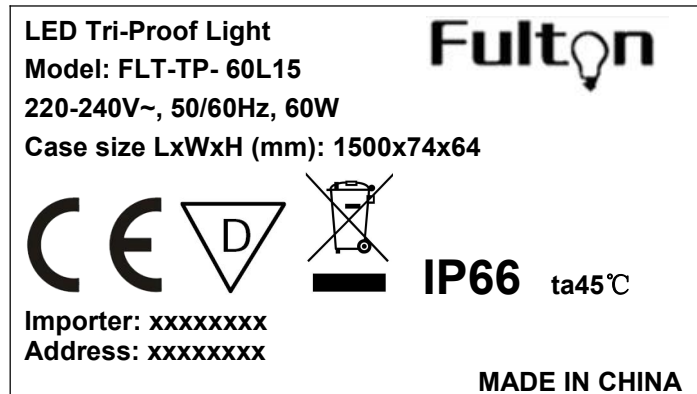
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Copy of marking plate:

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.



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

Remarks:

1. Representative markings of FLT-TP- 60L15, 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.



Test item particulars..... :									
Classification of installation and use.....:	Fixed Luminaires								
Supply Connection.....:	AC Inlet								
Protection Class.....:	Class I								
Degree of Protection..... :	IP66								
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..... :	September 20, 2018								
Date (s) of performance of tests..... :	September 20, 2018 - October 16, 2018								
General remarks:									
<p>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. "(See appended table)" refers to a table appended to the report. Clause numbers between brackets refer to clauses in IEC/EN 60598-1.</p> <p>Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.</p> <p>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.</p> <p style="text-align: center;">Modified Information</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Version</th> <th>Report No.</th> <th>Revision Data</th> <th>Summary</th> </tr> </thead> <tbody> <tr> <td>V1.0</td> <td>LCS180917033BS</td> <td>/</td> <td>Original Version</td> </tr> </tbody> </table>		Version	Report No.	Revision Data	Summary	V1.0	LCS180917033BS	/	Original Version
Version	Report No.	Revision Data	Summary						
V1.0	LCS180917033BS	/	Original Version						
Manufacturer's Declaration per sub-clause 4.2.5 of IEC/EN 60598-1:									
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.....:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable								
When differences exist; they shall be identified in the General product information section.									
Name and address of factory (ies)..... : Same as manufacturer									

TRF No. IEC60598_2_24G

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**General product information:**

- All models have similar appearance except size and power are difference.
- Unless otherwise specified, the model FLT-TP- 60L15 was chosen as representative model to perform all test.

Model List:

Model	Rating	Case size LxWxH (mm)
FLT-TP- 60L15	220-240V~, 50/60Hz, 60W, IP66, ta.45°C, Class I	1500x74x64
FLT-TP- 50L15	220-240V~, 50/60Hz, 50W, IP66, ta.45°C, Class I	1500x74x64
FLT-TP- 40L15	220-240V~, 50/60Hz, 40W, IP66, ta.45°C, Class I	1500x74x64
FLT-TP- 30L15	220-240V~, 50/60Hz, 30W, IP66, ta.45°C, Class I	1500x74x64
FLT-TP- 40L12	220-240V~, 50/60Hz, 40W, IP66, ta.45°C, Class I	1200x74x64
FLT-TP- 30L12	220-240V~, 50/60Hz, 30W, IP66, ta.45°C, Class I	1200x74x64
FLT-TP- 20L6	220-240V~, 50/60Hz, 20W, IP66, ta.45°C, Class I	600x74x64
FLT-TP- 18L6	220-240V~, 50/60Hz, 18W, IP66, ta.45°C, Class I	600x74x64

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict

24.3 (0)	GENERAL TEST REQUIREMENTS		P
24.3 (0.1)	Information for luminaire design considered..... :	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Lamp standard:	—
24.3 (0.3)	More sections applicable..... :	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Section/s:	—
24.3 (0.5)	Components	(see Annex 1)	—
24.3 (0.7)	Information for luminaire design in light sources standards		—
24.3 (0.7.2)	Light source safety standard		—
	Luminaire design in the light source safety standard		P

24.5 (2)	CLASSIFICATION		P
24.5 (2.2)	Type of protection	Class I	P
24.5 (2.3)	Degree of protection..... :	IP66	P
24.5 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces..... :	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
24.5 (2.5)	Luminaire for normal use	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Luminaire for rough service	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
24.5 (-)	a) Luminaire where no unusual accumulation of dust is expected	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	b) Luminaire where an accumulation of non-conductive dust may be expected	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	c) Luminaire where an accumulation of conductive dust may be expected	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—

24.6 (3)	MARKING		P
24.6 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
24.6 (3.3)	Additional information		P
	Language of instructions	English	P
24.6 (3.3.1)	Combination luminaires		N/A
24.6 (3.3.2)	Nominal frequency in Hz	50/60Hz	P
24.6 (3.3.3)	Operating temperature	ta.45°C	P
24.6 (3.3.4)	Symbol or warning notice		P
24.6 (3.3.5)	Wiring diagram	See manual	P

