



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

Report Number.....: LCS181015013BS001

Date of issue.....: May 29, 2019

Total number of pages.....: 44 pages

Name of Testing Laboratory

preparing the Report.....: Shenzhen Southern LCS Compliance Testing Laboratory Ltd.

Applicant's name.....: Blinq88

Address.....: No. 8, Laocun Road – Tangtou Industrial Park – Shiyan Town –
BaoAn District – Shenzhen – China 518108

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

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TRF No. IEC60598_2_1F

Shenzhen Southern LCS Compliance Testing Laboratory Ltd.

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Test item description.....:	LED TRACK LIGHTS	
Trade Mark.....:	Blinq88	
Manufacturer.....:	Fitlight Technologies Co., LTD.	
Address.....:	5th Floor, Building A4, Hi-tech Industrial Park, No.639 Fusheng Road, Dalang Town, Dongguan City, China	
Model/Type reference.....:	See Model List On Page 5	
Ratings.....:	See Model List On Page 5	
☒ 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).....:	Rebecca Qin (Engineer)	<i>Rebecca Qin</i>
Check by (name, function, signature).....:	Eko Yang (Director)	<i>Eko Yang</i>
Approved by (name, function, signature):	Jesse Liu (Manager)	<i>Jesse Liu</i>
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: 4 pages of photo documentation.		
Summary of testing:		
Tests performed (name of test and test clause): 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	Testing location: 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	
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		

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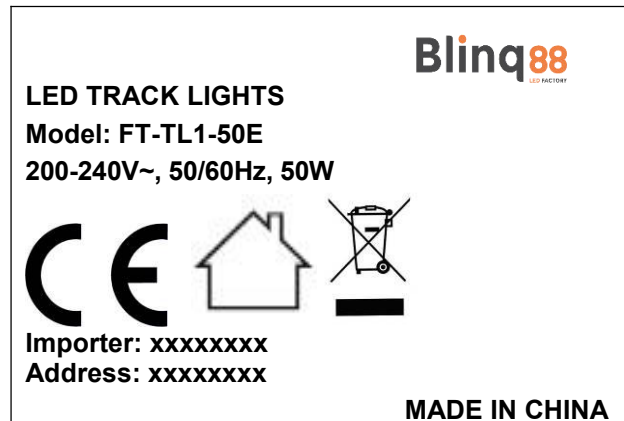
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**Copy of marking plate:**

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.

**Remarks:**

1. Representative markings of FT-TL1-50E, 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.....: Tracks													
Protection Class.....: Class I													
Degree of Protection..... : IP20													
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..... : October 15, 2018													
Date (s) of performance of tests..... : October 15, 2018 - October 27, 2018													
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. "(See appended table)" refers to a table appended to the report. 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													
<table border="1"><thead><tr><th>Version</th><th>Report No.</th><th>Revision Date</th><th>Summary</th></tr></thead><tbody><tr><td>V1.0</td><td>LCS181015013BS</td><td>/</td><td>Original Version</td></tr><tr><td>V2.0</td><td>LCS181015013BS001</td><td>2019-05-29</td><td>Modify the applicant and model</td></tr></tbody></table>		Version	Report No.	Revision Date	Summary	V1.0	LCS181015013BS	/	Original Version	V2.0	LCS181015013BS001	2019-05-29	Modify the applicant and model
Version	Report No.	Revision Date	Summary										
V1.0	LCS181015013BS	/	Original Version										
V2.0	LCS181015013BS001	2019-05-29	Modify the applicant and model										
Test report Ref. No. LCS181015013BS001, dated 2019-05-29 is not valid without the original test report Ref. No. LCS181015013BS, dated 2018-10-29.													
Manufacturer's Declaration per sub-clause 4.2.5 of IEC 60598-2:													
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 appearance except size, power and LED drivers are difference.
- Unless otherwise specified, the model FT-TL1-50E was chosen as representative model to perform all test.

