



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

Report Number.....: LCSB10314030S

Date of issue.....: November 28, 2024

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Name of Testing Laboratory
preparing the Report.....: Shenzhen Southern LCS Compliance Testing Co., Ltd.

Applicant's name.....: RN SOLUTIONS ApS

Address.....: Hagensvej 14, 9530 Støvring, Denmark

Test specification:

Standard.....: IEC 60598-2-24:2013 used in conjunction with IEC 60598-1:2020

Test procedure.....: Type Test

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

TRF template used.....: IECEE OD-2020-F1:2021, Ed.1.4

Test Report Form No.....: IEC60598_2_24H

Test Report Form(s) Originator.....: OVE

Master TRF.....: Dated 2021-09-17

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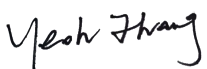
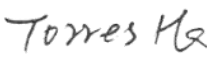
The test results presented in this report relate only to the object tested.

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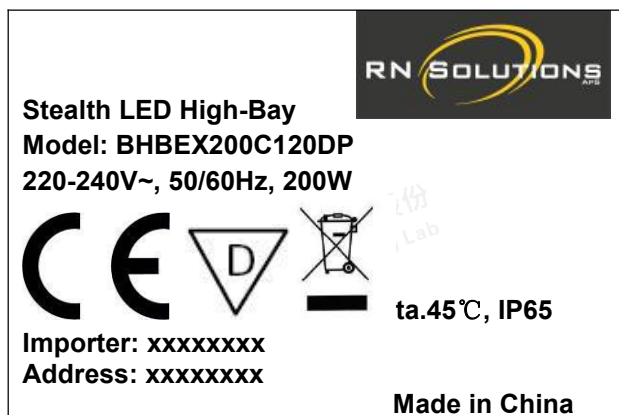


Test item description.....:	Stealth LED High-Bay	
Trade Mark.....:		
Manufacturer.....:	Same as the applicant	
Address.....:	Same as the applicant	
Model/Type reference.....:	See the model list on the page 5	
Ratings.....:	See the model list on the page 5	
☒ Testing Laboratory:		
Testing location/ address.....:	Shenzhen Southern LCS Compliance Testing Co., Ltd. Room 101-201, Building 39, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, Guangdong, China	
Tested by.....:	Yeoh Zhang (Engineer)	
Check by.....:	Torres He (Director)	
Approved by.....:	Jesse Liu (Manager)	
List of Attachments (including a total number of pages in each attachment): Attachment No. 1: European group differences and national differences according to EN 60598-2-24:2013 used in conjunction with EN IEC 60598-1:2021+A11:2022. Attachment No. 2: Report IEC/EN IEC 62031. Attachment No. 3: Report IEC TR 62778. Attachment No. 3: Photo documentation.		
Summary of testing:		
Tests performed (name of test and test clause): IEC 60598-2-24:2013 IEC 60598-1:2020 IEC TR 62778: 2014 IEC 62031:2018 IEC 62493:2015+A1:2022	Testing location: Shenzhen Southern LCS Compliance Testing Co., Ltd. Room 101-201, Building 39, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, Guangdong, China	
Summary of compliance with National Differences:		
List of countries addressed European Group differences ☒ The product fulfils the requirements of EN 60598-2-24:2013; EN IEC 60598-1:2021+A11:2022; EN 62493:2015+A1:2022; EN IEC 62031:2020+A11:2021;		



**Copy of marking plate:**

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



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

Remarks:

1. Representative markings of BHBEX200C120DP, markings of all models are identical except for the model name and rating.
2. Height of CE mark at least 5mm, height of WEEE symbol should not less than 7mm, height of other marks at least 5mm, height of letters and numerals at least 2mm.