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
24.6 (3.3.6)	Special conditions		N/A
24.6 (3.3.7)	Metal halide lamp luminaire – warning		N/A
24.6 (3.3.8)	Limitation for semi-luminaires		N/A
24.6 (3.3.9)	Power factor and supply current		N/A
24.6 (3.3.10)	Suitability for use indoors	IP66 suitability for use indoors and outdoors	P
24.6 (3.3.11)	Luminaires with remote control		N/A
24.6 (3.3.12)	Clip-mounted luminaire – warning		N/A
24.6 (3.3.13)	Specifications of protective shields		N/A
24.6 (3.3.14)	Symbol for nature of supply	~	P
24.6 (3.3.15)	Rated current of socket outlet		N/A
24.6 (3.3.16)	Rough service luminaire		N/A
24.6 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments		P
24.6 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A
24.6 (3.3.19)	Protective conductor current in instruction if applicable		N/A
24.6 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
24.6 (3.3.21)	Non replaceable and non-user replaceable light sources information provided	Non-user replaceable	P
	Cautionary symbol		P
24.6 (3.3.22)	Controllable luminaires, classification of insulation provided		P
24.6 (3.3.23)	Luminaire without controlgear provided with necessary information for selection of appropriate component		N/A
24.6 (3.3.24)	If not supplied with terminal block, information on the packaging		N/A
24.6 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P


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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
	Label attached		P
24.6.1 (-)	Symbol for luminaire with limited surface temp.		P
	Marking visible		P
24.6.2 (-)	Classification of the luminaire according 24.5 in manufacturers literature		P

24.7(4)	CONSTRUCTION		P
24.7 (4.2)	Components replaceable without difficulty		P
24.7 (4.3)	Wireways smooth and free from sharp edges		P
24.7 (4.4)	Lampholders		N/A
24.7 (4.4.1)	Integral lampholder		N/A
24.7 (4.4.2)	Wiring connection		N/A
24.7 (4.4.3)	Lampholder for end-to-end mounting		N/A
*24.7 (4.4.4)	Positioning		N/A
	- pressure test (N)		—
	After test the lampholder comply with relevant standard sheets and show no damage		N/A
	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
24.7 (4.4.5)	Peak pulse voltage		N/A
24.7 (4.4.6)	Centre contact		N/A
24.7 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A
24.7 (4.4.8)	Lamp connectors		N/A
24.7 (4.4.9)	Caps and bases correctly used		N/A
24.7 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N/A
24.7 (4.5)	Starter holders		N/A
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
24.7 (4.6)	Terminal blocks		P
	Tails		P
	Unsecured blocks		N/A
24.7 (4.7)	Terminals and supply connections		P
24.7 (4.7.1)	Contact to metal parts		P
24.7 (4.7.2)	Test 8 mm live conductor		P
	Test 8 mm earth conductor		P
24.7 (4.7.3)	Terminals for supply conductors		P
24.7 (4.7.3.1)	Welded method and material		P
	- stranded or solid conductor		P
	- spot welding		P
	- welding between wires		P
	- Type Z attachment		N/A
	- mechanical test according to 15.6.2		N/A
	- electrical test according to 15.6.3		N/A
	- heat test according to 15.6.3.2.3 and 15.6.3.2.4		N/A
24.7 (4.7.4)	Terminals other than supply connection		N/A
24.7 (4.7.5)	Heat-resistant wiring/sleeves		N/A
24.7 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A
24.7 (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
24.7 (4.9)	Insulating lining and sleeves		P
24.7 (4.9.1)	Retainment		P
	Method of fixing.....:		N/A
24.7 (4.9.2)	Insulated linings and sleeves:		P
	Resistant to a temperature > 20 °C to the wire temperature or		N/A
	a) & c) Insulation resistance and electric strength		N/A

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
	b) Ageing test. Temperature (°C).....:		N/A
24.7 (4.10)	Double or reinforced insulation		N/A
24.7 (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
24.7 (4.10.2)	Assembly gaps:		N/A
	- not coincidental		N/A
	- no straight access with test probe		N/A
24.7 (4.10.3)	Retention 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
24.7 (4.10.4)	Protective impedance device		N/A
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor		N/A
	Y1 or Y2 capacitors comply with IEC 60384-14		N/A
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A
24.7 (4.11)	Electrical connections and current-carrying parts		P
24.7 (4.11.1)	Contact pressure		P
24.7 (4.11.2)	Screws:		P
	- self-tapping screws		P
	- thread-cutting screws		N/A
24.7 (4.11.3)	Screw locking:		P
	- spring washer		P
	- rivets		N/A

