



TEST REPORT

IEC 60598-2-17

Luminaires

Part 2: Particular requirements:

Section Seventeen - Luminaires for stage lighting, television and film studios (outdoor and indoor)

Report Number.....: CLAB24N100552-1SR

Date of issue.....: 2024-11-08

Total number of pages..... 68 pages

Applicant's name.....: GuangZhou STS Lighting Equipment Co., Ltd.

Address.....: No.251 Tingshi North Road Chaoyang Shijing Town Baiyun District
Guangzhou China

Test specification:

Standard..... : EN IEC 60598-2-17:2018 used in conjunction with
EN IEC 60598-1:2021 + A11:2022
EN 61347-2-13:2014+A1:2017 used in conjunction with
EN 61347-1:2015+A1:2021
EN IEC 62031:2020+A11:2021
EN 62471:2008
EN 62493:2015+A1:2022
IEC TR 62778:2014

Test procedure.....: CE-LVD

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

Test Report Form No.....: IEC60598_2_17G

Test Report Form(s) Originator.....: Intertek Semko AB




Master TRF.....: Dated 2022-06-10

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General disclaimer:

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

Test item description :	Lighting Equipment	
Trade Mark(s) :	N/A	
Manufacturer :	Same as applicant	
Model/Type reference :	MSPOT300BSW, MSPOT500BSW, MSPOT400BSW, MSPOT200, M SPOT200II, MSPOT200III/HYBRID, MSPOT120, MSPOT90/II, MSPOT75, MSPOT60, MWASH1920Z, MWASH1960Z, MWASH400, MWASH500	
Ratings :	100-240V~, 50/60Hz, 500W	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
<input checked="" type="checkbox"/> Testing Laboratory:	Shenzhen Clab Testing Co., Ltd.	
Testing location/ address :	1st Floor, No.85 Guangshen Rd, Xin'an St 11 District, Bao'an District, Shenzhen	
Tested by (name, function, signature) :	Jeson Fu	
Approved by (name, function, signature) ... :	Michael Ling	
		
<input type="checkbox"/> Testing procedure: CTF Stage 1:		
Testing location/ address :		
Tested by (name, function, signature) :		
Approved by (name, function, signature) ... :		
<input type="checkbox"/> Testing procedure: CTF Stage 2:		
Testing location/ address :		
Tested by (name + signature) :		
Witnessed by (name, function, signature) .. :		
Approved by (name, function, signature) ... :		
<input type="checkbox"/> Testing procedure: CTF Stage 3:		
<input type="checkbox"/> Testing procedure: CTF Stage 4:		
Testing location/ address :		
Tested by (name, function, signature) :		
Witnessed by (name, function, signature) .. :		
Approved by (name, function, signature) ... :		
Supervised by (name, function, signature) :		

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

- Appendix 1: National differences.(2 pages)
- Appendix 2: For requirement of EN 61347-1:2015+A1:2021. (6 pages)
- Appendix 3: For requirement of EN IEC 62031:2020/A11:2021. (6 pages)
- Appendix 4: For requirement of EN 62471:2008. (6 pages)
- Appendix 5: For requirement of EN 62493:2015+A1:2022. (2 pages)
- Appendix 6: For requirement of EN 62778:2014. (1 pages)
- Appendix 7: Photo document of product. (10 pages)

Summary of testing:

The products covered by this report have been tested and complies with the applicable requirements of this standard.

Determination of the test result includes consideration of measurement uncertainty from the test equipment and the test methods.

Tests performed (name of test and test clause):

- EN IEC 60598-2-17:2018
 - EN IEC 60598-1:2021/A11:2022
 - EN 62493:2015/A1:2022
 - EN IEC 62031:2020/A11:2021
- The LED module complies with the requirements of IEC 62031:2020/A11:2021.
- According to EN 62471:2008 the sample was classified as Group 0; According to IEC/TR 62778:2014 the sample was classified as Group 0

Testing location:

Shenzhen Clab Testing Co., Ltd.
1st Floor, No.85 Guangshen Rd, Xin'an St 11 District, Bao'an District, Shenzhen

Summary of compliance with National Differences (List of countries addressed):

EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES

The product fulfils the requirements of EN IEC 60598-2-17:2018 used in conjunction with EN IEC 60598-1:2021 + A11:2022

Use of uncertainty of measurement for decisions on conformity (decision rule):

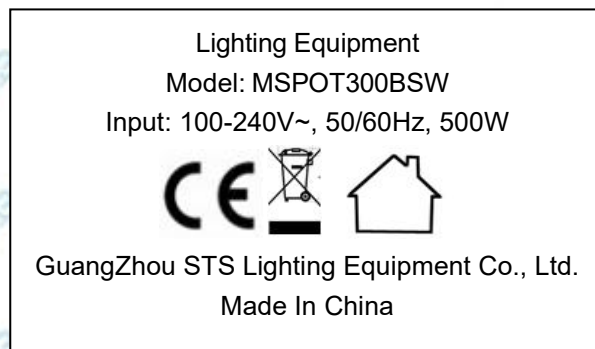
- No decision rule is specified by the IEC standard, when comparing the measurement result with the applicable limit according to the specification in that standard. The decisions on conformity are made without applying the measurement uncertainty ("simple acceptance" decision rule, previously known as "accuracy method").
- Other:... (to be specified, for example when required by the standard or client, or if national accreditation requirements apply)

Information on uncertainty of measurement:

The uncertainties of measurement are calculated by the laboratory based on application of criteria given by OD-5014 for test equipment and application of test methods, decision sheets and operational procedures of IECEE.

IEC Guide 115 provides guidance on the application of measurement uncertainty principles and applying the decision rule when reporting test results within IECEE scheme, noting that the reporting of the measurement uncertainty for measurements is not necessary unless required by the test standard or customer.

Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

Copy of marking plate

1. The height of graphical symbols is more than 5mm.
2. The height of letters and numerals are more than 2mm.
3. The height of WEEE marking shall be at least 7 mm.

Test item particulars:	
Classification of installation and use.....:	Portable luminaires and normal use
Supply Connection.....:	Appliance connection
.....:	
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.....:	2024-10-28
Date (s) of performance of tests.....:	2024-10-28 to 2024-11-08
General remarks:	
<p>The test results presented in this report relate only to the object tested.</p> <p>This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.</p> <p>"(See Enclosure #)" refers to additional information appended to the report.</p> <p>"(See appended table)" refers to a table appended to the report.</p> <p>Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.</p> <p>Clause numbers between brackets refer to clauses in IEC 60598-1</p> <p>The related applicable OSM decisions have been considered and the requirements found fulfilled.</p>	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC 60598-1:	
<p>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.....:</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable
<p>When differences exist; they shall be identified in the General product information section.</p>	
Name and address of factory (ies) :	
<p>GuangZhou STS Lighting Equipment Co., Ltd. No.251 Tingshi North Road Chaoyang Shijing Town Baiyun District Guangzhou China</p>	
General product information:	
<p>These products are portable luminaires, input 100-240V~, 50/60Hz, class I, for indoor use only.</p> <p>1, All tests are performed on the representative model MSPOT300BSW</p> <p>2, All models of PCB layout and key components are the same.</p>	

IEC 60598-2-17			
Clause	Requirement + Test	Result - Remark	Verdict
17.2 (0)	GENERAL TEST REQUIREMENTS		P
17.2 (0.1)	Information for luminaire design considered	Standard Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
17.2 (0.3)	More sections applicable.....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
17.4 (0.7.2)	Light source safety standard	IEC 62031	—
	Luminaire design in the light source safety standard	IEC 62778	P

17.4 (2)	CLASSIFICATION		P
17.4 (2.2)	Type of protection.....	Class I	—
17.4(2.3)	Degree of protection.....	IP20	—
17.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces.....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
17.4 (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"/>	—

17.5 (3)	MARKING		P
17.5 (3.2)	Mandatory markings		P
	Position of the marking	On the enclosure surface	P
	Format of symbols/text	See attached rating label	P
17.5 (3.3)	Additional information		P
	Language of instructions	English	P
17.5 (3.3.1)	Combination luminaires		N/A
17.5 (3.3.2)	Nominal frequency in Hz	50/60Hz	P
17.5 (3.3.3)	Operating temperature		N/A
17.5 (3.3.4)	Symbol or warning notice		N/A
17.5 (3.3.5)	Wiring diagram		N/A
17.5 (3.3.6)	Special conditions		N/A
17.5 (3.3.7)	Metal halide lamp luminaire – warning		N/A
17.5 (3.3.8)	Limitation for semi-luminaires		N/A
17.5 (3.3.9)	Power factor and supply current		N/A
17.5 (3.3.10)	Suitability for use indoors		P
17.5 (3.3.11)	Luminaires with remote control		N/A
17.5 (3.3.12)	Clip-mounted luminaire – warning		N/A
17.5 (3.3.13)	Specifications of protective shields		N/A
17.5 (3.3.14)	Symbol for nature of supply	~	P

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Clause	Requirement + Test	Result - Remark	Verdict
17.5 (3.3.15)	Rated current of socket outlet		N/A
17.5 (3.3.16)	Rough service luminaire		N/A
17.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments	Appliance inlet	N/A
17.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A
17.5 (3.3.19)	Protective conductor current in instruction if applicable		N/A
17.5 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
17.5 (3.3.21)	Non replaceable and non-user replaceable light sources information provided	Non-user replaceable light sources	P
	Cautionary symbol		N/A
17.5 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
17.5 (3.4)	Test with water	15s	P
	Test with hexane	15s	P
	Legible after test		P
	Label attached		P
17.5.1 (-)	If luminaire design imposes restriction of use the luminaire is marked with		N/A
	Indication of the "top"		N/A
	Designed position or range of angle		N/A
	Mounting arrangements		N/A
17.5.2 (-)	Warning if lamp $\leq 250W$		N/A
17.5.3 (-)	Maximum ambient temperature t_a		N/A
17.5.4 (-)	Minimum distances from flammable materials		N/A
17.5.5 (-)	Warning if applicable		N/A
17.5.6 (-)	Value of exterior surface temperature		P
	a) after 5 min	32.5°C	P
	b) when steady state	50.3°C	P
17.5.7 (-)	Instruction leaflet contain warnings		P
	Visibly damaged shields shall be changed		P
	Damaged or thermally deformed lamp shall be changed		P
17.6 (4)	CONSTRUCTION		P
17.6 (4.2)	Components replaceable without difficulty		P
17.6 (4.3)	Wireways smooth and free from sharp edges		P

IEC 60598-2-17			
Clause	Requirement + Test	Result - Remark	Verdict
17.6 (4.4)	Lampholders		N/A
17.6 (4.4.1)	Integral lampholder		N/A
17.6 (4.4.2)	Wiring connection		N/A
17.6 (4.4.3)	Lampholder for end- to-end mounting		N/A
17.6 (4.4.4)	Positioning		N/A
	- pressure test (N)		N/A
	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)		N/A
	After test the lampholder have not moved from its position and show no permanent deformation		N/A
17.6 (4.4.5)	Peak pulse voltage		N/A
17.6 (4.4.6)	Centre contact		N/A
17.6 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A
17.6 (4.4.8)	Lamp connectors		N/A
17.6 (4.4.9)	Caps and bases correctly used		N/A
17.6 (4.5)	Starter holders		N/A
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
17.6 (4.6)	Terminal blocks		N/A
	Tails		N/A
	Unsecured blocks		N/A
17.6 (4.7)	Terminals and supply connections		P
17.6 (4.7.1)	Contact to metal parts		P
17.6 (4.7.2)	Test 8 mm live conductor		P
	Test 8 mm earth conductor		P
17.6 (4.7.3)	Terminals for supply conductors		P
17.6 (4.7.3.1)	Welded connections:		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

IEC 60598-2-17			
Clause	Requirement + Test	Result - Remark	Verdict
	- electrical test according to 15.9		N/A
	- heat test according to 15.9.2.3 and 15.9.2.4		N/A
17.6 (4.7.4)	Terminals other than supply connection		N/A
17.6 (4.7.5)	Heat-resistant wiring/sleeves		N/A
17.6 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A
17.6 (4.8)	Switches:		P
	- adequate rating		P
	- adequate fixing		P
	- polarized supply		P
	- compliance with 61058-1 for electronic switches		N/A
17.6 (4.9)	Insulating lining and sleeves		P
17.6 (4.9.1)	Retainment		N/A
	Method of fixing.....:		N/A
17.6 (4.9.2)	Insulated linings and sleeves		N/A
	Resistant to a temperature > 20 °C to the wire temperature or		N/A
	a) & c) Insulation resistance and electric strength		N/A
	b) Ageing test. Temperature (°C).....:		N/A
17.6 (4.10)	Insulation of Class II luminaires		N/A
17.6 (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
17.6 (4.10.2)	Assembly gaps:		P
	- not coincidental		P
	- no straight access with test probe		P
17.6 (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
17.6 (4.11)	Electrical connections		P
17.6 (4.11.1)	Contact pressure		P