Model List:

LED Module		LED Driver	
Model	Rating	Model	Rating
RBGU10	DC27-42V, 250mA, 10W	LF- GIR013YS0250H	Input: 200-240V~, 50/60Hz Output: DC27-42V, 250mA, 10W
RWGU10			
RDW30	DC27-42V, 750mA, 30W	XZ-QA30B- 420075-A	Input: 200-240V~, 50/60Hz Output: DC27-42V, 750mA, 30W
RDB30			
REB30			
REW30			
RP-W30			
RP-B30			
RBW30			
RAW35	DC27-42V, 850mA, 35W	XZ-QA40B- 420085-A	Input: 200-240V~, 50/60Hz Output: DC27-42V, 850mA, 35W
RAB35			
RDW40	DC27-42V, 950mA, 40W	XZ-QA40B- 420095-A	Input: 200-240V~, 50/60Hz Output: DC27-42V, 950mA, 40W
RDB40			
RP-W40			
RP-B40			
RBW40			
RBB40			
RDW50	DC27-42V, 1150mA, 50W	GS3120-A	Input: 200-240V~, 50/60Hz Output: DC30-40V, 1150mA, 50W
RDB50			
FT-TL1-50E			



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..... :	IP20	—
1.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces..... :	Yes ☒ No ☐	—
1.4 (2.5)	Luminaire for normal use	Yes ☒ No ☐	—
	Luminaire for rough service	Yes ☐ No ☒	—

1.5 (3)	MARKING		P
1.5 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
1.5 (3.3)	Additional information		P
	Language of instructions	English	P
1.5 (3.3.1)	Combination luminaires		N/A
1.5 (3.3.2)	Nominal frequency in Hz	50/60Hz	P
1.5 (3.3.3)	Operating temperature		P
1.5 (3.3.4)	Symbol or warning notice		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		N/A
1.5 (3.3.10)	Suitability for use indoors		P

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.5 (3.3.11)	Luminaires with remote control		N/A
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
	Cautionary symbol		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		P
	Test with hexane		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

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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
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		N/A
	Tails		N/A
	Unsecured blocks		N/A
1.6 (4.7)	Terminals and supply connections		P
1.6 (4.7.1)	Contact to metal parts		N/A
1.6 (4.7.2)	Test 8 mm live conductor		N/A
	Test 8 mm earth conductor		N/A
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

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
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
	- 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		P
1.6 (4.9.1)	Retainment		P
	Method of fixing.....:		—
1.6 (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
	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

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.11.1)	Contact pressure		P
1.6 (4.11.2)	Screws:		P
	- self-tapping screws		P
	- thread-cutting screws		N/A
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 COB PCB: 0,5Nm	P
	Torque test: torque (Nm); part.....:		N/A
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).....:		N/A
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

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Clause	Requirement + Test	Result - Remark	Verdict
	- IP54 or higher		N/A
	a) fixed		N/A
	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
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/mm ²)		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

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

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

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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
	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 ($^{\circ}\text{C}$)..... :		—
	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:		N/A
	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		P
	Used SELV source		P
	Voltage $\leq$ ELV		P
	Insulating of SELV circuits from LV supply		P
	Insulating of SELV circuits from other non SELV circuits		N/A

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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
1.6 (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
1.6 (4.31.3)	Other circuits		N/A
	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 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

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

	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).....:	AC200-240V	—
	Rated pulse voltage (kV).....:		—
	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.....:	0,015Ω	P
	Self-tapping screws used		N/A
	Thread-forming screws		P
	Thread-forming screw used in a groove		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

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

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		N/A
1.10 (5.2.1)	Means of connection.....:	Tracks	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 (mm ²).....:		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

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

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
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
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		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
1.10 (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
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

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

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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
	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 $\geq 0,5 \mu\text{F}$	0V	P

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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	—
	- test temperature (°C)..... :	35°C	—
	- total duration (h)..... :	240h	—
	- supply voltage: Un factor; calculated voltage (V)... :	1,1X240V	—
	- lamp used..... :		—
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

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IEC 60598-2-1			
Clause	Requirement + Test		Verdict
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
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).....:		—