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
24.7 (4.11.4)	Material of current-carrying parts		P
24.7 (4.11.5)	No contact to wood or mounting surface		P
24.7 (4.11.6)	Electro-mechanical contact systems		N/A
24.7 (4.12)	Screws and connections (mechanical) and glands		P
24.7 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N/A
	Torque test: torque (Nm); part..... :	Fixed enclosure: 0,8Nm	P
	Torque test: torque (Nm); part..... :	Fixed LED driver: 0,6Nm	P
	Torque test: torque (Nm); part..... :		N/A
24.7 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
*24.7 (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
24.7 (4.12.5)	Screwed glands; force (Nm)..... :		P
24.7 (4.13)	Mechanical strength		P
24.7 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm)..... :		N/A
	- other parts; energy (Nm)..... :	0,7Nm, no damage	P
	1) live parts		P
	2) linings		P
	3) protection		P
	4) covers		P
24.7 (4.13.3)	Straight test finger		P
*24.7 (4.13.4)	Rough service luminaires		N/A
	- IP54 or higher		N/A
	a) fixed		N/A

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
	b) hand-held		N/A
	c) delivered with a stand		N/A
	d) for temporary installations and suitable for mounting on a stand		N/A
24.7 (4.13.6)	Tumbling barrel		N/A
24.7 (4.14)	Suspensions, fixings and means of adjusting		P
24.7 (4.14.1)	Mechanical load:		P
	A) four times the weight		P
	B) torque 2,5 Nm		P
	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
24.7 (4.14.2)	Load to flexible cables		N/A
	Mass (kg)		—
	Stress in conductors (N/mm ²)		N/A
	Mass (kg) of semi-luminaire		N/A
	Bending moment (Nm) of semi-luminaire		N/A
24.7 (4.14.3)	Adjusting devices:		N/A
	- flexing test; number of cycles..... :		N/A
	- strands broken..... :		N/A
	- electric strength test afterwards		N/A
24.7 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
24.7 (4.14.5)	Guide pulleys		N/A
24.7 (4.14.6)	Strain on socket-outlets		N/A
24.7 (4.15)	Flammable materials		P

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
	- glow- wire test 650°C..... :	See Test Table 24.16 (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		N/A
	- thermal protection		N/A
	- electronic circuits exempted		N/A
24.7 (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
24.7 (4.16)	Luminaires for mounting on normally flammable surfaces		P
	No lamp control gear..... :	(compliance with Section 12)	P
	Provided with adaptor for a track meet the requirements for direct mounting on normally flammable surfaces		N/A
24.7 (4.16.1)	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
24.7 (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
24.7 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N/A
24.7 (4.17)	Drain holes		N/A
	Clearance at least 5 mm		N/A
24.7 (4.18)	Resistance to corrosion		P
24.7 (4.18.1)	- rust-resistance		P
*24.7 (4.18.2)	- season cracking in copper		N/A

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
24.7 (4.18.3)	- corrosion of aluminium		P
24.7 (4.19)	Ignitors compatible with ballast		N/A
*24.7 (4.20)	Rough service vibration		N/A
24.7 (4.21)	Protective shield		N/A
24.7 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A
	Shield of glass if tungsten halogen lamps		N/A
24.7 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
24.7 (4.21.3)	No direct path		N/A
24.7 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment.....:	See Test Table 24.16 (13.3.2)	N/A
24.7 (4.22)	Attachments to lamps not cause overheating or damage		N/A
24.7 (4.23)	Semi-luminaires comply Class II		N/A
24.7 (4.24)	Photobiological hazards		P
*24.7 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N/A
24.7 (4.24.2)	Retinal blue light hazard		P
	Class of risk group assessed according to IEC/TR 62778		—
	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
24.7 (4.25)	Mechanical hazard		P
	No sharp point or edges		P

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
*24.7 (4.26)	Short-circuit protection		N/A
*24.7 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N/A
*24.7 (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
24.7 (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
24.7 (4.28)	Fixing of thermal sensing control		N/A
	Not plug-in or easily replaceable type		N/A
	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
24.7 (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
24.7 (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
24.7 (4.31)	Insulation between circuits		N/A

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3		N/A
	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
24.7 (4.31.1)	SELV circuits		N/A
	Used SELV source		N/A
	Voltage \leq 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
	Plugs and socket-outlets does not have protective conductor contact		N/A
24.7 (4.31.2)	FELV circuits		N/A
	Used FELV source		N/A
	Voltage \leq 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
24.7 (4.31.3)	Other circuits		N/A

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
	Other circuits insulated from accessible parts according Table X.1		N/A
	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		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
24.7 (4.32)	Overvoltage protective devices		N/A
	Comply with IEC 61643-11		N/A
	External to controlgear and connected to earth:		N/A
	- only in fixed luminaires		N/A
	- only connected to protective earth		N/A
24.7.1 (-)	Degree of protection		P
	IP4X at least	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
	IP5X if presence of dust	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
	IP6X if presence of conductive dust	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	P
	At least IP 5X or IP6X for certain locations according IEC 60364-4-42		P
24.7.2 (-)	Applicable surfaces comply with requirements of horizontal surfaces		P
	Vertical surfaces not complying with spacing requirements in 24.13 comply with the limits for horizontal surfaces		P