Test item particulars..... :									
Classification of installation and use.....:	Luminaires with limited surface temperature								
Supply Connection.....:	Supply cord								
Protection Class.....:	Class I								
Degree of Protection..... :	IP65								
Possible test case verdicts:									
- test case does not apply to the test object..... : N/A									
- test object does meet the requirement..... : P (Pass)									
- test object does not meet the requirement..... : F (Fail)									
Testing..... :									
Date of receipt of test item..... :	2024-11-11								
Date (s) of performance of tests..... :	2024-11-11 ~ 2024-11-27								
General remarks:									
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. Clause numbers with "*" were not within the scope of CNAS recognition. Clause numbers between brackets refer to clauses in IEC/EN IEC 60598-1. The general information of applicant and manufacturer (such as the name and address), product name, model/type reference, trademark and other similar information contained in this report are all provided by the applicant, the laboratory is not responsible for verifying its authenticity. 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" style="width: 100%;"><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>LCSB10314030S</td><td>/</td><td>Original Version</td></tr></tbody></table>		Version	Report No.	Revision Date	Summary	V1.0	LCSB10314030S	/	Original Version
Version	Report No.	Revision Date	Summary						
V1.0	LCSB10314030S	/	Original Version						
Manufacturer's Declaration per sub-clause 4.2.5 of IEC60598-1:									
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....:	☐ 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									



**General product information:**

- All models have similar appearance except power and CCT.
- Unless otherwise specified, the model BHBEX200C120DP was chosen as representative model to perform all test. Model BHB150C120DP and BHB100C120DP were tested in thermal tests.

Model List:

Model No.	Rating	CCT	LED driver
BHB1004120DP	220-240V~, 50/60Hz, 100W, IP65, ta.45℃	4000K	Xi LP 100W 0.3-1.05A S1 WL I155
BHB1006120DP	220-240V~, 50/60Hz, 100W, IP65, ta.45℃	5700K	
BHB100C120DP	220-240V~, 50/60Hz, 100W, IP65, ta.45℃	4000K/5000K/5700K	
BHB1504120DP	220-240V~, 50/60Hz, 150W, IP65, ta.45℃	4000K	Xi LP 150W 0.3-1.05A S1 WL I175
BHB1506120DP	220-240V~, 50/60Hz, 150W, IP65, ta.45℃	5700K	
BHB150C120DP	220-240V~, 50/60Hz, 150W, IP65, ta.45℃	4000K/5000K/5700K	
BHB2004120DP	220-240V~, 50/60Hz, 200W, IP65, ta.45℃	4000K	Xi LP 200W 0.3-1.05A S1 WL I165
BHB2006120DP	220-240V~, 50/60Hz, 200W, IP65, ta.45℃	5700K	
BHB200C120DP	220-240V~, 50/60Hz, 200W, IP65, ta.45℃	4000K/5000K/5700K	
BHBEX2004120DP	220-240V~, 50/60Hz, 200W, IP65, ta.45℃	4000K	
BHBEX200C120DP	220-240V~, 50/60Hz, 200W, IP65, ta.45℃	4000K/5000K/5700K	
BHBHO2004120DP	220-240V~, 50/60Hz, 200W, IP65, ta.45℃	4000K	
BHBHO2006120DP	220-240V~, 50/60Hz, 200W, IP65, ta.45℃	5700K	





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

24.3 (0)	GENERAL TEST REQUIREMENTS		P
24.3 (0.3)	More sections applicable.....:	Yes ☐ No ☒ Section/s:	—
24.3 (0.5)	Components	(see Annex 1)	—
24.3 (0.7)	Information for luminaire design in light sources standards		—
24.3 (0.7.2)	Light source safety standard	IEC/EN IEC 62031	—
	Luminaire design in the light source safety standard		P

24.5 (2)	CLASSIFICATION OF LUMINAIRES		P
24.5 (2.2)	Type of protection	Class I	P
24.5 (2.3)	Degree of protection.....:	IP65	—
24.5 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces.....:	Yes ☒ No ☐	—
24.5 (2.5)	Luminaire for normal use	Yes ☒ No ☐	—
	Luminaire for rough service	Yes ☐ No ☐	—
24.5 (-)	a) Luminaire where no unusual accumulation of dust is expected		—
	b) Luminaire where an accumulation of non-conductive dust may be expected		—
	c) Luminaire where an accumulation of conductive dust may be expected	IP65	—