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Clause	Requirement + Test	Result - Remark	Verdict
17.6 (4.11.2)	Screws:		P
	- self-tapping screws		P
	- thread-cutting screws		N/A
17.6 (4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
17.6 (4.11.4)	Material of current-carrying parts		P
17.6 (4.11.5)	No contact to wood or mounting surface		P
17.6 (4.11.6)	Electro-mechanical contact systems		N/A
17.6 (4.12)	Mechanical connections and glands		P
17.6 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N/A
	Torque test: torque (Nm); part.....	Screw of enclosure: 1.2 Nm	P
	Torque test: torque (Nm); part.....	Screw of PCB: 0.5Nm	P
	Torque test: torque (Nm); part.....	Screw of earthing: 0.8 Nm	P
17.6 (4.12.2)	Screws with diameter <3 mm screwed into metal		P
17.6 (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
17.6 (4.12.5)	Screwed glands; force (Nm).....		N/A
17.6 (4.13)	Mechanical strength		P
17.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm).....	0.35Nm for lens	N/A
	- other parts; energy (Nm).....	Enclosure, Lamphshade: 0.5Nm	P
	1) live parts		P
	2) linings		N/A
	3) protection		P
	4) covers		P
17.6 (4.13.3)	Straight test finger		P
17.6 (4.13.4)	Rough service luminaires		N/A
	- IP54 or higher		N/A
	a) fixed		N/A
	b) hand-held		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	c) delivered with a stand		N/A
	d) for temporary installations and suitable for mounting on a stand		N/A
17.6 (4.13.6)	Tumbling barrel		N/A
17.6 (4.14)	Suspensions and adjusting devices		N/A
17.6 (4.14.1)	Mechanical load:		N/A
	A) four times the weight		N/A
	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
17.6 (4.14.2)	Load to flexible cables		N/A
	Mass (kg)		N/A
	Stress in conductors (N/mm ²)		N/A
	Mass (kg) of semi-luminaire		N/A
	Bending moment (Nm) of semi-luminaire		N/A
17.6 (4.14.3)	Adjusting devices:		N/A
	- flexing test; number of cycles..... :		N/A
	- strands broken		N/A
	- electric strength test afterwards		N/A
17.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
17.6 (4.14.5)	Guide pulleys		N/A
17.6 (4.14.6)	Strain on socket-outlets		N/A
17.6 (4.15)	Flammable materials:		P
	- glow- wire test 650 °C	Enclosure	P
	- spacing ≥ 30 mm		N/A
	- screen withstanding test of 13.3.1		N/A
	- screen dimensions		N/A
	- no fiercely burning material		P
	- thermal protection		N/A
	- electronic circuits exempted		N/A

IEC 60598-2-17			
Clause	Requirement + Test	Result - Remark	Verdict
17.6 (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
17.6 (4.16)	Luminaires for mounting on normally flammable surfaces		N/A
	No lamp control gear		N/A
17.6 (4.16.1)	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
17.6 (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
17.6 (4.16.3)	Design to satisfy the test of 12.6	(see 12.6)	N/A
17.6 (4.17)	Drain holes		N/A
	Clearance at least 5 mm		N/A
17.6 (4.18)	Resistance to corrosion:		P
17.6 (4.18.1)	- rust-resistance		P
17.6 (4.18.2)	- season cracking in copper		N/A
17.6 (4.18.3)	- corrosion of aluminium		N/A
17.6 (4.19)	Ignitors compatible with ballast		N/A
17.6 (4.20)	Rough service vibration		N/A
17.6 (4.21)	Protective shield:		N/A
17.6 (4.21.1)	Shield fitted		N/A
	Shield of glass if tungsten halogen lamps		N/A
17.6 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
17.6 (4.21.3)	No direct path		N/A
17.6 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment		N/A
17.6 (4.22)	Attachments to lamps		N/A
17.6 (4.23)	Semi-luminaires comply Class II		N/A
17.6 (4.24)	UV radiation for tungsten halogen lamps and metal halide lamps (Annex P)		N/A
17.6 (4.25)	No sharp point or edges		P

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Clause	Requirement + Test	Result - Remark	Verdict
17.6 (4.26)	Short-circuit protection:		N/A
17.6 (4.26.1)	Uninsulated accessible SELV parts		N/A
17.6 (4.26.2)	Short-circuit test		N/A
17.6 (4.26.3)	Test chain according to Figure 29		N/A
17.6 (4.27)	Terminal blocks with integrated screwless earthing contacts tested 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
17.6 (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 (°C).....		—
	100 cycles between t min and t max		N/A
	Temperature sensing control still in position		N/A
17.6 (4.29)	Luminaires with non-replaceable light source		P
	Not possible to replace light source		P
	Live part not accessible after parts have been opened by hand or tools		P
17.6 (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
17.6 (4.31)	Insulation between circuits		P
	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
17.6 (4.31.1)	SELV circuits		P

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Clause	Requirement + Test	Result - Remark	Verdict
	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		P
	Insulating of SELV circuits from FELV		N/A
	Insulating of SELV circuits from other SELV circuits		P
	SELV circuits insulated from accessible parts according Table X.1		P
	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
17.6 (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
17.6 (4.31.3)	Other circuits		P
	Other circuits insulated from accessible parts according Table X.1		P
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		N/A
	- conductive parts are connected together		N/A
	- test according 7.2.3		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

IEC 60598-2-17			
Clause	Requirement + Test	Result - Remark	Verdict
	- master luminaire provided with terminal for accessible conductive parts of slave luminaires		N/A
	- slave luminaire constructed as class I		N/A
17.6 (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
17.6.1 (-)	Not possible to insert a lamp into a "live" lampholder (for some luminaires)		N/A
17.6.2 (-)	Prevent immediate access to the lamp or marked according 17.5.5 if applicable		N/A
17.6.3 (-)	Fitted with a protective shield or marked only for lamps comply with Sheet 357-IEC-3155		N/A
17.6.4 (-)	Bearing parts of hanger are capable to support ten time the weight of the luminaire		N/A
	Non-combustible materials		N/A
	Parts of hanger carrying a proportion of the weight of the luminaire are capable to support ten time the proportion of weight		N/A
	Connection between hanger and luminaire locked		N/A
17.6.5 (-)	Removable accessories cannot fall out of the luminaire from any position		P
17.6.6 (-)	If applicable a secondary suspension provided and passed the test		N/A

IEC 60598-2-17			
Clause	Requirement + Test	Result - Remark	Verdict
17.7 (11)	CREEPAGE DISTANCES AND CLEARANCES		P
	Working voltage (V).....:	100-240VAC	—
	Voltage form	Sinusoidal <input checked="" type="checkbox"/> Non-sinusoidal <input type="checkbox"/>	—
	PTI	< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>	—
	Impulse withstand category (Normal category II) (Category III Annex U)	Category II <input checked="" type="checkbox"/> Category III <input type="checkbox"/>	—
	Rated pulse voltage (kV).....:	--	—
	(1) Current-carrying parts of different polarity: cr (mm); cl (mm).....:	Cr.>3.2mm, Cl.>3.2mm	P
	(2) Current-carrying parts and accessible parts: cr (mm); cl (mm).....:	Cr.>6.5mm, Cl.>6.5mm	P
	(3) Parts becoming live due to breakdown of basic insulation and metal parts: cr (mm); cl (mm).....:	Cr.>6.5mm, Cl.>6.5mm	P
	(4) Outer surface of cable where it is clamped and metal parts: cr (mm); cl (mm).....:		N/A
	(6) Current-carrying parts and supporting surface: cr (mm); cl (mm).....:	Cr.>6.5mm, Cl.>6.5mm	P

17.8 (7)	PROVISION FOR EARTHING		P
17.8 (7.2.1 + 7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		P
	Resistance < 0,5 Ω.....:	0.04Ω	P
	Self-tapping screws used		P
	Thread-forming screws		N/A
	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
17.8 (7.2.2 + 7.2.3)	Earth continuity in joints etc.		P
17.8 (7.2.4)	Locking of clamping means		P
	Compliance with 4.7.3		N/A
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
17.8 (7.2.5)	Earth terminal integral part of connector socket		N/A
17.8 (7.2.6)	Earth terminal adjacent to mains terminals		P

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Clause	Requirement + Test	Result - Remark	Verdict
17.8 (7.2.7)	Electrolytic corrosion of the earth terminal		N/A
17.8 (7.2.8)	Material of earth terminal		P
	Contact surface bare metal		P
17.8 (7.2.10)	Class II luminaire for looping-in		N/A
	Double or reinforced insulation to functional earth		N/A
17.8 (7.2.11)	Earthing core coloured green-yellow		P
	Length of earth conductor		P

17.9 (14)	SCREW TERMINALS		N/A
	Separately approved; component list	(see Annex 1)	N/A
	Part of the luminaire	(see Annex 3)	N/A

17.9 (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

17.10 (5)	EXTERNAL AND INTERNAL WIRING		P
17.10 (5.2)	Supply connection and external wiring		P
17.10 (5.2.1)	Means of connection.....	Appliance inlet	P
17.10 (5.2.2)	Type of cable.....		P
	Nominal cross-sectional area (mm ²).....		P
	Cables equal to IEC 60227 or IEC 60245		P
17.10 (5.2.3)	Type of attachment, X, Y or Z		N/A
17.10(5.2.5)	Type Z not connected to screws		N/A
17.10 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
17.10 (5.2.7)	Cable entries through rigid material have rounded edges		P
17.10 (5.2.8)	Insulating bushings:		N/A
	- suitably fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- tubes or guards made of insulating material		N/A
17.10 (5.2.9)	Locking of screwed bushings		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
17.10 (5.2.10)	Cord anchorage:		P
	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		P
	- no tying of cables into knots etc.		P
	- insulating material or lining		P
17.10 (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
17.10(5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		N/A
17.10 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N)..... : 30		P
	- torque test: torque (Nm)..... : 0.08		P
	- displacement ≤ 2 mm	0.02mm	P
	- no movement of conductors		P
	- no damage of cable or cord		P
17.10 (5.2.11)	External wiring passing into luminaire		N/A
17.10(5.2.12)	Looping- in terminals		N/A
17.10 (5.2.13)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N/A
17.10 (5.2.14)	Mains plug same protection		P
	Class III luminaire plug		N/A
17.10 (5.2.16)	Appliance inlets (IEC 60320)		N/A
	Appliance couplers of class II type		N/A

IEC 60598-2-17			
Clause	Requirement + Test	Result - Remark	Verdict
17.10 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
17.10 (5.2.18)	Used plug in accordance with		N/A
	- IEC 60083		N/A
	- other standard		N/A
17.10 (5.3)	Internal wiring		P
17.10 (5.3.1)	Internal wiring of suitable size and type	1672 18AWG	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
17.10 (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
17.10 (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
17.10 (5.3.1.3)	Double or reinforced insulation for class II		N/A
17.10 (5.3.1.4)	Conductors without insulation		N/A
17.10 (5.3.1.5)	SELV current-carrying parts		P
17.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
17.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		P
	Joints, raising/lowering devices		N/A
	Telescopic tubes etc.		N/A
	No twisting over 360°		P
17.10 (5.3.3)	Insulating bushings:		N/A
	- suitable fixed		N/A
	- material in bushings		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- material not likely to deteriorate		N/A
	- cables with protective sheath		N/A
17.10 (5.3.4)	Joints and junctions effectively insulated		P
17.10 (5.3.5)	Strain on internal wiring		N/A
17.10 (5.3.6)	Wire carriers		N/A
17.10 (5.3.7)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		P
17.10.1 (-)	Cross-sectional area (mm ²) ≥ 0,75 for current ≤ 3A and ≥ 1,5 for current > 3A	for current ≤ 3A	P
17.10.2 (-)	Plugs and sockets not interchangeable		N/A

17.11(8)	PROTECTION AGAINST ELECTRIC SHOCK		P
17.11(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 and adjustable luminaires		N/A
	Basic insulated parts not accessible with Ø 50 mm probe from outside, within arm's reach, on wall-mounted 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		P
	Double-ended high pressure discharge lamp		N/A
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
17.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
17.11 (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
17.11 (8.2.3.b)	- glass protective shields not used as supplementary insulation		N/A
	BC lampholder of metal in class I luminaires shall be earthed		N/A
17.11 (8.2.3.c)	Class III luminaires with exposed SELV 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
17.11 (8.2.4)	Portable luminaire have protection independent of supporting surface		N/A
17.11 (8.2.5)	Compliance with the standard test finger or relevant probe		P
17.11 (8.2.6)	Covers reliably secured		P
17.11 (8.2.7)	Discharging of capacitors $\geq 0,5 \mu\text{F}$		P
	Portable plug connected luminaire with capacitor		N/A
	Other plug connected luminaire with capacitor		N/A
	Discharge device on or within capacitor		N/A
	Discharge device mounted separately		N/A

17.12(12)	ENDURANCE TEST AND THERMAL TEST		P
17.12 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 17.13		—
17.12 (12.3)	Endurance test:		P
	- mounting- position.....	Mounted at the test corner as normal used	—
	- test temperature (°C).....	35	—
	- total duration (h).....	240	—
	- supply voltage: Un factor; calculated voltage (V)	264V	—
	- lamp used.....	LED lamp	—