24.8 (11)	CREEPAGE DISTANCES AND CLEARANCES		P
24.8 (11.2)	Creepage distances and clearances..... :	See Table 24.8 (11.2)	P
	Impulse withstand category (Normal category II) (Category III Annex U, Table U.1)	Category II <input checked="" type="checkbox"/> Category III <input type="checkbox"/>	—

24.9 (7)	PROVISION FOR EARTHING		P
24.9 (7.2.1 + 7.2.3)	Accessible metal parts		P

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
	Metal parts in contact with supporting surface		P
	Resistance < 0,5 Ω.....: :	0,015Ω	P
	Self-tapping screws used		N/A
	Thread-forming screws		P
	Thread-forming screw used in a groove		P
	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
24.9 (7.2.2 + 7.2.3)	Earth continuity in joints, etc.		P
24.9 (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
24.9 (7.2.5)	Earth terminal integral part of connector socket		N/A
24.9 (7.2.6)	Earth terminal adjacent to mains terminals		P
24.9 (7.2.7)	Electrolytic corrosion of the earth terminal		P
24.9 (7.2.8)	Material of earth terminal		P
	Contact surface bare metal		P
24.9 (7.2.10)	Class II luminaire for looping-in		N/A
	Double or reinforced insulation to functional earth		N/A
24.9 (7.2.11)	Earthing core coloured green-yellow		P
	Length of earth conductor		P

24.10 (14)	TERMINALS AND ELECTRICAL CONNECTIONS		N/A
24.10 (14)	Screw terminals		N/A
	Separately approved; component list	(see Annex 1)	N/A
	Part of the luminaire	(see Annex 3)	N/A

24.10 (15)	TERMINALS AND ELECTRICAL CONNECTIONS		N/A
24.10 (15)	Screwless terminals and electrical connections		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	Separately approved; component list..... :	(see Annex 1)	N/A
	Part of the luminaire..... :	(see Annex 4)	N/A

24.11 (5)	EXTERNAL AND INTERNAL WIRING		P
24.11 (5.2)	Supply connection and external wiring		P
24.11 (5.2.1)	Means of connection..... :	AC Inlet	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
24.11 (5.2.2)	Type of cable..... :		N/A
	Nominal cross-sectional area (mm ²)..... :		N/A
	Cables equal to IEC 60227 or IEC 60245		N/A
24.11 (5.2.3)	Type of attachment, X, Y or Z		N/A
24.11 (5.2.5)	Type Z not connected to screws		N/A
24.11 (5.2.6)	Cable entries:		N/A
	- suitable for introduction		N/A
	- adequate degree of protection		N/A
24.11 (5.2.7)	Cable entries through rigid material have rounded edges		N/A
24.11 (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
24.11 (5.2.9)	Locking of screwed bushings		N/A
24.11 (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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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
	- no tying of cables into knots etc.		N/A
	- insulating material or lining		N/A
24.11 (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
24.11 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		N/A
24.11 (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
24.11 (5.2.11)	External wiring passing into luminaire		N/A
24.11 (5.2.12)	Looping-in terminals		N/A
24.11 (5.2.13)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		N/A
24.11 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
24.11 (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
24.11 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
24.11 (5.2.18)	Used plug in accordance with		N/A
	- IEC 60083		N/A
	- other standard		N/A
24.11 (5.3)	Internal wiring		P
24.11 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		N/A
	- not delivered/ mounting instruction		N/A
	- factory assembled		N/A
	- socket outlet loaded (A)..... :		N/A
	- temperatures..... :	(see Annex 2)	N/A
	Green- yellow for earth only		P
24.11 (5.3.1.1)	Internal wiring connected directly to fixed wiring		N/A
	Cross-sectional area (mm ²)..... :		N/A
	Insulation thickness		N/A
	Extra insulation added where necessary		N/A
24.11 (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
24.11 (5.3.1.3)	Double or reinforced insulation for class II		N/A
24.11 (5.3.1.4)	Conductors without insulation		N/A
24.11 (5.3.1.5)	SELV current-carrying parts		P
24.11 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
24.11 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N/A
	Joints, raising/lowering devices		N/A
	Telescopic tubes etc.		N/A
	No twisting over 360°		P
24.11 (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
24.11 (5.3.4)	Joints and junctions effectively insulated		N/A
24.11 (5.3.5)	Strain on internal wiring		N/A
24.11 (5.3.6)	Wire carriers		N/A
24.11 (5.3.7)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		P
24.11 (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

24.12 (8)	PROTECTION AGAINST ELECTRIC SHOCK		P
24.12 (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