24.6 (3)	MARKING		P
24.6 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
24.6 (3.3)	Additional information		P
	Language of instructions	English	P
24.6 (3.3.1)	Combination luminaires		N/A
24.6 (3.3.2)	Nominal frequency in Hz	50/60Hz	P
24.6 (3.3.3)	Operating temperature		N/A
24.6 (3.3.5)	Wiring diagram		N/A
24.6 (3.3.6)	Special conditions		N/A
24.6 (3.3.7)	Metal halide lamp luminaire – warning		N/A



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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
24.6 (3.3.8)	Limitation for semi-luminaires		N/A
24.6 (3.3.9)	Power factor and supply current		P
24.6 (3.3.10)	Suitability for use indoors		N/A
24.6 (3.3.11)	Luminaires with remote control		N/A
24.6 (3.3.12)	Clip-mounted luminaire – warning		N/A
24.6 (3.3.13)	Specifications of protective shields		N/A
24.6 (3.3.14)	Symbol for nature of supply	~	P
24.6 (3.3.15)	Rated current of socket outlet		N/A
24.6 (3.3.16)	Rough service luminaire		N/A
24.6 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments	Type Y	P
24.6 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A
24.6 (3.3.19)	Protective conductor current in instruction if applicable		N/A
24.6 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
24.6 (3.3.21)	Non replaceable and non-user replaceable light sources information provided	Non-user replaceable	P
24.6 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
24.6 (3.3.23)	Luminaires without control gear provided with necessary information for selection of appropriate component		N/A
24.6 (3.3.24)	If not supplied with terminal block, information on the packaging		N/A
24.6 (3.3.25)	Luminaires employing light sources emitting UV on mains wiring, information provided		N/A
24.6 (3.3.26)	Wall mounted luminaire using external flexible cable or cord longer than 0.3 m, information provided		N/A
24.6 (3.4)	Test with water		P





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

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





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Clause	Requirement + Test	Result - Remark	Verdict
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
24.7 (4.6)	Terminal blocks		N/A
	Tails		N/A
	Unsecured blocks		N/A
24.7 (4.7)	Terminals and supply connections		P
24.7 (4.7.1)	Contact to metal parts		N/A
24.7 (4.7.2)	Test 8 mm live conductor		N/A
	Test 8 mm earth conductor		N/A
24.7 (4.7.3)	Terminals for supply conductors		P
24.7 (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 15.6.2		N/A
	- electrical test according to 15.6.3		N/A
	- heat test according to 15.6.3.2.3 and 15.6.3.2.4		N/A
24.7 (4.7.4)	Terminals other than supply connection		N/A
24.7 (4.7.5)	Heat-resistant wiring/sleeves		N/A
24.7 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A
24.7 (4.8)	Switches		P
	- adequate rating	Switch approved	P
	- adequate fixing		P
	- polarized supply		N/A
	- compliance with IEC 61058-1 for electronic switches		N/A
24.7 (4.9)	Insulating lining and sleeves		N/A
24.7 (4.9.1)	Retainment		N/A
	Method of fixing.....:		N/A
24.7 (4.9.2)	Insulated linings and sleeves:		N/A





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Clause	Requirement + Test	Result - Remark	Verdict
	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
24.7 (4.10)	Double or reinforced insulation		N/A
24.7 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		N/A
	Safe installation fixed luminaires		N/A
	Capacitors and switches		N/A
24.7 (4.10.2)	Assembly gaps:		N/A
	- not coincidental		N/A
	- no straight access with test probe		N/A
24.7 (4.10.3)	Retainment of insulation:		N/A
	- fixed		N/A
	- unable to be replaced; luminaire inoperative		N/A
	- sleeves retained in position		N/A
	- lining in lamp holder		N/A
24.7 (4.10.4)	Protective impedance device		N/A
	Basic and supplementary insulation bridged by resistor(s) or appropriate capacitor		N/A
	Double or reinforced insulation bridged by at least two separate resistors in series or appropriate capacitor(s)		N/A
	Capacitors comply with IEC 60384-14		N/A
	Resistors comply with test (a) in 14.2 of IEC 60065		N/A
24.7 (4.11)	Electrical connections and current-carrying parts		P
24.7 (4.11.1)	Contact pressure		P
24.7 (4.11.2)	Screws:		P
	- self-tapping screws		P
	- thread-cutting screws		N/A





IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
24.7 (4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
24.7 (4.11.4)	Material of current-carrying parts		P
24.7 (4.11.5)	No contact to wood or mounting surface		P
24.7 (4.11.6)	Electro-mechanical contact systems		N/A
24.7 (4.12)	Screws and connections (mechanical) and glands		P
24.7 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N/A
	Torque test: torque (Nm); part.....:	Screw to fix metal ring to glass: 1.20Nm. Screw to fix LED PCB: 0.5Nm. Screw to fix canopy and lamp frame: 2.5Nm. Screw on lamp frame to fix cord anchorage of LED input wire: 1.20Nm. Screw on metal sheet to fix cord anchorage of LED input wire: 0.5Nm. Screw on metal sheet to fix enclosure of LED driver: 1.2Nm. Screw to fix ground wire: 1.2Nm. Screw to fix cord anchorage of supply cord: 1.2Nm.	P
	Torque test: torque (Nm); part.....:		N/A
	Torque test: torque (Nm); part.....:		N/A
24.7 (4.12.2)	Screws with diameter < 3 mm screwed into metal		P
24.7 (4.12.4)	Locked connections:		N/A
	- fixed arms; torque (Nm).....:		N/A
	- lamp holder; torque (Nm).....:		N/A
	- push-button switches; torque 0,8 Nm.....:		N/A
24.7 (4.12.5)	Screwed glands; force (Nm).....:	Metal glands: 7.5Nm	P



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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
24.7 (4.13)	Mechanical strength		P
24.7 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm).....		N/A
	- other parts; energy (Nm).....	0,35Nm, no damage	P
	1) live parts		P
	2) linings		N/A
	3) protection		P
	4) covers		P
24.7 (4.13.2)	Metal parts have adequate mechanical strength		P
24.7 (4.13.3)	Straight test finger		P
24.7 (4.13.4)	Rough service luminaires		N/A
	- IP54 or higher		N/A
	a) fixed		N/A
	b) hand-held		N/A
	c) delivered with a stand		N/A
	d) for temporary installations and suitable for mounting on a stand		N/A
24.7 (4.13.6)	Tumbling barrel		N/A
24.7 (4.14)	Suspensions, fixings and means of adjusting		P
24.7 (4.14.1)	Mechanical load:		P
	A) four times the weight	4 x Max.6.85Kg	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





IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
24.7 (4.14.2)	Load to flexible cables		N/A
	Mass (kg)		—
	Stress in conductors (N/mm ²)		N/A
	Mass (kg) of semi-luminaire		N/A
	Bending moment (Nm) of semi-luminaire		N/A
24.7 (4.14.3)	Adjusting devices:		N/A
	- flexing test; number of cycles.....		N/A
	- strands broken.....		N/A
	- electric strength test afterwards		N/A
24.7 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
24.7 (4.14.5)	Guide pulleys		N/A
24.7 (4.14.6)	Strain on socket-outlets		N/A
24.7 (4.15)	Flammable materials		P
	- glow-wire test 650°C.....	See Test Table 24.15 (13.3.2)	P
	- spacing ≥30 mm		N/A
	- screen withstanding test of 13.3.1		N/A
	- screen dimensions		N/A
	- no fiercely burning material		P
	- thermal protection		N/A
	- electronic circuits exempted		N/A
24.7 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		N/A
	a) construction		N/A
	b) temperature sensing control		N/A
	c) surface temperature		N/A
24.7 (4.16)	Luminaires for mounting on normally flammable surfaces		P
	No lamp control gear.....	(compliance with Section 12)	N/A
	Provided with adaptor for a track meet the requirements for direct mounting on normally flammable surfaces		N/A





IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
24.7 (4.16.1)	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
24.7 (4.16.2)	Thermal protection:		N/A
	- in lamp control gear		N/A
	- external		N/A
	- fixed position		N/A
	- temperature marked lamp control gear		N/A
24.7 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N/A
24.7 (4.17)	Drain holes		N/A
	Clearance at least 5 mm		N/A
24.7 (4.18)	Resistance to corrosion		P
24.7 (4.18.1)	- rust-resistance		P
24.7 (4.18.2)	- season cracking in copper		N/A
24.7 (4.18.3)	- corrosion of aluminium		P
24.7 (4.19)	Igniters compatible with ballast		N/A
24.7 (4.20)	Rough service vibration		N/A
24.7 (4.21)	Protective shield		N/A
24.7 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A
	Shield of glass if tungsten halogen lamps		N/A
24.7 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
24.7 (4.21.3)	No direct path		N/A
24.7 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment.....	See Test Table 24.16 (13.3.2)	N/A
24.7 (4.22)	Attachments to lamps not cause overheating or damage		N/A





IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
24.7 (4.23)	Semi-luminaires comply Class II		N/A
24.7 (4.24)	Photobiological hazards		P
24.7 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N/A
24.7 (4.24.2)	Retinal blue light hazard		P
	Class of risk group assessed according to IEC/TR 62778	RG1	—
	Luminaires with E_{thr} :		N/A
	a) Fixed luminaires		N/A
	- distance x m, borderline between RG1 and RG2.:		N/A
	- marking and instruction according 3.2.23		N/A
	b) Portable and handheld luminaires		N/A
	- marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778		N/A
	Portable luminaires for children IEC 60598-2-10 and Mains socket outlet nightlights IEC 60598-2-12 not exceed RG1 at 200 mm according to IEC/62778		N/A
24.7 (4.25)	Mechanical hazard		P
	No sharp point or edges		P
24.7 (4.26)	Short-circuit protection		N/A
24.7 (4.26.1)	Adequate means of uninsulated accessible SELV / PELV parts		N/A
24.7 (4.26.2)	Short-circuit test with test chain according 4.26.3:		N/A
	Supply source ES1 PSE		N/A
	Test chain not melt through		N/A
	Test sample not exceed values of Table 12.1 and 12.2		N/A
24.7 (4.27)	Terminal blocks with integrated screwless protective earthing contacts		N/A
	Test according Annex V		N/A
	Pull test of terminal fixing (20 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Pull test of mechanical connection (50 N)		N/A
	After test, resistance < 0,05 Ω		N/A





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Clause	Requirement + Test	Result - Remark	Verdict
	Voltage drop test, resistance < 0,05 Ω		N/A
24.7 (4.28)	Fixing of thermal sensing control		N/A
	Not plug-in or easily replaceable type		N/A
	Reliably kept in position		N/A
	No adhesive fixing if UV radiations from a lamp can degrade the fixing		N/A
	Not outside the luminaire enclosure		N/A
	Test of adhesive fixing:		N/A
	Max. temperature on adhesive material (°C) :		—
	100 cycles between t min and t max		N/A
	Temperature sensing control still in position		N/A
24.7 (4.29)	Luminaires with non-replaceable light source		N/A
	Not possible to replace light source		N/A
	Live part not accessible after parts have been opened by hand or tools		N/A
24.7 (4.30)	Luminaires with non-user replaceable light source		P
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		P
	At least one fixing means requiring use of tool		P
24.7 (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
24.7 (4.31.1)	SELV or PELV circuits		N/A
	Used SELV/PELV source		N/A
	Voltage ≤ ELV		N/A
	Insulating of SELV/PELV circuits from LV supply		N/A
	Insulating of SELV/PELV circuits from other non SELV/PELV circuits		N/A
	Insulating of SELV/PELV circuits from FELV		N/A
	Insulating of SELV/PELV circuits from other SELV/PELV circuits		N/A