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Clause	Requirement + Test	Result - Remark	Verdict
17.12 (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
17.12 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
17.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	P
17.12 (12.6)	Thermal test (failed lamp control gear condition):		N/A
17.12 (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
17.12 (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
17.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N/A
17.12 (12.7.1)	Luminaire without temperature sensing control		N/A
17.12 (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

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Clause	Requirement + Test	Result - Remark	Verdict
	- case of abnormal conditions		—
	- measured winding temperature (°C): at 1,1 Un...:		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un.....:		—
	- calculated temperature of fixing point/exposed part (°C).....:		—
	Ball-pressure test:		N/A
	- part tested; temperature (°C).....:		N/A
	- part tested; temperature (°C).....:		N/A
17.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N/A
	- case of abnormal conditions		—
	- measured winding temperature (°C): at 1,1 Un...:		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un.....:		—
	- calculated temperature of fixing point/exposed part (°C).....:		—
	Ball-pressure test:		N/A
	- part tested; temperature (°C).....:		N/A
	- part tested; temperature (°C).....:		N/A
17.12 (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
17.12 (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:		N/A
	- part tested; temperature (°C).....:		N/A
	- part tested; temperature (°C).....:		N/A
17.12.1 (-)	Exterior surface temperature	(see Annex 2)	P

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Clause	Requirement + Test	Result - Remark	Verdict
17.13(9)	RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE		P
17.13 (-)	If IP > IP 20 the order of the test specified in clause 17.12		—
17.13(9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP..... : IP 20		—
	- mounting position during test..... : As in normal use		—
	- fixing screws tightened; torque (Nm)..... : --		—
	- tests according to clauses..... : Clause 9.2.0		—
	- electric strength test afterwards		N/A
	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 SELV parts or 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
	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
17.13 (9.3)	Humidity test 48 h		P

17.14 (10)	INSULATION RESISTANCE AND ELECTRIC STRENGTH		P
17.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø :		—
	Insulation resistance (MΩ)		—
	SELV:		N/A
	- 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

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Clause	Requirement + Test	Result - Remark	Verdict
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :		N/A
	- Insulation bushings as described in Section 5 ... :		N/A
	Other than SELV:		P
	- between live parts of different polarity..... :	>100MΩ	P
	- between live parts and mounting surface..... :	>100MΩ	P
	- between live parts and metal parts..... :	>100MΩ	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
17.14 (10.2.2)	Electric strength test		P
	Dummy lamp		N/A
	Luminaires with ignitors after 24 h test		N/A
	Luminaires with manual ignitors		N/A
	Test voltage (V):		N/A
	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..... :	1480V	P
	- between live parts and mounting surface..... :	1480V	P
	- between live parts and metal parts..... :	1480V	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

IEC 60598-2-17			
Clause	Requirement + Test	Result - Remark	Verdict
17.14 (10.3)	Touch current or protective conductor current (mA)..... :	0.04	P

17.15(13)	RESISTANCE TO HEAT, FIRE AND TRACKING		P
17.15(13.2.1)	Ball-pressure test:		P
	- part tested; temperature (°C)..... :	Bobbin of transformer: 125°C 0.7mm	P
	- part tested; temperature (°C)..... :	PCB: 125°C 0.9mm	P
	- part tested; temperature (°C)..... :	Lampshade: 75°C 0.8mm	P
	- part tested; temperature (°C)..... :		N/A
	- part tested; temperature (°C)..... :		N/A
	- part tested; temperature (°C)..... :		N/A
17.15 (13.3.1)	Needle flame test (10 s):		P
	- part tested..... :	Bobbin of transformer	P
	- part tested..... :	PCB of controlgear	P
	- part tested..... :		P
	- part tested..... :		P
	- part tested..... :		P
17.15 (13.3.2)	Glow-wire test (650°C):		P
	- part tested..... :	Lampshade	P
	- part tested..... :		N/A
17.15 (13.4.1)	Tracking test:		N/A
	- part tested..... :		N/A
	- part tested..... :		N/A

IEC 60598-2-17			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 1: components							P
object/part No.	code	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity	
Plug	B	Ningbo Qiaopu Electric Co., Ltd.	D03	250VAC, 10/16A	VDE 0620-1	VDE mark	
Supply cord	B	Ningbo Qiaopu Electric Co., Ltd	H05VV-F	3G0.75mm ²	IEC 60227	VDE mark	
Connector	B	GuangZhou STS Lighting Equipment Co.,Ltd.	--	250V~, 20A	EN 60598-1 EN 60598-2-17	CE mark	
Internal wire	C	DONGGUAN WENCHANG ELECTRONIC CO LTD	VW-1	300VAC, 18AWG,105 °C	UL 1015	UL	
_Alt	C	Various	VW-1	300VAC, 18AWG,105 °C	UL 1569	UL E325715	
PCB	C	Various	Various	130°C,V-0	UL 94	Tested with appliance	
LED	C	GUANGHAO ELECTRONICS	--	60W	EN 60598-1 EN 60598-2-17	tested with appliance	
Drive power supply	C	Various	Various	Input: 100-240V, 50/60Hz, 300W Output: V1 28V V2 12V	EN 60598-1 EN 60598-2-17	CE mark	
Heat shrinkable tube	C	DONGGUAN SALIPT CO LTD	SALIPT S-901-600	600 V, 125°C	IEC 60968	UL E209436 and tested with appliance	
Appliance connector	B	GuangZhou STS Lighting Equipment Co.,Ltd.	Various	AC 250V 10A	EN 60598-1 EN 60598-2-17	Tested with appliance	
Switch	C	GuangZhou STS Lighting Equipment Co., Ltd.	--	250V, T125/55	EN 60598-1 EN 60598-2-17	ENEC mark	
Motor	D	Various	42-3458-25B	28Ω	EN 60598-1 EN 60598-2-17	Tested with appliance	
DC fan	B	Sunon	92252V3-100C-A99	DC 24V, 1.08W	EN 60598-1 EN 60598-2-17	Tested with appliance	

IEC 60598-2-17						
Clause	Requirement + Test			Result - Remark		Verdict
-Alt	B	SANONDA	JF0612HS-D10	DC 12V, 0.2A	EN 60598-1 EN 60598-2-17	CE mark

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

IEC 60598-2-17			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2: temperature measurements, thermal tests of Section 12	P
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	Type reference.....	MSPOT300BSW	—			
	Lamp used.....	Lighting Equipment	—			
	Lamp control gear used.....	Integral LED controlgear	—			
	Mounting position of luminaire.....	As in normal use	—			
	Supply wattage (W).....	532.4	—			
	Supply current (A).....	2.29	—			
	Calculated power factor.....	--	—			
	Table: measured temperatures corrected for ta = 25 °C:		P			
	- abnormal operating mode.....	Short-circuit output of LED control gear	—			
	- test 1: rated voltage.....		—			
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage.....	1.06x240=254.4V	—			
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage.....	-	—			
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage.....	-	—			
	Through wiring or looping-in wiring loaded by a current of A during the test	-	—			
temperature (°C) of part	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1	test 2	test 3	limit	test 4	limit
Internal wire	--	47.4	--	80	--	--
Motor 1	--	62.4	--	120	--	--
Motor 2	--	70.6	--	120	--	--
Fan	--	57.8	--	120	--	--
LED	--	64.5	--	Ref.	--	--
Switch	--	48.2	--	75	--	--
CX1 body	--	56.8	--	125	--	--
CY1 body	--	54.6	--	125	--	--
LF1		56.3		120	--	--
L3 winding	--	59.9	--	110	--	--
T1 bobbin	--	59.0	--	110	--	--
T1 winding	--	63.5	--	110	--	--

IEC 60598-2-17						
Clause	Requirement + Test				Result - Remark	Verdict
PCB near U1	--	55.3	--	130	--	--
PCB near CE1	--	54.7	--	105	--	--
PCB near F1	--	54.2	--	120	--	--
PCB near rectifier bridge	--	56.3	--	Ref.	--	--
Button	--	37.6	--	Ref.	--	--
Lampshade	--	39.4	--	Ref.	--	--
Plastic enclosure outside	--	50.2	--	75	--	--
0.1m light point	--	42.8	--	90	--	--

IEC 60598-2-17			
Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 3: screw terminals (part of the luminaire)		N/A
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(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)..... :		N/A
(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

IEC 60598-2-17			
Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 4: screwless terminals (part of the luminaire)		N/A
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(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
(15.6)	Electrical tests		N/A
	Voltage drop (mV) after 1 h (4 samples)..... :		N/A
	Voltage drop of two inseparable joints		N/A
	Number of cycles..... :		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples)..... :		N/A
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples)..... :		N/A
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples)..... :		N/A
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples)..... :		N/A

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Clause	Requirement + Test									Result - Remark	Verdict
(15.7)	Terminals external wiring										N/A
	Terminal size and rating										N/A
(15.8.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N)										N/A
	Pull test pin or tab terminals (4 samples); pull (N)										N/A
(15.9)	Contact resistance test										N/A
	Voltage drop (mV) after 1 h										N/A
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)											

IEC 60598-2-17			
Clause	Requirement + Test	Result - Remark	Verdict

Appendix 1: European Group National Differences			P
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ATTACHMENT TO TEST REPORT IEC 60598-2-17 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES Luminaires Part 2: Particular requirements: Section Seventeen - Luminaires for stage lighting, television and film studios (outdoor and indoor)			
Differences according: EN IEC 60598-2-17:2018 used in conjunction with EN IEC 60598-1:2021 + A11:2022			
TRF template used: IEC EE OD-2020-F2:2022, Ed. 1.2			
Annex Form No: EU_GD_IEC60598_2_17G Annex Form Originator.....: TÜV Rheinland LGA Products GmbH Master Annex Form.....: Dated 2023-06-09			
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CENELEC COMMON MODIFICATIONS (EN)			P
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17.6 (3)	MARKING		P
17.6 (3.3.12)	Delete NOTE 4		N/A

17.7 (4)	CONSTRUCTION		P
17.7 (4.11.6)	Electro-mechanical contact systems "the test voltage however being reduced to 1 500 V"		N/A

17.11 (5)	EXTERNAL AND INTERNAL WIRING		P
17.11 (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
17.11 (5.2.2)	Cables equal to EN 50525		N/A
	Replace table 5.1 – Supply cord		P

IEC 60598-2-17			
Clause	Requirement + Test	Result - Remark	Verdict

17.13 (12)	ENDURANCE TESTS AND THERMAL TESTS		P
17.13 (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
(5.2.18)	DK: socket-outlets		N/A
(5.2.1)	CY, DK, FI, GB: type of plug		N/A
			N/A

ZC	ANNEX ZC, NATIONAL DEVIATIONS (EN)		P
(4 & 5)	FR: Shuttered socket-outlets 10/16A		P
	GB: Requirements according to United Kingdom Building Regulation		N/A

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

-Appendix 2: The Integrated LED driver tested with EN 61347-2-13:2014+A1:2017 and EN 61347-1:2015+A1:2021

8 (10)	PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS		P
- (10.1)	Controlgear protected against accidental contact with live parts		P
- (A2)	Voltage measured with 50 kΩ		P
- (A3)	Voltage > 35 V peak or > 60 V d.c. or protective impedance device		P
- (10.1)	Lacquer or enamel not used for protection or insulation		N/A
	Adequate mechanical strength on parts providing protection		P
- (10.2)	Capacitors > 0,5 μF: voltage after 1 min (V): < 50 V :	1V	P
- (10.3)	Controlgear providing SELV		P
	Accessible conductive parts are insulated from live parts by double or reinforced insulation in SELV controlgear		P
	No connection between output circuit and the body or protective earthing circuit		P
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		P
	SELV outputs separated by at least basic insulation		P
	ELV conductive parts insulated as live parts		N/A
	Tests according Annex L of IEC 61347-1		P
- (10.4)	Accessible conductive parts in SELV circuits		P
	Output voltage under load ≤ 25 V r.m.s. or ≤ 60 V d.c.	5Vdc	P
	If output voltage > 25 V r.m.s. or > 60 V d.c.; No load output ≤ 35 V peak or ≤ 60 V d.c and touch current does not exceed 0,7 mA (peak) or 2 mA d.c. :		N/A
	One conductive part is insulated if output voltage or current exceeding the values above and withstand test voltage 500 V		N/A
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor		P
	Y1 or Y2 capacitors comply with IEC 60384-14		P

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A
8.1	SELV-equivalent controlgear accessible parts are insulated from live parts by double or reinforced insulation according 8.6 and 13.1 in IEC 60065		N/A
8.2	Exposed terminals of SELV or SELV-equivalent controlgear if: - the rated or maximum rated output voltages ≤ 25 V r.m.s. - the no-load output voltage ≤ 30 V r.m.s. or $33 \sqrt{2}$ V peak	No such terminal used	N/A
	Insulated terminals if convertor with rated output voltage > 25 V		N/A
	One capacitor Y1 or two capacitors Y2 complying with IEC 60384-14 of the same values used in series between SELV or SELV-equivalent output and primary circuits		N/A
	Other components bridging the separating transformer complying with IEC 60065, clause 14		N/A