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
	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		N/A
	Double-ended tungsten filament lamp		N/A
	Insulation lacquer not reliable		N/A
	Double-ended high pressure discharge lamp		N/A
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
24.12 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
24.12 (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
24.12 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N/A
24.12 (8.2.3.c)	SELV circuits with exposed current carrying parts:		N/A
	Ordinary luminaire:		N/A
	- voltage under load (V)..... :		N/A
	- no-load voltage (V)..... :		N/A
	- touch current if applicable (mA) :		N/A
	One conductive part insulated if required		N/A
	Other than ordinary luminaire:		N/A
	- nominal voltage (V) :		N/A
	Class III luminaire only for connection to SELV		N/A
	Class III luminaire not provided with means for protective earthing		N/A
24.12 (8.2.4)	Portable luminaire have protection independent of supporting surface		N/A

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
24.12 (8.2.5)	Compliance with the standard test finger or relevant probe		P
24.12 (8.2.6)	Covers reliably secured		P
24.12 (8.2.7)	Luminaire other than below with capacitor > 0,5 μF not exceed 50 V 1 min after disconnection		P
	Portable luminaire with capacitor > 0,1 μF (0.25) not exceed 34 V 1 s after disconnection		N/A
	Other luminaires with capacitor > 0,1 μF (0.25) with plug and track adaptors not exceed 60 V 5 s after disconnection		N/A

24.13 (12)	ENDURANCE TEST AND THERMAL TEST		P
24.13 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 24.14		—
24.13 (12.3)	Endurance test:		P
	- mounting- position..... :	As normal used	—
	- test temperature (°C)..... :	45°C+10°C	—
	- total duration (h)..... :	240h	—
	- supply voltage: Un factor; calculated voltage (V)... :	1,1X240V	—
	- lamp used..... :		—
24.13 (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
24.13 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
24.13 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	P
24.13 (12.6)	Thermal test (failed lamp control gear condition):		N/A
24.13 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A)		—

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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
24.13 (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
24.13 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N/A
24.13 (12.7.1)	Luminaire without temperature sensing control		N/A
24.13 (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 24.16 (13.2.1)	N/A

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
24.13 (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 24.16 (13.2.1)	N/A
24.13 (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 <input type="checkbox"/> No <input type="checkbox"/>	—
	- manual reset cut-out.....:	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- auto reset cut-out.....:	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- case of abnormal conditions.....:		—
	- highest measured temperature of fixing point/exposed part (°C):.....:		—
	Ball-pressure test.....:	See Table 24.16 (13.2.1)	N/A
24.13 (-)	Temperature limit for vertical surfaces with gap < 30 mm	(see Annex 2)	P
24.13.1 (-)	Special temperature limits – normal operation	(see Annex 2)	P
24.13.2 (-)	Special temperature limits – abnormal operation	(see Annex 2)	P
24.13.3 (-)	Special temperature limits – fault conditions	(see Annex 2)	P

24.14 (9)	RESISTANCE TO DUST AND MOISTURE		P
24.14 (-)	The order of tests as specified in clause 24.13		P
24.14 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP.....:	IP66	—
	- mounting position during test.....:		—
	- fixing screws tightened; torque (Nm).....:		—

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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
	c.1) For luminaires without drain holes – no water entry		P
	c.2) For luminaires with drain holes – no hazardous water entry		N/A
	d) no water in watertight or pressure watertight luminaire		N/A
	e) no contact with live parts (IP 2X)		N/A
	e) no entry into enclosure (IP 3X and IP 4X)		N/A
	e) no contact with live parts through drain holes and ventilation slots (IP3X and IP4X)		N/A
	f) no trace of water on part of lamp requiring protection from splashing water		P
	g) no damage of protective shield or glass envelope		P
24.14 (9.3)	Humidity test 48 h	93%RH, 25°C, 48h	P

24.15 (10)	INSULATION RESISTANCE AND ELECTRIC STRENGTH		P
24.15 (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
	- 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

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
	Other than SELV		P
	- between live parts of different polarity..... :	LED driver CE approved	P
	- between live parts and mounting surface..... :	100M Ω , limit: 2 M Ω	P
	- between live parts and metal parts..... :	100M Ω , limit: 2 M Ω	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
24.15 (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..... :	LED driver CE approved	P
	- between live parts and mounting surface..... :	1480Vac, no breakdown	P
	- between live parts and metal parts..... :	1480Vac, no breakdown	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

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict

24.15 (10.3)	Touch current or protective conductor current (mA):	0,3mA, limit: 3,5mA	P
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24.16 (13)	RESISTANCE TO HEAT, FIRE AND TRACKING		P
24.16 (13.2.1)	Ball-pressure test..... :	See Test Table 24.16 (13.2.1)	P
24.16 (13.3.1)	Needle-flame test (10 s)..... :	See Test Table 24.16 (13.3.1)	P
24.16 (13.3.2)	Glow-wire test (650°C)..... :	See Test Table 24.16 (13.3.2)	P
*24.16 (13.4)	Proof tracking test (IEC 60112)..... :	See Test Table 24.16 (13.4)	N/A