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Ball-pressure test.....:	See Table 1.15 (13.2.1)	P
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.....:		—
	- 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.....:	IP20	—
	- 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		N/A
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		N/A
	d) i) For luminaires without drain holes – no water entry		N/A
	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)		P
	f) no entry into enclosure (IP 3X and IP 4X)		N/A

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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		N/A
	h) no damage of protective shield or glass envelope		N/A
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		P
	- between current-carrying parts of different polarity:		N/A
	- between current-carrying parts and mounting surface.....	> 100 MΩ	P
	- between current-carrying parts and metal parts of the luminaire.....	> 100 MΩ	P
	- 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.....	> 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

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Test voltage (V).....:		P
	SELV		P
	- between current-carrying parts of different polarity:		N/A
	- between current-carrying parts and mounting surface.....:	500V	P
	- between current-carrying parts and metal parts of the luminaire.....:	500V	P
	- 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	P
	- 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):	0,3mA; 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)				N/A
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							

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IEC 60598-2-1							
Clause	Requirement + Test			Result - Remark			Verdict
Required basic insulation, PTI $\geq$ 600	0,6	0,8	1,5	3	4	5,5	
Measured							
Required basic insulation, PTI $<$ 600	1,2	1,6	2,5	5	8	10	
Measured							
Required supplementary insulation PTI $\geq$ 600	-	0,8	1,5	3	4	5,5	
Measured							
Required supplementary insulation PTI $<$ 600	-	1,6	2,5	5	8	10	
Measured							
Required reinforced insulation	-	3,2	5	6	8	11	
Measured							
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
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 60598-2-1			
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~	LED driver approved with Class III parts				Pass
Current-carrying parts and accessible parts	240V~					Pass
Current-carrying parts and mounting surface	240V~					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)	
Tracks	--	75°C		1,0mm	
Supplementary information:--					

1.15 (13.3.1)	TABLE: Needle-flame test (IEC 60695-11-5)				N/A
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
--	--	--	--	--	--
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
Tracks	--	30s	No	0s	P
Any flame or glowing of the sample extinguished within 30 s of withdrawing the glow-wire, and any burning or molten drop did not ignite the underlying parts (Yes/No).....					Yes
Supplementary information:--					

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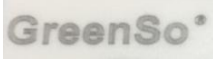
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IEC 60598-2-1					
Clause	Requirement + Test			Result - Remark	Verdict
*1.15 (13.4)	TABLE: Proof tracking test (IEC 60112)				N/A
Test voltage PTI		175 V			—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
--	--	--	--	--	--
Supplementary information:--					

ANNEX 1		TABLE: Critical components information					--
Object / part No.	Code	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾	
Input wire	B	MAINLAND ELECTRIC WIRE & CABLE CO., LTD.	H03VVH2-F	300/300V, 2X0,75mm ²	DIN EN 50525-2-11	VDE 40010355	
Earthing wire	B	MAINLAND ELECTRIC WIRE & CABLE CO., LTD.	H03VVH2-F	300/300V, 1X0,75mm ²	DIN EN 50525-2-11	VDE 40010355	
Internal wire	C	DONGGUAN WENCHANG ELECTRONIC CO., LTD.	1007	22 AWG, 80℃	--	UL E214500	
LED Driver	B		GS3120-A	Input: 200-240V~, 50/60Hz Output: DC30-40V, 1150mA, Max. 48W	EN 61347-2-13	CE	
LED Driver	B	Shenzhen Ledfriend Optoelectronics Co., Ltd.	LF-GIR013YS025 0H	Input: 200-240V~, 50/60Hz Output: DC27-42V, 250mA, 10W	EN 61347-2-13	CE	
LED Driver	B	Shenzhen Ledfriend Optoelectronics Co., Ltd.	LF-GIR013YS035 0H	Input: 200-240V~, 50/60Hz Output: DC27-42V, 350mA, 15W	EN 61347-2-13	CE	
LED Driver	B	Hunan resonance electronics co., Ltd.	XZ-QA20B-420050-A	Input: 200-240V~, 50/60Hz Output: DC27-42V, 500mA, 20W	EN 61347-2-13	CE	
LED Driver	B	Hunan resonance electronics co., Ltd.	XZ-QA30B-420060-A	Input: 200-240V~, 50/60Hz Output: DC27-42V, 600mA, 25W	EN 61347-2-13	CE	
LED Driver	B	Hunan resonance electronics co., Ltd.	XZ-QA30B-420075-A	Input: 200-240V~, 50/60Hz Output: DC27-42V, 750mA, 30W	EN 61347-2-13	CE	