11 (11)	MOISTURE RESISTANCE AND INSULATION		P
	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance with d.c. 500 V (M Ω):		P
	For basic insulation ≥ 2 M Ω :	>100 M Ω	P
	For double or reinforced insulation ≥ 4 M Ω :	>100 M Ω	P
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		N/A
11 (-)	Adequate insulation between input and output terminals not bounded together in SELV-equivalent controlgear		N/A

12 (12)	ELECTRIC STRENGTH		P
	Immediately after clause 11 electric strength test for 1 min		P
	Basic insulation for SELV, test voltage 500 V		P
	Working voltage ≤ 50 V, test voltage 500 V		P
	Working voltage > 50 V ≤ 1000 V, test voltage (V):		P
	Basic insulation, 2U + 1000 V	1480	P
	Supplementary insulation, 2U + 1000 V	1480	P
	Double or reinforced insulation, 4U + 2000 V	2960	P

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	No flashover or breakdown		P
	Solid or thin sheet insulation for double or reinforced insulation fulfil the requirements in Annex N in IEC 61347-1		N/A
12 (-)	Windings in separating transformers in SELV-equivalent convertors according to 14.3.2 of IEC 60065		N/A

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

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

16 (-)	ABNORMAL CONDITIONS		P
16.1 (-)	Control gear which are of the constant voltage output type:		N/A
	a) No LED module inserted		N/A
	b) Double LED modules or equivalent load connected to the output terminals		N/A
	c) Output terminal short-circuited (20 cm and 200 cm or declared length)		N/A
	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		N/A
16.2 (-)	Control gear which are of the constant current output type		P
	a) No LED module connected	Low output	P
	b) Double the LED modules or equivalent load connected in series to the output terminals		P
	c) Output terminal short-circuited (20 cm and 200 cm or declared length)	Low output	P
	Maximum output voltage not exceeded		P
	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		P

17 (15)	CONSTRUCTION		P
- (15.1)	Wood, cotton, silk, paper and similar fibrous material		P
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
- (15.2)	Printed circuits		P
	Printed circuits used as internal connections complies with clause 14		P
- (15.3)	Plugs and socket-outlets used in SELV or ELV circuits		N/A
	No dangerous compatibility between output socket-outlet and a plug for socket-outlets for input circuit in relation to installation rules, voltages and frequencies		N/A
	Plugs and socket-outlets for SELV comply with IEC 60906-3 and IEC 60884-2-4		N/A
	Plugs and socket-outlets for SELV ≤ 3 A, ≤ 25 V r.m.s. or ≤ 60 V d.c. and ≤ 72 W comply with IEC 60906-3 and IEC 60884-2-4 or:		N/A
	- plugs not able to enter socket-outlets of other standardised system		N/A

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	- socket-outlets not admit plugs of other standardised system		N/A
	- socket-outlets without protective earth		N/A
17 (-)	Socket-outlet in the output circuit does not accept plugs complying with IEC 60083 and IEC 60906		N/A
	Not possible to engage plugs accepted by socket-outlet in the output circuit with socket-outlets complying with IEC 60083 and IEC 60906		N/A

18 (16)	CREEPAGE DISTANCES AND CLEARANCES		P
- (16)	Creepage distances and clearances according to Table 3 and 4, as appropriate	(see appended table)	P
	Controlgears providing SELV comply with L.1 in Annex L		N/A
	Insulating lining of metallic enclosures		N/A
	Basic insulation on printed boards tested according to clause 14		P
	Distances subjected to both sinusoidal voltage as non-sinusoidal pulses not less than value in either Table 3 or 4		P
	Creepage distances not less than minimum clearance		P

14	TABLE: tests of fault conditions		P
Part	Simulated fault		Hazard
C3	Short-circuit, Fuse opened instantly, the appliance not working		NO
D2	Short-circuit, Fuse opened instantly, the appliance not working		NO
Q1(c-e)	Short-circuit, Fuse opened instantly, the appliance not working		NO
C7	Short-circuit, Output shut down, no hazard		NO
C6	Short-circuit, Output shut down, no hazard		NO
Output	Short-circuit, Output shut down, no hazard		NO

EN 61347-2-13							
Clause	Requirement + Test					Result - Remark	Verdict
18 (16)	TABLES: Creepage distances and clearances (All LED controlgear are encapsulated by epoxy resin)						P
Table 3	Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages						N/A
RMS working voltage (V) not exceeding	50	150	250	500	750	1000	
Creepage distances							
Required basic insulation, PTI \geq 600	0,6	0,8	1,5	3	4	5,5	
Measured			--				
Required basic insulation, PTI < 600	1,2	1,6	2,5	5	8	10	
Measured			>3,2				
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			>3,2				
Required reinforced insulation	-	3,2	5	6	8	11	
Measured			>6.5				
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			>3,9				
Table 4	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							

	Appendix 3: LED modules tested with EN 62031:2020+A11:2021	P
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4	GENERAL REQUIREMENTS		P
4.2	Classification		—
	Built-in module	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Independent module.....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Integral module	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
4.6	Independent modules comply with requirements in IEC 60598-1:2014/AMD1:2017		N/A
4.8	Modules with integrated controlgear providing SELV comply with requirements according to IEC 61347-1:2015/AMD1:2017 clause L.5 to L.11.		N/A
	(see Annex 1)		

6	MARKING		—
6.2	Contents of marking for built-in and for independent LED modules		N/A
	a) mark of origin	Integral type	N/A
	b) model number, type reference		N/A
	c1) constant voltage module; rated supply voltage and supply frequency		N/A
	c2) constant current module; rated supply current and supply frequency		N/A
	d) rated power		N/A
	e) indication of connections, wiring diagram		N/A
	f) value of t_c and place on the module		N/A
	g) E_{thr} if required		N/A
	h) symbol for built-in modules		N/A
	i) heat transfer temperature t_d		N/A
	j) power for heat-conduction P_d		N/A
	k) working voltage for insulation		N/A
6.3	Location of marking for built-in LED modules		N/A
	- marking of a) and b) in 6.2 on the modules		N/A
	- marking of other applicable items in 6.2 on the modules or in data sheet, leaflet or website		N/A
6.4	Location of marking for independent LED modules		N/A
	- marking of a), b), c) and f) in 6.2 on the modules		N/A
	- marking of other applicable items in 6.2 on the modules or in data sheet, leaflet or website		N/A
6.5	Marking of integral LED modules		N/A
	- information in 6.2 a) to g) in data sheet, leaflet or website		N/A
6.6	Durable and legibility of marking		N/A

	- marking on the LED module legible after test with water		N/A
	- marking not on the LED module legible		N/A

7	TERMINALS		—
7.1	Integral terminals		N/A
	Screw terminals comply with section 14 of IEC 60598-1	(see Annex 3)	N/A
	Screwless terminals comply with section 15 of IEC 60598-1	(see Annex 4)	N/A
7.2	Terminals other than integral terminals		N/A
	Separately approved; component list	(see Annex 2)	N/A
	Ratings suit the conditions		N/A
	Satisfy additional relevant requirements of this standard		N/A

8 (9)	EARTHING		—
- (9.1)	Provisions for protective earthing		N/A
	Terminal complying with clause 8		N/A
	Locked against loosening and not possible to loosen by hand		N/A
	Not possible to loosen clamping means unintentionally on screwless terminals		N/A
	Earthing via means of fixing		N/A
	Earthing terminal only used for the earthing of the control gear		N/A
	All parts of material minimizing the danger of electrolytic corrosion		N/A
	Made of brass or equivalent material		N/A
	Contact surface bare metal		N/A
	Test according 7.2.3 of IEC 60598-1		N/A
- (9.2)	Provision for functional earthing		N/A
	Comply with clause 8 and 9.1		N/A
	Functional earth insulated from live parts by double or reinforced insulation		N/A
- (9.3)	Lamp controlgear with conductors for protective earthing by tracks on printed circuit board		N/A
	Test with a current of 25 A between earthing terminal and each of the accessible metal parts; measured resistance (Ω) at ≥ 10 A according 7.2.3 of IEC 60598-1: $< 0,5 \Omega$		N/A
- (9.4)	Earthing of built-in lamp controlgear		N/A

	Earth by means of fixing to earthed metal of luminaire in compliance of 7.2 of IEC 60598-1		N/A
	Earthing terminal only for earthing the built-in controlgear		N/A
- (9.5)	Earthing via independent controlgear		N/A
- (9.5.1)	Earth connection to other equipment		N/A
	Looping or through connection, conductor min. 1,5 mm ² and of copper or equivalent		N/A
	Protective earthing wires in line with 5.3.1.1 and clause 7		N/A
- (9.5.2)	Earthing of the lamp compartments powered via the independent lamp controlgear		N/A
	Test with a current of 25 A between input and output earth terminals; measured resistance (Ω) between earthing terminal and each of the accessible metal parts at ≥ 10 A according 7.2.3 of IEC 60598-1: < 0,5 Ω		N/A
	Output earthing terminal marked as in 7.1 t) of IEC 61347-1		N/A

9 (10)	PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS		—
- (10.1)	Controlgear protected against accidental contact with live parts		N/A
- (A2)	Voltage measured with 50 k Ω	(see Annex A)	N/A
- (A3)	Voltage > 35 V peak or > 60 V d.c. or protective impedance device	(see Annex A)	N/A
- (10.1)	Lacquer or enamel not used for protection or insulation		N/A
	Adequate mechanical strength on parts providing protection		N/A
- (10.2)	Capacitors > 0,5 μ F: voltage after 1 min (V): < 50 V		N/A
- (10.3)	Controlgear providing SELV		N/A
	Accessible conductive parts are insulated from live parts by double or reinforced insulation in SELV controlgear		N/A
	No connection between output circuit and the body or protective earthing circuit		N/A
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		N/A
	SELV outputs separated from earth by at least basic insulation		N/A
	ELV conductive parts insulated as live parts		N/A
	Tests according Annex L of IEC 61347-1		N/A
- (10.4)	Accessible conductive parts in SELV circuits		N/A

	Output voltage under load ≤ 25 V r.m.s. or ≤ 60 V d.c.		N/A
	If output voltage > 25 V r.m.s. or > 60 V d.c.; No load output ≤ 35 V peak or ≤ 60 V d.c and touch current does not exceed 0,7 mA (peak) or 2 mA d.c. :		N/A
	One conductive part is insulated if output voltage or current exceeding the values above and withstand test voltage 500 V		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

10 (11)	MOISTURE RESISTANCE AND INSULATION		—
	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance with d.c. 500 V (M Ω):		P
	For basic insulation ≥ 2 M Ω	20 M Ω	P
	For double or reinforced insulation ≥ 4 M Ω		N/A
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		N/A

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

12 (14)	FAULT CONDITIONS		—
- (14.1)	When operated under fault conditions the controlgear:		N/A
	- does not emit flames or molten material		N/A
	- does not produce flammable gases		N/A

	- protection against accidental contact not impaired		N/A
	Thermally protected controlgear does not exceed the marked temperature value		N/A
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	N/A
- (14.2)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (after any reduction in 14.2 - 14.5)	(see appended table)	N/A
- (14.3)	Short-circuit or interruption of semiconductor devices	(see appended table)	N/A
- (14.4)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	N/A
- (14.5)	Short-circuit across electrolytic capacitors	(see appended table)	N/A
	Short-circuit or interruption of SPDs	(see appended table)	N/A
- (14.6)	After the tests has been carried out on three samples:		N/A
	The insulation resistance $\geq 1 \text{ M}\Omega$		N/A
	No flammable gases		N/A
	No accessible parts have become live		N/A
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		N/A
- (14.7)	Relevant fault condition tests with high-power a.c. supply and in turn to a d.c. supply		—
12.2	Overpower condition		P
	Module withstands overpower condition >15 min.		P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		N/A
	No fire, smoke or flammable gas is produced		P
	Molten material does not ignite tissue paper, spread below the module		P

14 (15)	CONSTRUCTION		—
- (15.1)	Wood, cotton, silk, paper and similar fibrous material		P
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
- (15.2)	Printed circuits		P
	Printed circuits used as internal connections complies with clause 14		P

15 (16)	CREEPAGE DISTANCES AND CLEARANCES		—
- (16.1)	General		N/A
	Creepage distances and clearances according to 16.2 and 16.3	(see appended table)	N/A

	Controlgears providing SELV comply with additional requirements in Annex L		N/A
	Insulating lining of metallic enclosures		N/A
	Controlgear protected against pollution comply with Annex P		N/A
- (16.2)	Creepage distances		N/A
- (16.2.2)	Minimum creepage distances for working voltages		N/A
	Creepage distances according to Table 7	(see appended table)	N/A
- (16.2.3)	Creepage distances for working voltages with frequencies above 30 kHz		N/A
	Creepage distances according to Table 8	(see appended table)	N/A
- (16.3)	Clearances		N/A
- (16.3.2)	Clearances for working voltages		N/A
	Clearances distances according to Table 9	(see appended table)	N/A
- (16.3.3)	Clearances for ignition voltages and working voltages with higher frequencies		N/A
	Clearances distances for basic or supplementary insulation according to Table 10		N/A
	Clearances distances for reinforced insulation according to Table 11		N/A