24.8 (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						
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			

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IEC 60598-2-24			
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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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict

24.8 (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

24.16 (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	--	78°C		1,0mm	
Translucent cover	--	83°C		1,2mm	
Terminal block	--	125°C		0,9mm	
Supplementary information:--					

24.16 (13.3.1)	TABLE: Needle-flame test (IEC 60695-11-5)				P
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Terminal block	--	10s	No	5,1s	P
Supplementary information:--					

24.16 (13.3.2)	TABLE: Glow-wire test (IEC 60695-2-11)				P
Glow wire temperature				650°C	—
Object/ Part No./ Material	Manufacturer/ trademark		Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Plastic enclosure	--		30s	No	0s
Translucent cover	--		30s	No	0s
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



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Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:--

*24.16 (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⁾
Input wire of LED driver	B	Dongguan Nistar Transmitting Technology Co. Inc.	H07V-K	450/750V 3 x 1,5 mm ²	DIN EN 50525-2-31	VDE 40009152
Input wire of LED driver	B	DONGGUAN HONGLIANG ELECTRIC LTD	H07V2-K	3 x 1,5 mm ²	DIN EN 50525-2-31	VDE
Internal wire	C	GONGGUAN WORLDFUL ELECTRIC WIRE CO., LTD	1332	20AWG	--	UL E317806
Internal wire	C	GONGGUAN WORLDFUL ELECTRIC WIRE CO., LTD	1332	22AWG	--	UL E317806
Internal wire	C	GONGGUAN WORLDFUL ELECTRIC WIRE CO., LTD	3135	20AWG	--	UL E317806
Plastic enclosure	C	XIAMEN HIGH-END PHOTOELECTRIC NEW MATERIAL CO LTD	GP-1250	V-0, 110°C	--	UL E355348
Translucent cover	C	SUMIKA STYRON POLYCARBONATE LTD	LD205(w)#	V-2, 80°C	--	UL E123529 Test with appliance
Terminal block	B	Dongguan Changhe Electronics Co., Ltd.	CA350-00-500	250V, T110°C	EN 60998-2-4	VDE 40021481
LED Driver	B	OSRAM	60/220-240/350D CSL	INPUT 220-240V~, 50/60Hz, 60W OUTPUT DC90-175V, Max. 0,35A	EN61347-2-13	CE
LED PCB	C	CHANGZHOU CHAOSHUN ELECTRONIC TECHNIQUE CO LTD	CS-MCPCB-150 CS-MCPCB CS-PCB	V-0, 130°C	--	UL E348435

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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

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12			P			
	Type reference.....	FLT-TP- 60L15		—			
	Lamp used.....	LED lamp		—			
	Lamp control gear used.....	60/220-240/350D CS L		—			
	Mounting position of luminaire.....	See product manual		—			
	Supply wattage (W).....	58,1W		—			
	Supply current (A).....	0,245A		—			
	Calculated power factor.....	0,987		—			
	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	10A		—			
Temperature measurements, (°C)							
Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Input wire	45°C	--	52,1	--	90	--	--
LED PCB	45°C	--	64,3	--	130	--	--
Terminal block	45°C	--	54,9	--	110	--	--
Internal wire	45°C	--	60,4	--	150	--	--
Plastic enclosure	45°C	--	53,2	--	110	--	--
Translucent cover near LED	45°C	--	58,1	--	80	--	--
tc of LED driver	45°C	--	66,7	--	75	--	--
Mounting surface	45°C	--	46,1	--	90	--	--
Supplementary information:							

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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict

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 (mm ²)..... :			—
(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
	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



IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
(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
(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

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Clause	Requirement + Test	Result - Remark	Verdict	

(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:											

	ANNEX 5: EMF test result according to IEC/EN 62493				P
4.2.d	MEASUREMENT RESULTS				P
	Measuring with “Van der Hoofden” test head				P
	EUT operation model: <input checked="" type="checkbox"/> Normal operation <input type="checkbox"/> Other operation:				P
	Voltage:	220-240V~	Frequency:	50Hz	--
	Temperature:	25°C	Humidity:	55% R.H.	--
	Location of EuT	Measuring distance (cm)	Result (F)	Limit (F)	Verdict
	FLT-TP- 60L15	50	0,06259	0,85	P

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**Attachment No.1**

IEC 60598_2_24F-ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

**ATTACHMENT TO TEST REPORT IEC 60598-2-24
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES
LUMINAIRES
PART 2: PARTICULAR REQUIREMENTS
SECTION 5: LUMINAIRES WITH LIMITED SURFACE TEMPERATURE**

Differences according to..... : EN 60598-2-24:2013 used in conjunction with
EN 60598-1:2015+A1:2018