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IEC 60598-2-1						
Clause	Requirement + Test			Result - Remark		Verdict
LED Driver	B	Hunan resonance electronics co., Ltd.	XZ-QA40B-420085-A	Input: 200-240V~, 50/60Hz Output: DC27-42V, 850mA, 35W	EN 61347-2-13	CE
LED Driver	B	Hunan resonance electronics co., Ltd.	XZ-QA40B-420095-A	Input: 200-240V~, 50/60Hz Output: DC27-42V, 950mA, 40W	EN 61347-2-13	CE
LED Driver	B	Hunan resonance electronics co., Ltd.	XZ-QA40B-420100-A	Input: 200-240V~, 50/60Hz Output: DC27-42V, 1000mA, 45W	EN 61347-2-13	CE
COB	C	DERUNDA OPTOELECTRONICS	DRD-045WC6A4-XX	VF: 34-38V IF: 1200mA	--	Test with appliance

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.....:	FT-TL1-50E	—
	Lamp used.....:	LED lamp	—
	Lamp control gear used.....:	GS3120-A	—
	Mounting position of luminaire.....:	See product manual	—
	Supply wattage (W).....:	47,6W	—
	Supply current (A).....:	0,206A	—
	Calculated power factor.....:	0,963	—
	Table: measured temperatures corrected for $t_a = 25\text{ }^{\circ}\text{C}$:		P
	- abnormal operating mode.....:		—
	- test 1: rated voltage.....:		—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage.....:	1,06*240V	—
	- 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.....:		—

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IEC 60598-2-1							
Clause	Requirement + Test				Result - Remark		Verdict
	Through wiring or looping-in wiring loaded by a current of A during the test :						—
Temperature measurements, (°C)							
Part	Clause 12.4 – normal				Clause 12.5 – abnormal		
	test 1	test 2	test 3	limit	test 4	limit	
Input wire	--	34,7	--	90	--	--	
COB PCB	--	58,6	--	Ref.	--	--	
Internal wire	--	52,1	--	80	--	--	
tc of LED Driver	--	63,7	--	70	--	--	
Mounting surface	--	29,6	--	90	--	--	
Ambient	--	25,0	--	--	--	--	
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 (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

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

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

(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).....:									

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IEC 60598-2-1										
Clause	Requirement + Test					Result - Remark				Verdict
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: ☒ Normal operation ☐ Other operation:				P
	Voltage:	AC200-240V	Frequency:	50Hz	--
	Temperature:	25°C	Humidity:	55% R.H.	--
	Location of EuT	Measuring distance (cm)	Result (F)	Limit (F)	Verdict
	FT-TL1-50E	50	0,05987	0,85	P

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Attachment No.1

IEC 60598_2_1D-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			
Annex Form No..... : EU_GD_IEC60598_2_1D Annex Form Originator..... : OVE Master Annex Form..... : 2015-04			
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	CENELEC COMMON MODIFICATIONS (EN)	P
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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	P
1.6 (4.11.6)	Electro-mechanical contact systems	P

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

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Attachment No.1

IEC 60598_2_1D-ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
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
(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