16 (17)	SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS		—
	Screws, current-carrying parts and connections in compliance with IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1)		—
(4.11)	Electrical connections		P
(4.11.1)	Contact pressure		P
(4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
(4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
(4.11.4)	Material of current-carrying parts		P
(4.11.5)	No contact to wood or mounting surface		P
(4.11.6)	Electro-mechanical contact systems		N/A
(4.12)	Mechanical connections and glands		N/A
(4.12.1)	Screws not made of soft metal		N/A
	Screws of insulating material		N/A
	Torque test: torque (Nm); part.....:		N/A
	Torque test: torque (Nm); part.....:		N/A
	Torque test: torque (Nm); part.....:		N/A
(4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A

(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
(4.12.5)	Screwed glands; force (Nm)..... :		N/A

17 (18)	RESISTANCE TO HEAT, FIRE AND TRACKING		—
- (18.1)	Ball-pressure test :	See Test Table 17 (18.1)	N/A
- (18.2)	Test of printed boards :	See Test Table 17 (18.2)	N/A
- (18.3)	Glow-wire test (650°C) :	See Test Table 17 (18.3)	N/A
- (18.4)	Needle-flame test (10 s) :	See Test Table 17 (18.4)	N/A
- (18.5)	Proof tracking test :	See Test Table 17 (18.5)	N/A

18	RESISTANCE TO CORROSION		—
	Comply with requirements according 4.18 of IEC 60598-1		N/A

20	HEAT MANAGEMENT		—
20.1	General		N/A
	Fulfil clause 20 if replaceable LED module and when heat conducting thermal interface is needed.		N/A
20.2	Thermal interface material		N/A
	Thermal interface material delivered with the module if necessary		N/A
20.3	Heat protection		N/A
	Not impair safety when operated under poor heat-conduction conditions according Annex D		N/A

22	PHOTOBIOLOGICAL SAFETY		—
22.1	UV radiation		N/A
	Luminous radiation not exceed 2mW/klm		N/A
22.2	Blue light hazard		P
	Assessed according to IEC TR 62778	RG0	P
22.3	Infrared radiation		N/A
	Requirements for infrared radiation when required		N/A

A	ANNEX A - TESTS		—
	All tests performed in accordance with the advice given in Annex H of IEC 61347-1, if applicable		N/A

14	TABLE A: tests of fault conditions			P
Part	Fault condition	Test voltage (V)	Observation	Hazard
D1	S-C	5VDC	Shutdown, No Hazard.	No Hazard
C1	S-C	5VDC	Shutdown, No Hazard.	No Hazard
R3	S-C	5VDC	Shutdown, No Hazard.	No Hazard
LED (output+/-)	S-C	5VDC	Shutdown, No Hazard.	No Hazard

Appendix 4: For requirement of EN 62471:2015+A1:2022

4	Exposure Limits	P
4.1	General	P
	The exposure limits in this standard is not less than 0,01 ms and not more than any 8-hour period and should be used as guides in the control of exposure	P
	Detailed spectral data of a light source are generally required only if the luminance of the source exceeds $10^4 \text{ cd}\cdot\text{m}^{-2}$	P
4.3	Hazard exposure limits	P
4.3.1	Actinic UV hazard exposure limit for the skin and eye	P
	The exposure limit for effective radiant exposure is $30 \text{ J}\cdot\text{m}^{-2}$ within any 8-hour period	P
	To protect against injury of the eye or skin from ultraviolet radiation exposure produced by a broadband source, the effective integrated spectral irradiance , E_s , of the light source shall not exceed the levels defined by:	P
	$E_s \cdot t = \sum_{200}^{400} \sum_t E_\lambda(\lambda, t) \cdot S_{UV}(\lambda) \cdot \Delta t \cdot \Delta \lambda \leq 30 \quad \text{J}\cdot\text{m}^{-2}$	P
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye or skin shall be computed by:	P
	$t_{\max} = \frac{30}{E_s} \quad \text{s}$	P
4.3.2	Near-UV hazard exposure limit for eye	P
	For the spectral region 315 nm to 400 nm (UV-A) the total radiant exposure to the eye shall not exceed $10000 \text{ J}\cdot\text{m}^{-2}$ for exposure times less than 1000 s. For exposure times greater than 1000 s (approximately 16 minutes) the UV-A irradiance for the unprotected eye, E_{UVA} , shall not exceed $10 \text{ W}\cdot\text{m}^{-2}$.	P
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye for time less than 1000 s, shall be computed by:	P
	$t_{\max} \leq \frac{10\,000}{E_{UVA}} \quad \text{s}$	P
4.3.3	Retinal blue light hazard exposure limit	p
	To protect against retinal photochemical injury from chronic blue-light exposure, the integrated spectral radiance of the light source weighted against the blue-light hazard function, $B(\lambda)$, i.e., the blue-light weighted radiance , L_B , shall not exceed the levels defined by:	p

	$L_B \cdot t = \sum_{300}^{700} \sum_t L_\lambda(\lambda, t) \cdot B(\lambda) \cdot \Delta\lambda \cdot \Delta t \leq 10^6 \quad \text{J} \cdot \text{m}^{-2} \cdot \text{sr}$	$t_{\text{fort}} \leq 10^4 \text{ s}$	$t_{\text{max}} = \frac{10^6}{L_B}$	p
	$L_B = \sum_{300}^{700} L_\lambda \cdot B(\lambda) \cdot \Delta\lambda \leq 100 \quad \text{W} \cdot \text{m}^{-2} \cdot \text{sr}$	$t_{\text{fort}} > 10^4 \text{ s}$		p
4.3.4	Retinal blue light hazard exposure limit - small source			N/A
	Thus the spectral irradiance at the eye E_λ , weighted against the blue-light hazard function $B(\lambda)$ shall not exceed the levels defined by:			N/A
	$E_B \cdot t = \sum_{300}^{700} \sum_t E_\lambda(\lambda, t) \cdot B(\lambda) \cdot \Delta\lambda \cdot \Delta t \leq 100 \quad \text{J} \cdot \text{m}^{-2} \cdot \text{sr}$			N/A
	$E_B = \sum_{300}^{700} E_\lambda \cdot B(\lambda) \cdot \Delta\lambda \leq 1 \quad \text{W} \cdot \text{m}^{-2}$			N/A
4.3.5	Retinal thermal hazard exposure limit			P
	To protect against retinal thermal injury, the integrated spectral radiance of the light source, L_λ , weighted by the burn hazard weighting function $R(\lambda)$ (from Figure 4.2 and Table 4.2), i.e., the burn hazard weighted radiance, shall not exceed the levels defined by:			P
	$L_R = \sum_{380}^{1400} L_\lambda \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{50\,000}{\alpha \cdot t^{0,25}} \quad \text{W} \cdot \text{m}^{-2} \cdot \text{sr}$	$(10 \mu\text{s} \leq t \leq 10 \text{ s})$		P
4.3.6	Retinal thermal hazard exposure limit – weak visual stimulus			P
	For an infrared heat lamp or any near-infrared source where a weak visual stimulus is inadequate to activate the aversion response, the near infrared (780 nm to 1400 nm) radiance, L_{IR} , as viewed by the eye for exposure times greater than 10 s shall be limited to:			P
	$L_{IR} = \sum_{780}^{1400} L_\lambda \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{6\,000}{\alpha} \quad \text{W} \cdot \text{m}^{-2} \cdot \text{sr}$	$t > 10 \text{ s}$		P
4.3.7	Infrared radiation hazard exposure limits for the eye			P
	The avoid thermal injury of the cornea and possible delayed effects upon the lens of the eye (cataractogenesis), ocular exposure to infrared radiation, E_{IR} , over the wavelength range 780 nm to 3000 nm, for times less than 1000 s, shall not exceed:			P
	$E_{IR} = \sum_{780}^{3000} E_\lambda \cdot \Delta\lambda \leq 18\,000 \cdot t^{-0,75} \quad \text{W} \cdot \text{m}^{-2}$	$t \leq 1000 \text{ s}$		P
	For times greater than 1000 s the limit becomes:			P

	$E_{IR} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta\lambda \leq 100 \quad W \cdot m^{-2}$	$t > 1000 \text{ s}$	P
4.3.8	Thermal hazard exposure limit for the skin		P
	Visible and infrared radiant exposure (380 nm to 3000 nm) of the skin shall be limited to:		P
	$E_H \cdot t = \sum_{380}^{3000} \sum_t E_{\lambda}(\lambda, t) \cdot \Delta\lambda \leq 20000 \cdot t^{0.25} \quad J \cdot m^{-2}$		P
5	Measurement of lamps and lamp systems		P
5.1	Measurement conditions		P
	Measurement conditions shall be reported as part of the evaluation against the exposure limits and the assignment of risk classification.		P
5.1.1	Lamp ageing (seasoning)		N/A
	Seasoning of lamps shall be done as stated in the appropriate IEC lamp standard.		N/A
5.1.2	Test environment		P
	For specific test conditions, see the appropriate IEC lamp standard or in absence of such standards, the appropriate national standards or manufacturer's recommendations.	Temperature maintained at $25 \pm 1^{\circ}C$, Relative humidity shall be maintained to less than 65%; Airflow shall be minimized when measuring	P
5.1.3	Extraneous radiation		P
	Careful checks should be made to ensure that extraneous sources of radiation and reflections do not add significantly to the measurement results.		P
5.1.4	Lamp operation		N/A
	Operation of the test lamp shall be provided in accordance with:		N/A
	– the appropriate IEC lamp standard, or		N/A
	– the manufacturer's recommendation		N/A
5.1.5	Lamp system operation		P
	The power source for operation of the test lamp shall be provided in accordance with:		P
	– the appropriate IEC standard, or		N/A
	– the manufacturer's recommendation		P
5.2	Measurement procedure		P
5.2.1	Irradiance measurements		P
	Minimum aperture diameter 7mm.		P
	Maximum aperture diameter 50 mm.		P

	The measurement shall be made in that position of the beam giving the maximum reading.		P
	The measurement instrument is adequate calibrated.		P
5.2.2	Radiance measurements		P
5.2.2.1	Standard method		P
	The measurements made with an optical system.		P
	The instrument shall be calibrated to read in absolute radiant power per unit receiving area and per unit solid angle to acceptance averaged over the field of view of the instrument.		P
5.2.2.2	Alternative method		N/A
	Alternatively to an imaging radiance set-up, an irradiance measurement set-up with a circular field stop placed at the source can be used to perform radiance measurements.		N/A
5.2.3	Measurement of source size		P
	The determination of α , the angle subtended by a source, requires the determination of the 50% emission points of the source.		P
5.2.4	Pulse width measurement for pulsed sources	Continuous wave lamps	N/A
	The determination of Δt , the nominal pulse duration of a source, requires the determination of the time during which the emission is > 50% of its peak value.		N/A
5.3	Analysis methods		P
5.3.1	Weighting curve interpolations		P
	To standardize interpolated values, use linear interpolation on the log of given values to obtain intermediate points at the wavelength intervals desired.		P
5.3.2	Calculations		P
	The calculation of source hazard values shall be performed by weighting the spectral scan by the appropriate function and calculating the total weighted energy.		P
5.3.3	Measurement uncertainty		P
	The quality of all measurement results must be quantified by an analysis of the uncertainty.		P
6	Lamp Classification		P
	For the purposes of this standard it was decided that the values shall be reported as follows:	see table 6.1	P

	<ul style="list-style-type: none"> for lamps intended for general lighting service, the hazard values shall be reported as either irradiance or radiance values at a distance which produces an illuminance of 500 lux, but not at a distance less than 200 mm 	at a distance which produces an illuminance of 500 lux	P
	<ul style="list-style-type: none"> for all other light sources, including pulsed lamp sources, the hazard values shall be reported at a distance of 200 mm 		N/A
6.1	Continuous wave lamps		N/A
6.1.1	Exempt Group		P
	In the exempt group are lamps, which does not pose any photobiological hazard. The requirement is met by any lamp that does not pose:		P
	<ul style="list-style-type: none"> an actinic ultraviolet hazard (E_S) within 8-hours exposure (30000 s), nor 		P
	<ul style="list-style-type: none"> a near-UV hazard (E_{UVA}) within 1000 s, (about 16 min), nor 		P
	<ul style="list-style-type: none"> a retinal blue-light hazard (L_B) within 10000 s (about 2,8 h), nor 		P
	<ul style="list-style-type: none"> a retinal thermal hazard (L_R) within 10 s, nor 		P
	<ul style="list-style-type: none"> an infrared radiation hazard for the eye (E_{IR}) within 1000 s 		P
6.1.2	Risk Group 1 (Low-Risk)		N/A
	In this group are lamps, which exceeds the limits for the exempt group but that does not pose:		N/A
	<ul style="list-style-type: none"> an actinic ultraviolet hazard (E_S) within 10000 s, nor 		N/A
	<ul style="list-style-type: none"> a near ultraviolet hazard (E_{UVA}) within 300 s, nor 		N/A
	<ul style="list-style-type: none"> a retinal blue-light hazard (L_B) within 100 s, nor 		N/A
	<ul style="list-style-type: none"> a retinal thermal hazard (L_R) within 10 s, nor 		N/A
	<ul style="list-style-type: none"> an infrared radiation hazard for the eye (E_{IR}) within 100 s 		N/A
	Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard (L_{IR}), within 100 s are in Risk Group 1.		N/A