Annex Form No..... : EU_GD_IEC60598_2_24F

Annex Form Originator..... : OVE

Master Annex Form..... : 2015-04

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	CENELEC COMMON MODIFICATIONS (EN)		P
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24.6 (3)	MARKING		P
24.6 (3.3.101)	For luminaires not supplied with terminal block: Adequate warning on the package		P

24.7 (4)	CONSTRUCTION		P
24.7 (4.11.6)	Electro-mechanical contact systems		P

24.11 (5)	EXTERNAL AND INTERNAL WIRING		P
24.11 (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
24.11 (5.2.2)	Cables equal to EN 50525		N/A
	Replace table 5.1 – Supply cord		P

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Attachment No.1

IEC 60598_2_24F-ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

24.13 (12)	ENDURANCE TESTS AND THERMAL TESTS		P
24.13 (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
(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 according 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		P
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		P
6.1	Continuous wave lamps		P
6.1.1	Exempt group		P
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)	E _s	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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Photobiological safety of lamps and lamp systems			
Clause	Requirement + Test	Result - Remark	Verdict

Table 6.1	Emission limits for risk groups of continuous wave lamps	N/A
<p>* Small source defined as one with $\alpha < 0,011$ radian. Averaging field of view at 10000 s is 0,1 radian. ** Involves evaluation of non-GLS source</p> <p>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</p>		

Table 24.7 (4.24)	Spectroradiometric measurement (IEC 62778)	--																		
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">Measurement performed on:</th> <th style="width: 50%;">Luminaire</th> </tr> <tr> <td>Model number.....</td> <td>FLT-TP- 60L15</td> </tr> <tr> <td>Test voltage (V).....</td> <td>240</td> </tr> <tr> <td>Test current (mA).....</td> <td>--</td> </tr> <tr> <td>Test frequency (Hz).....</td> <td>50</td> </tr> <tr> <td>Ambient, t (°C).....</td> <td>25.0</td> </tr> <tr> <td>Measurement distance.....</td> <td> <input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm </td> </tr> <tr> <td>Source size</td> <td> <input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small : mm </td> </tr> <tr> <td>Field of view</td> <td> <input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources) </td> </tr> </table>	Measurement performed on:	Luminaire	Model number.....	FLT-TP- 60L15	Test voltage (V).....	240	Test current (mA).....	--	Test frequency (Hz).....	50	Ambient, t (°C).....	25.0	Measurement distance.....	<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm	Source size	<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small : mm	Field of view	<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)	--
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Measurement distance.....	<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm																			
Source size	<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small : mm																			
Field of view	<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 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 •sr ¹)	0,63x10 ²	<input checked="" type="checkbox"/> RG0: <100 <input type="checkbox"/> RG1: <10000 <input type="checkbox"/> RG2: <4000000
Blue light hazard irradiance	E _B	W/m ²	--	--
Luminance	L	cd/m ²	--	--
Illuminance	E	lx	--	--

Supplementary information:



Attachment No.4

Photo Documentation

View:
Model:
FLT-TP-
60L15

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB



Figure 1

View:

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB



Figure 2

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Attachment No.4

Photo Documentation

View:

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB



Figure 3

View:

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB



Figure 4

Attachment No.4

Photo Documentation

View:

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB



Figure 5

View:

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB

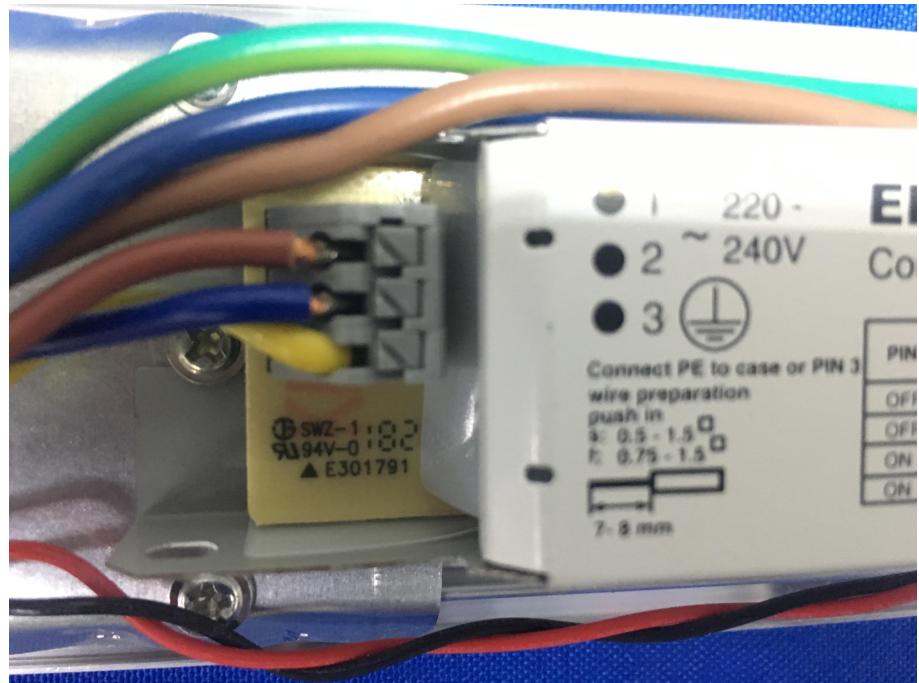


Figure 6

Attachment No.4

Photo Documentation

View:

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB

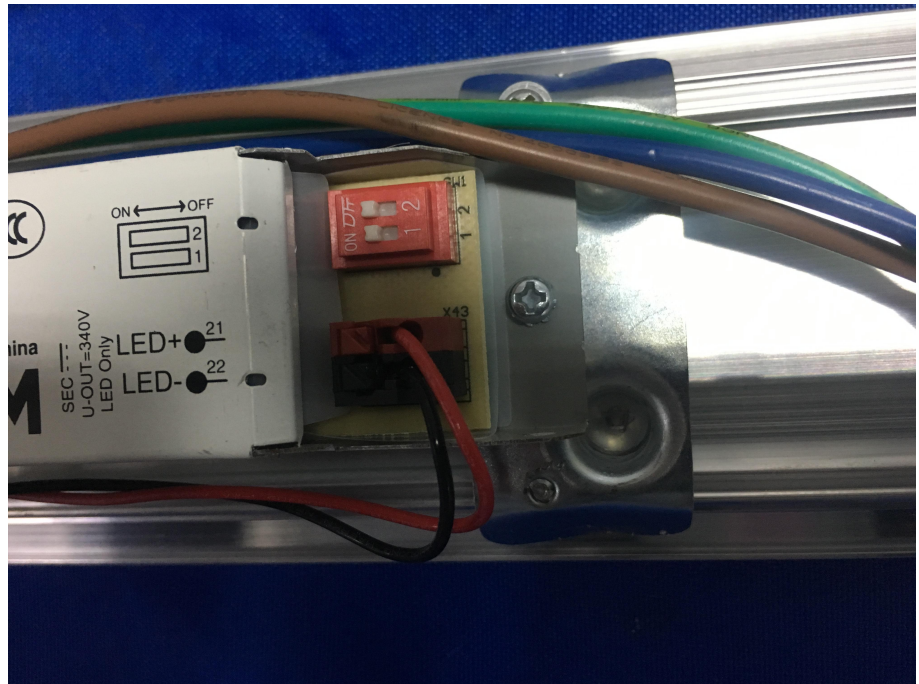


Figure 7

View:

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB

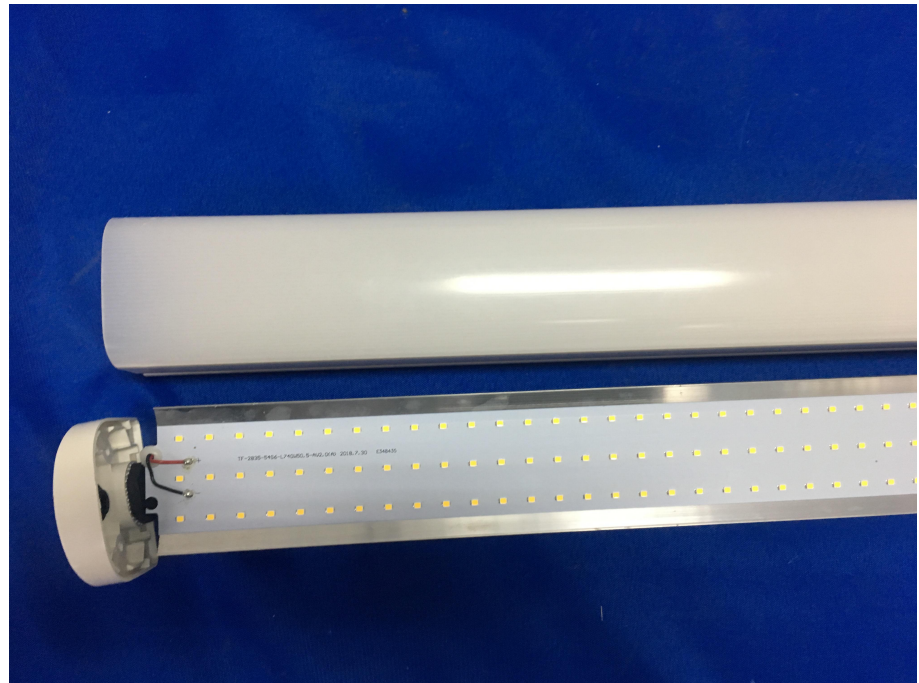


Figure 8



Attachment No.4

Photo Documentation

View:

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB



Figure 9

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

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