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Attachment No.3

IEC/EN 62471			
Photobiological safety of lamps and lamp systems			
Clause	Requirement + Test	Result - Remark	Verdict
6.1.4	Risk Group 3 (High-Risk)		N/A
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	$W \cdot m^{-2}$	0,001	-	-	-	-	-
Near UV		E _{UVA}	$W \cdot m^{-2}$	0,33	-	-	-	-	-
Blue light	B(λ)	L _B	$W \cdot m^{-2} \cdot sr^{-1}$	100	-	10000	-	4000000	-
Blue light, small source	B(λ)	E _B	$W \cdot m^{-2}$	0,01*	-	1,0	-	400	-
Retinal thermal	R(λ)	L _R	$W \cdot m^{-2} \cdot sr^{-1}$	28000/ α	-	28000/ α	-	71000/ α	-
Retinal thermal, weak visual stimulus**	R(λ)	L _{IR}	$W \cdot m^{-2} \cdot sr^{-1}$	545000 0,0017 $\leq \alpha \leq$ 0,011	-	-	-	-	-
				6000/ α 0,011 $\leq$ $\alpha \leq 0.1$	-	-	-	-	-
IR radiation, eye		E _{IR}	$W \cdot m^{-2}$	100	-	570	-	3200	-

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Attachment No.3

IEC/EN 62471			
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
* 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 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.....		FT-TL1-50E		--
	Test voltage (V).....		240		--
	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/(m²•sr¹)	0,64x10²	☒ RG0: <100 ☐ RG1: <10000 ☐ RG2: <4000000
Blue light hazard irradiance		E _B	W/m²	--	--
Luminance		L	cd/m²	--	--
Illuminance		E	lx	--	--
Supplementary information:					

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Attachment No.4

Photo Documentation

View:
Model:
FT-TL1-50E

☒General
☐Front
☐Rear
☐Internal
☐Top
☐Bottom
☐PWB



Figure 1

View:

☒General
☐Front
☐Rear
☐Internal
☐Top
☐Bottom
☐PWB



Figure 2

TRF No. IEC60598_2_1F

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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

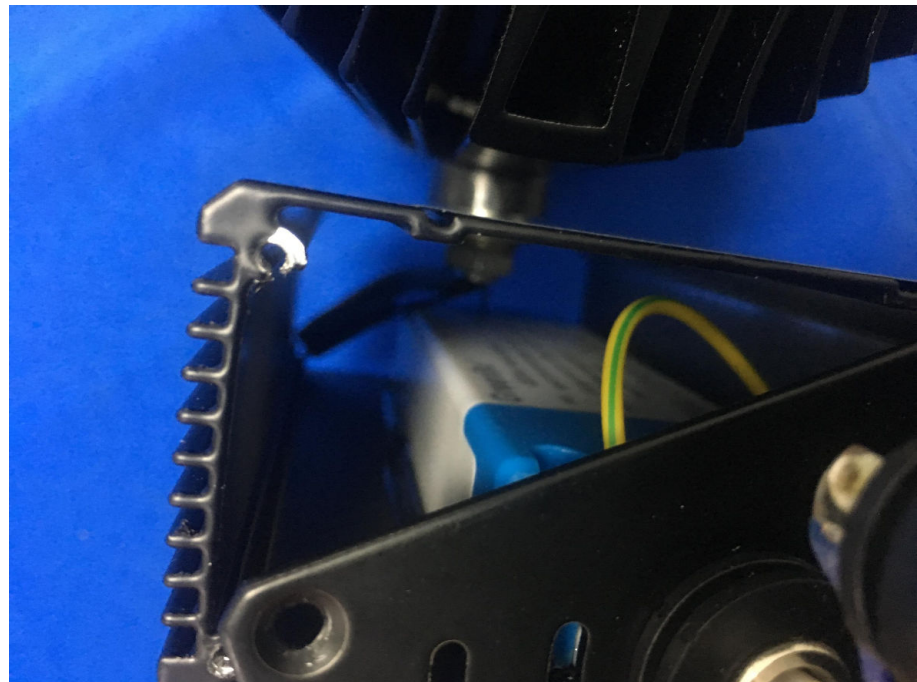


Figure 6

TRF No. IEC60598_2_1F

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Attachment No.4

Photo Documentation

View:

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



Figure 7

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

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