6.1.3	Risk Group 2 (Moderate-Risk)		N/A
	This requirement is met by any lamp that exceeds the limits for Risk Group 1, but that does not pose:		N/A
	– an actinic ultraviolet hazard (E_S) within 1000 s exposure, nor		N/A
	– a near ultraviolet hazard (E_{UVA}) within 100 s, nor		N/A
	– a retinal blue-light hazard (L_B) within 0,25 s (aversion response), nor		N/A
	– a retinal thermal hazard (L_R) within 0,25 s (aversion response), nor		N/A
	– an infrared radiation hazard for the eye (E_{IR}) within 10 s		N/A
	Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard (L_{IR}), within 10 s are in Risk Group 2.		N/A
6.1.4	Risk Group 3 (High-Risk)		N/A
	Lamps which exceed the limits for Risk Group 2 are in Group 3.		N/A
6.2	Pulsed lamps		N/A
	Pulse lamp criteria shall apply to a single pulse and to any group of pulses within 0,25 s.	Continuous wave lamps	N/A
	A pulsed lamp shall be evaluated at the highest nominal energy loading as specified by the manufacturer.		N/A
	The risk group determination of the lamp being tested shall be made as follows:		N/A
	– a lamp that exceeds the exposure limit shall be classified as belonging to Risk Group 3 (High-Risk)		N/A
	– for single pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance does is below the EL shall be classified as belonging to the Exempt Group		N/A
	– for repetitively pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance dose is below the EL, shall be evaluated using the continuous wave risk criteria discussed in clause 6.1, using time averaged values of the pulsed emission		N/A

-Appendix 5: For requirement of EN 62493:2008

4	LIMITS		P
4.1	General		P
	Comply with Van der Hoofden test limit in 4.2.3 or inherently compliant in 4.2.2 and pass assessment procedure for intentional radiators in 4.3		P
4.2	Unintentional radiating part of lighting equipment		P
4.2.2	Lighting equipment deemed to comply with the Van der Hoofden test without testing		P
	1) electronic controlgear	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	2) incandescent-lamp technology	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	3) LED-light-source technology	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	4) OLED-light-source technology	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	5) high-pressure discharge lamp LED-light-source technologies	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	6) low-pressure discharge lamp technologies with exposure distance ≥ 50 cm	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	7) independent auxiliary	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Not fulfil any of 1-7 above subject to 4.2.3		—
4.2.3	Applications of limits		N/A
	Not fulfil any of 1-7 in 4.2.2 but the compliance factor F is ≤ 1		N/A
4.3	Intentional radiating part of lighting equipment		P
	Comply with one of methods in Clause 7 if intentional radiator		P

5	GENERAL		P
5.1	Measurand		P
	Test head, measuring instrumentation and measuring conditions according Clause 5.1 – 5.8		P

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

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

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

-Appendix 6: For requirement of IEC TR 62778:2014

7	MEASUREMENT INFORMATION FLOW		P
7.1	Basic flow		P
	'Law of conservation of luminance' applied		P
	Use of only true luminance/radiance values		P
	In case of luminaire: The light source is operated in the luminaire under similar conditions as when tested as a component		P
	In case E_{thr} value for RG2 was established the peak value was derived from angular light distribution	RG0	N/A
7.2	Conditions for the radiance measurement		P
	Standard condition applied (200mm distance, 0,011rad field of view)		P
	Non-standard condition applied		N/A
7.3	Special cases (I): Replacement by a lamp or LED module of another type		N/A
	Light source is a white light source		N/A
	Evaluation done based on highest luminance		N/A
	Evaluation done based on CCT value		N/A
7.4	Special cases (II): Arrays and clusters of primary light sources		P
	LED package is evaluated as	<input checked="" type="checkbox"/> RG0 unlimited <input type="checkbox"/> RG1 unlimited	P
	E_{thr} of LED package applies to array		P
8	RISK GROUP CLASSIFICATION		N/A
	Risk group achieved:		N/A
	-... Risk Group 0 unlimited		N/A
	-... Risk Group 1 unlimited		N/A
	- E_{thr} (lx) : Distance to reach RG1..... (m) :		N/A

-Appendix 7: Photo document of product



Photo1: Overall view



Photo 2: Overall view



Photo3: Overall view



Photo4: Overall view



Photo5: Internal view

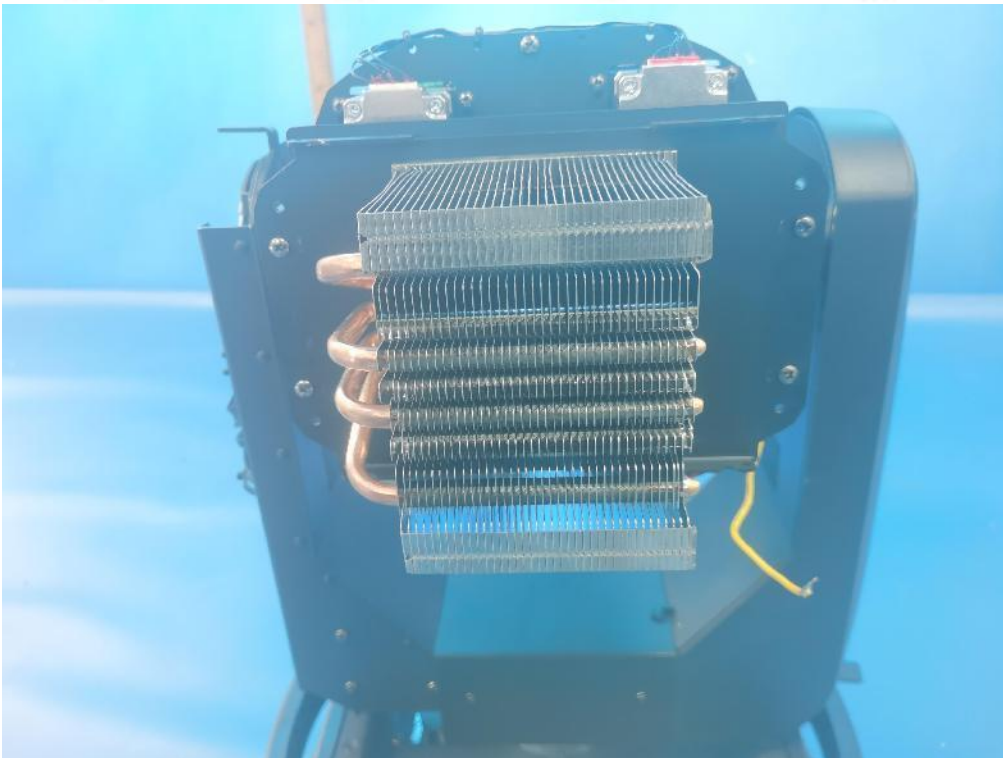


Photo 6: Air-cooling fin view

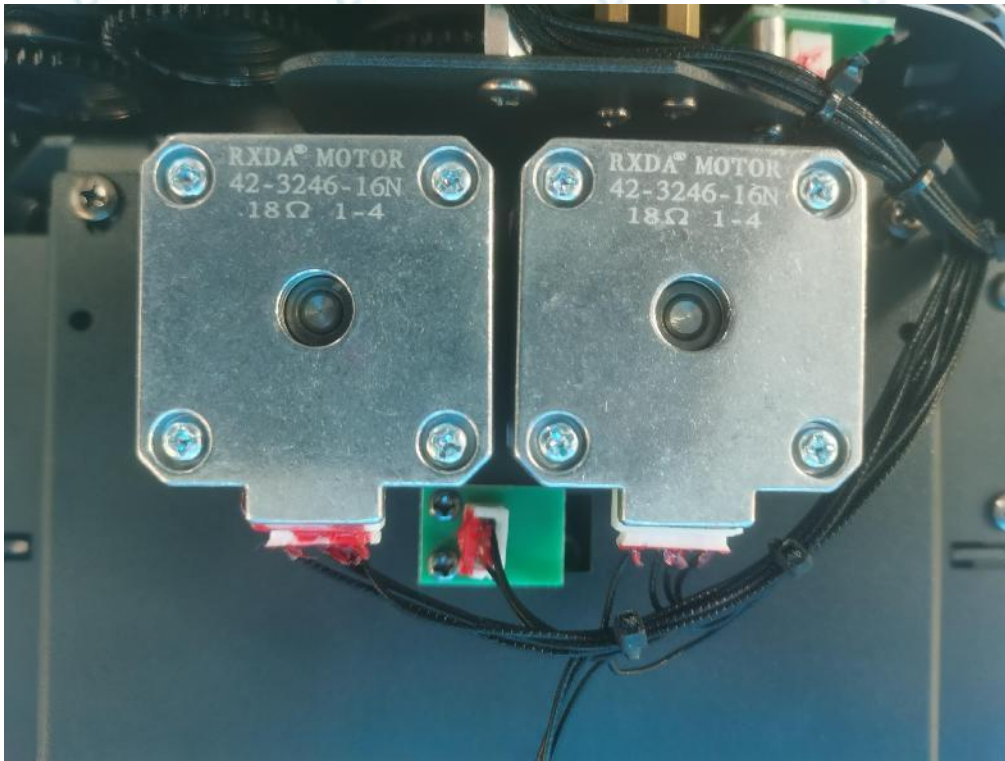


Photo 7: Motor view

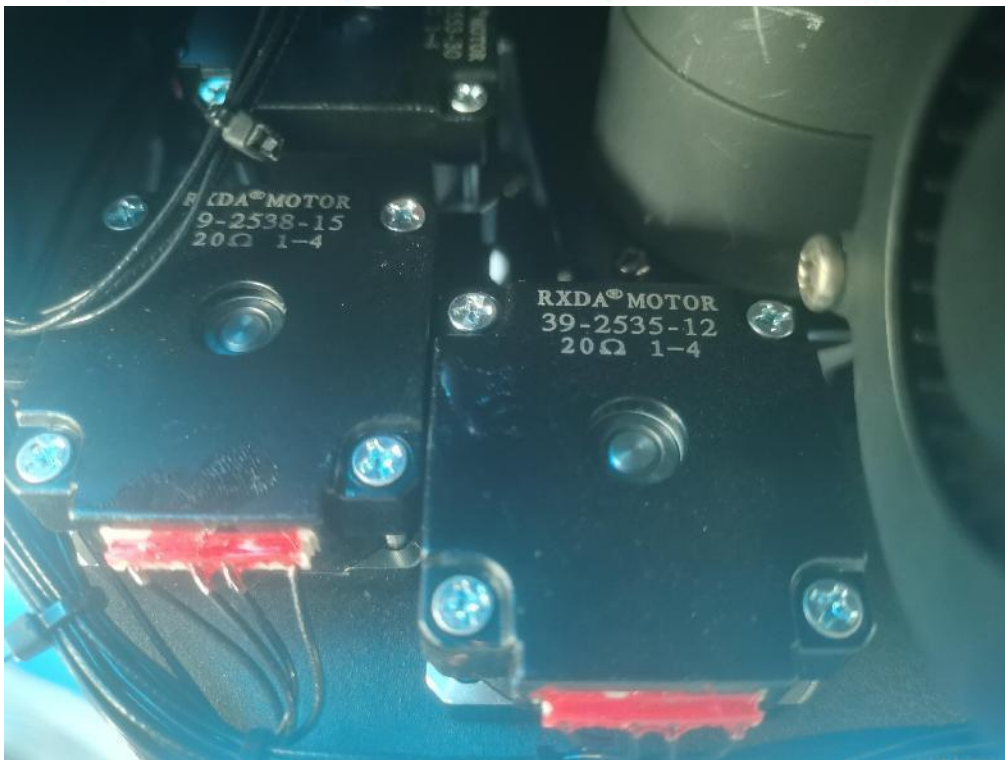


Photo 8: Motor view

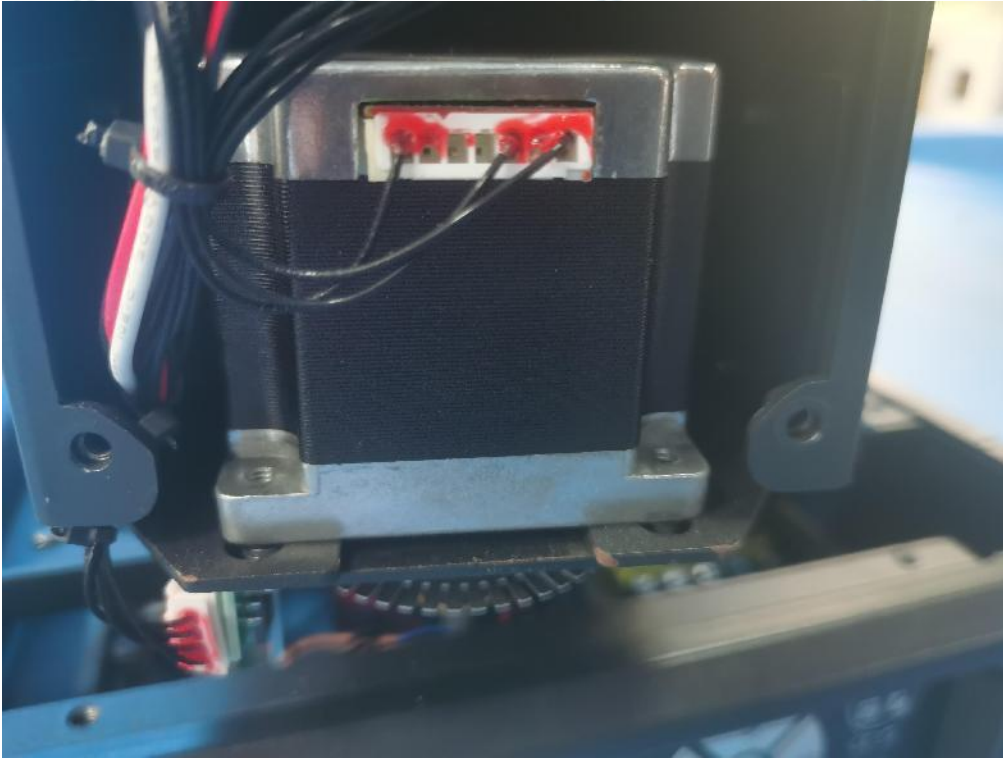


Photo 9: Motor view

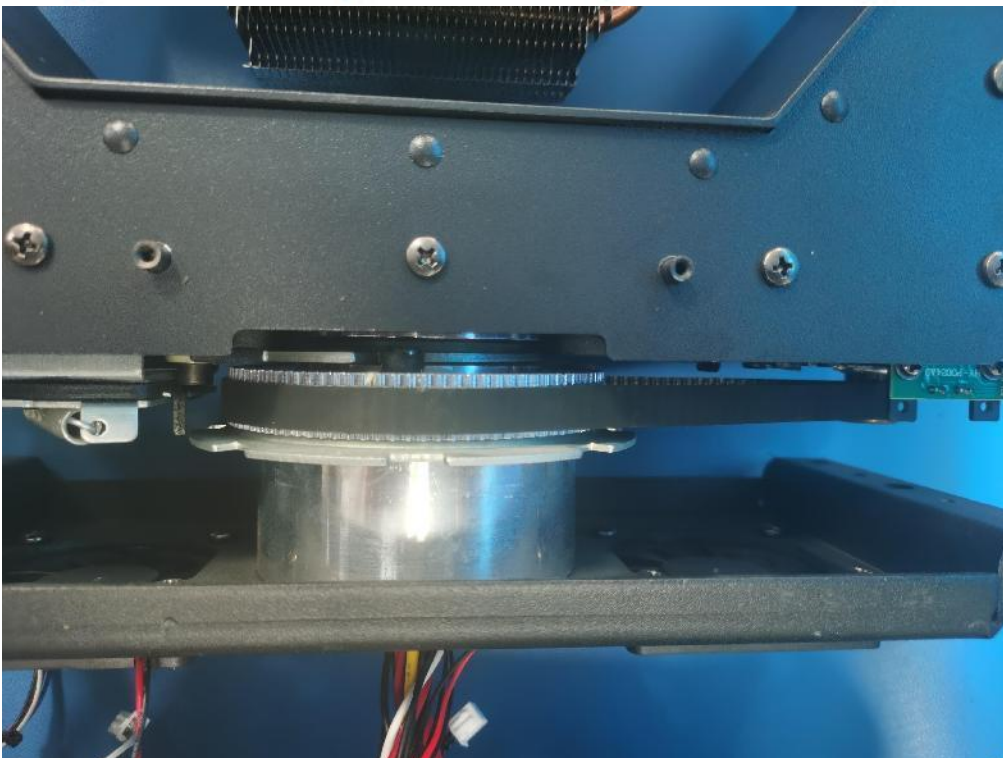


Photo 10: Motor view



Photo 11: Earth view

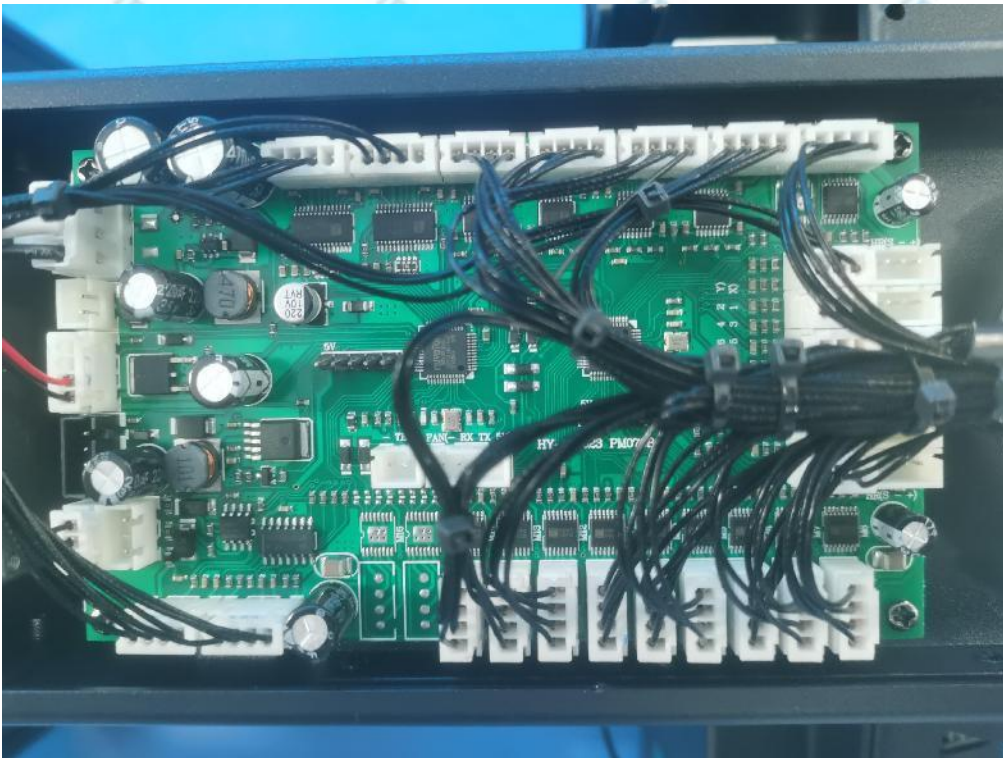


Photo 12: PCB view

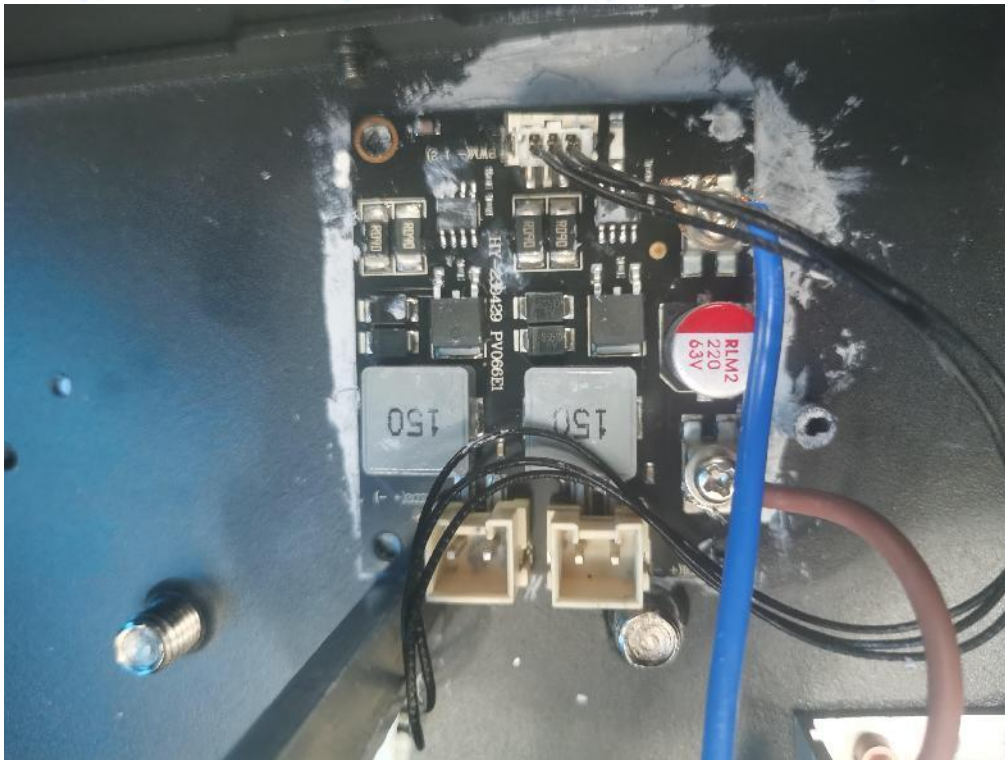


Photo 13: PCB view

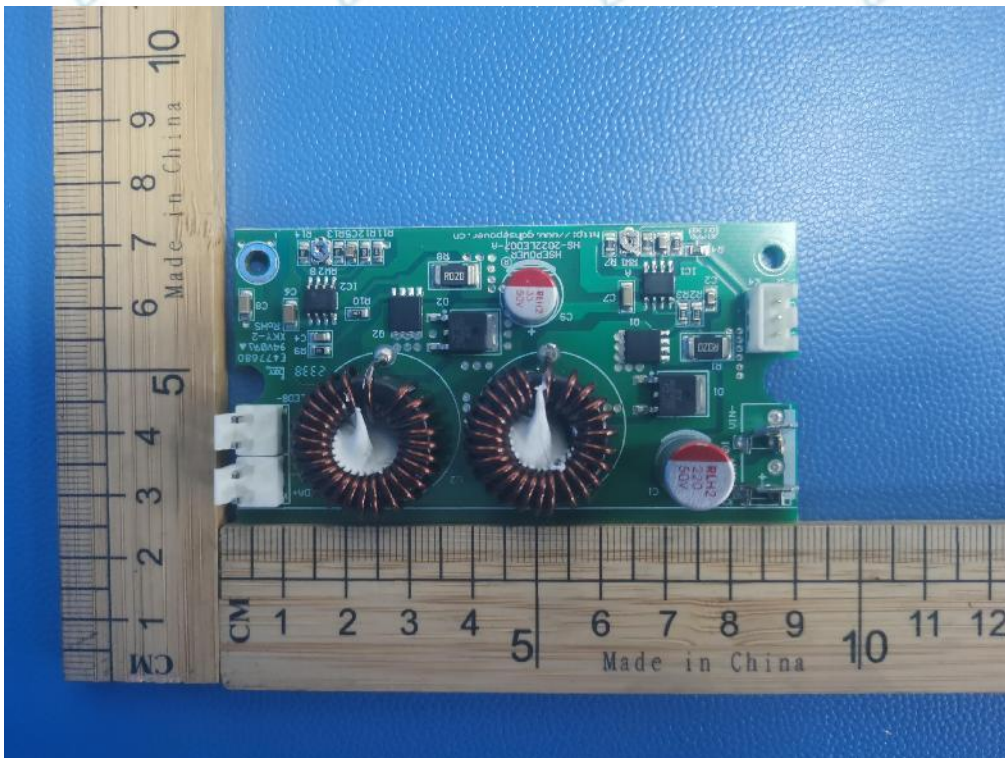


Photo 14: PCB view

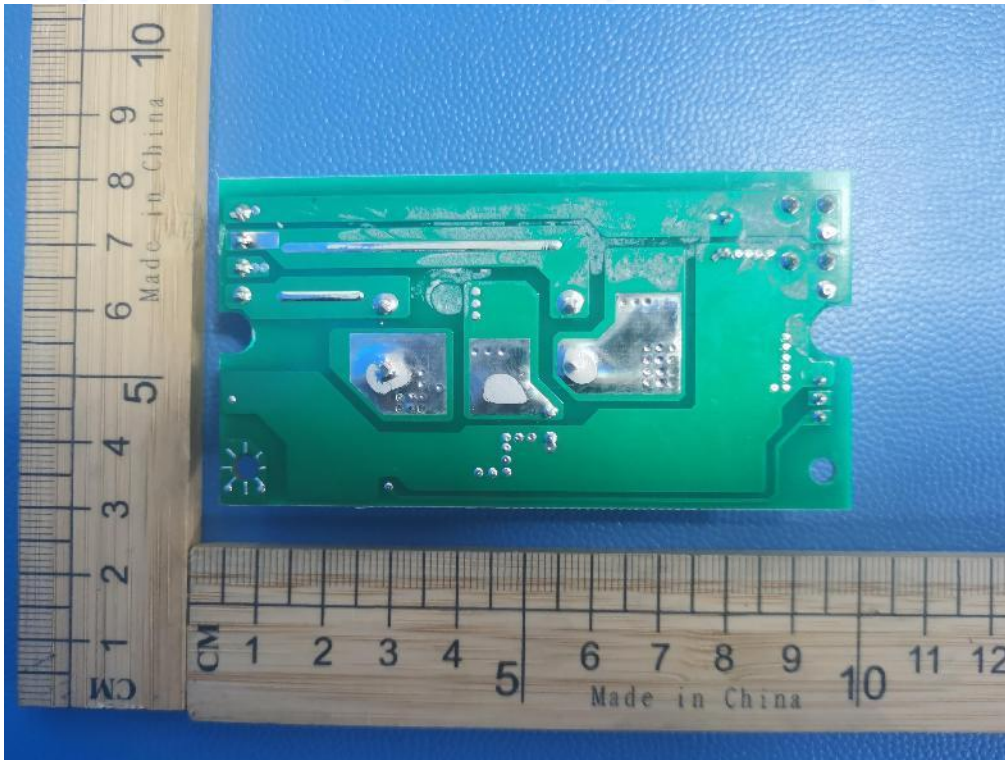


Photo 15: PCB view

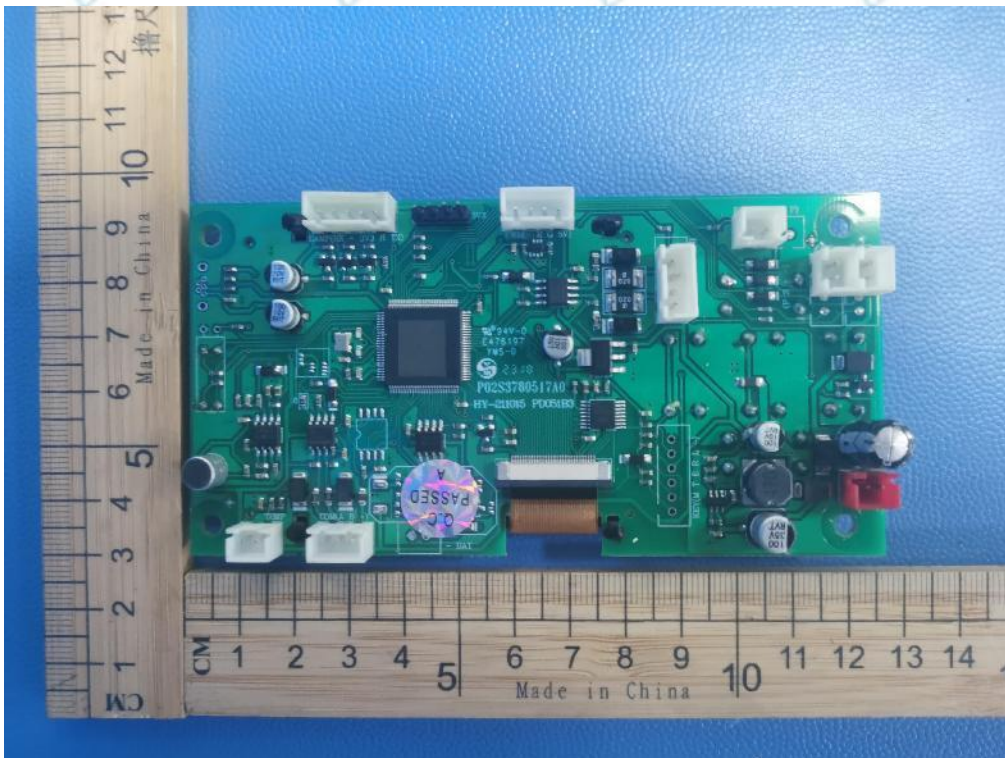


Photo 16: PCB view

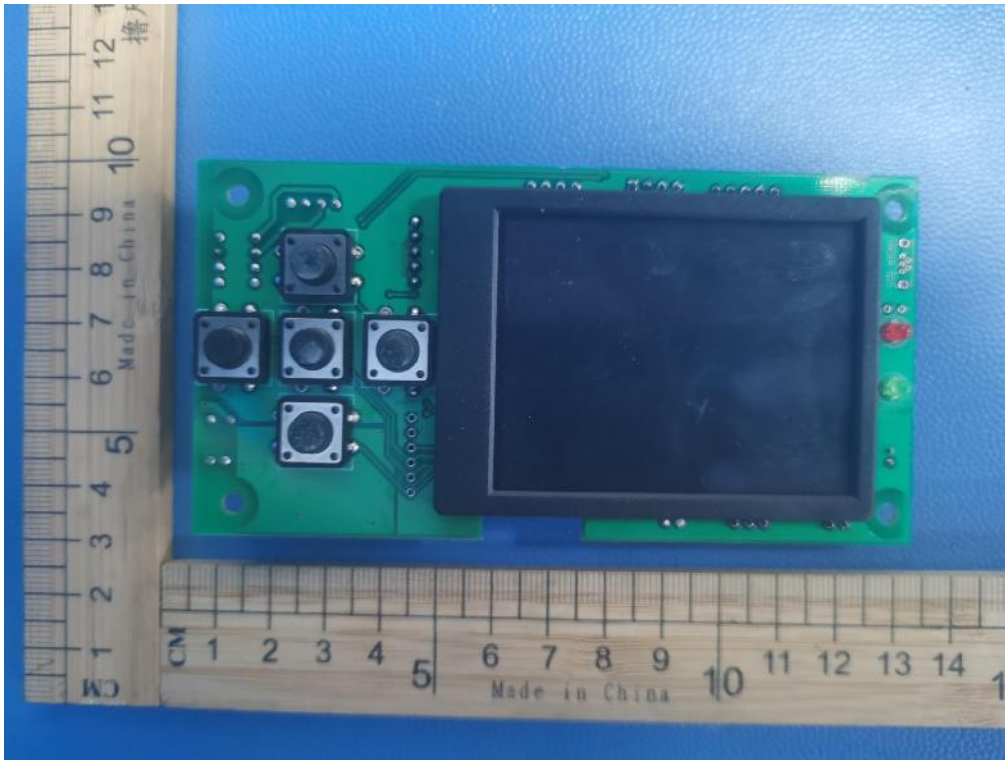


Photo 17: PCB view

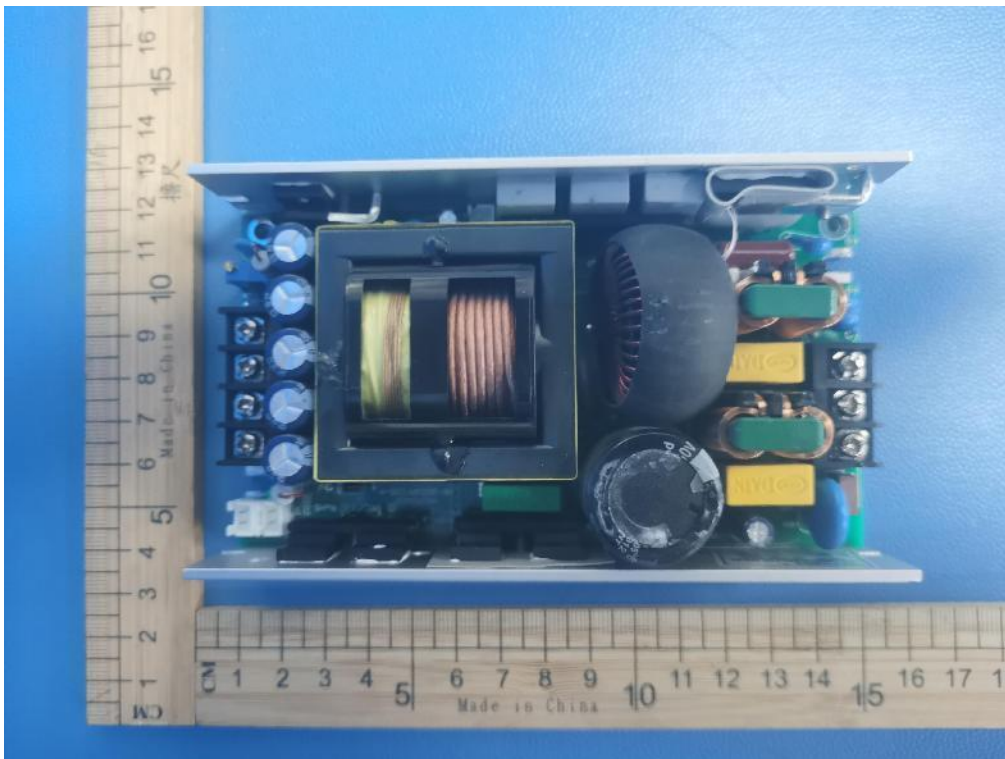


Photo 18: PCB view

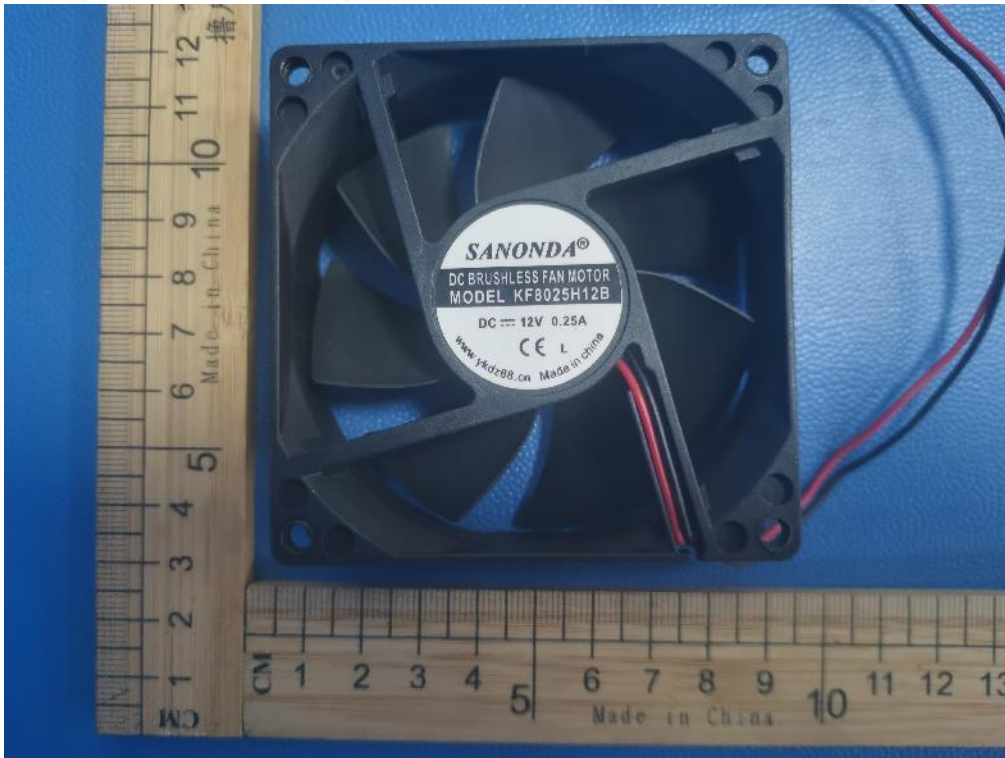


Photo 19: Fan view

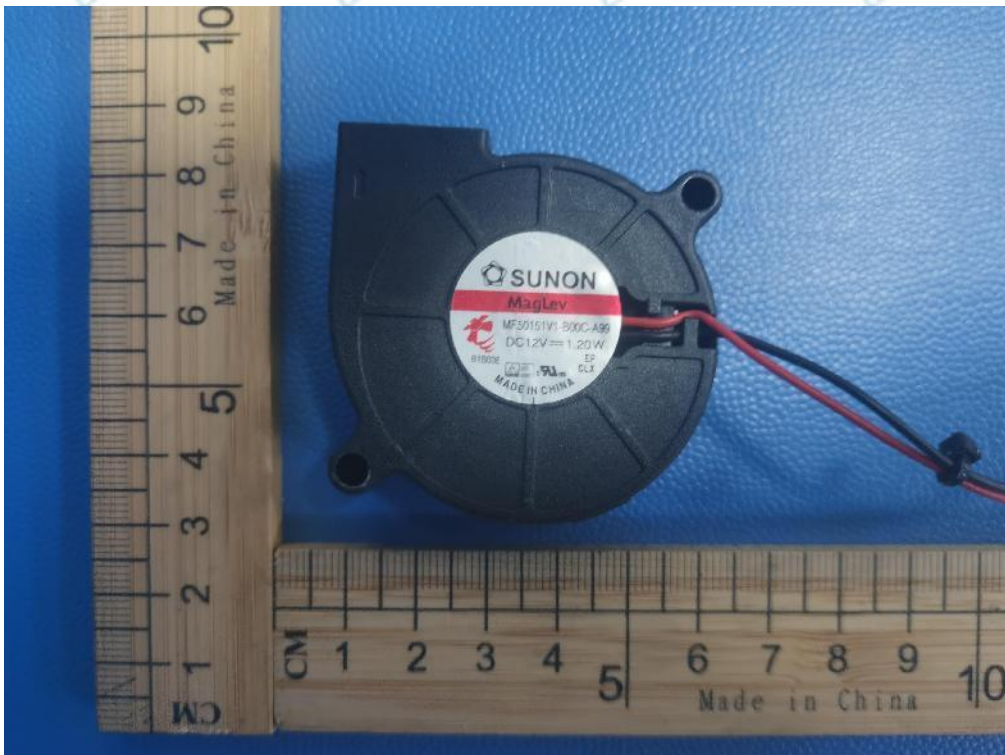


Photo 20: Fan view

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