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Clause	Requirement + Test	Result - Remark	Verdict
	SELV/PELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to make any electrical contact with socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Plugs and socket-outlets does not have protective conductor contact		N/A
24.7 (4.31.2)	FELV circuits		N/A
	Used FELV source		N/A
	Voltage $\leq$ ELV		N/A
	Insulating of FELV circuits from LV supply		N/A
	FELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to make any electrical contact with socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Socket-outlets does not have protective conductor contact		N/A
24.7 (4.31.3)	Other circuits		N/A
	Other circuits insulated from accessible parts according Table X.1		N/A
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		N/A
	- conductive parts are connected together		N/A
	- test according 7.2.3		N/A
	- conductive part not cause an electric shock in case of an insulation fault		N/A
	- equipotential bonding in master/slave applications		N/A
	- master luminaire provided with terminal for accessible conductive parts of slave luminaires		N/A
	- slave luminaire constructed as class I		N/A
24.7 (4.32)	Overvoltage protective devices		N/A
	Comply with IEC 61643-11		N/A





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Clause	Requirement + Test	Result - Remark	Verdict
	External to controlgear and connected to earth:		N/A
	- only in fixed luminaires		N/A
	- only connected to protective earth		N/A
24.7 (4.33)	Luminaire powered via information technology communication cabling		N/A
	Requirements for Class III luminaire		N/A
	Rated voltage within the range of ES1 and does not exceed maximum voltage of used connector		N/A
	Luminaire does not create any hazard from overvoltage	(see Annex 2)	N/A
24.7 (4.34)	Electromagnetic fields (EMF)		P
	No harmful electromagnetic fields		P
24.7 (4.35)	Protection against moving fan blades		N/A
	Test with a standard test finger		N/A
	Test with test probe acc. to Figure 13 (IEC 61032) for portable luminaire		N/A
	Blades rounded with radius ≥ 0.5 mm and:		N/A
	-hardness less than D60 Shore		N/A
	-peripheral speed less than 15 m/s		N/A
	-input power of fan ≤ 2 W at rated voltage		N/A
24.7 (4.36)	Track-mounted luminaires		N/A
	Test in accordance with Annex A of IEC60570:2003/AMD2:2019		N/A
24.7.1 (-)	Degree of protection		P
	IP4X at least	Yes ☐ No ☐	—
	IP5X if presence of dust	Yes ☐ No ☐	—
	IP6X if presence of conductive dust	Yes ☒ No ☐	—
	At least IP 5X or IP6X for certain locations according IEC 60364-4-42		P
24.7.2 (-)	Applicable surfaces comply with requirements of horizontal surfaces		P
	Vertical surfaces not complying with spacing requirements in 24.13 comply with the limits for horizontal surfaces		P
24.8 (11)	CREEPAGE DISTANCES AND CLEARANCES		P





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Clause	Requirement + Test	Result - Remark	Verdict
24.8 (11.2.1)	Impulse withstand category (Normal category II)	Category II ☒ Category III ☐	—
	Category III according Annex U		N/A
	Protected against pollution, reduced creepage and clearance according Annex P of IEC 61347-1		N/A
24.8 (11.2.2)	Creepage distances for frequency up to 30 kHz	See Test Table 24.8 (11.2) I	P
	Creepage distances for frequency over 30 kHz:		N/A
	- Controlgear marked with $\hat{U}_{OUT}$ and f_{UOUT} according IEC 61347-1, clause 7.1, item w	See Test Table 24.8 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 24.8 (11.2) II	N/A
24.8 (11.2.3)	Clearances for frequency up to 30 kHz	See Test Table 24.8 (11.2) I	P
	Clearances distances for frequency over 30 kHz:		N/A
	- Controlgear marked with U_P	See Test Table 24.8 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 24.8 (11.2) II	N/A

24.9 (7)	PROVISION FOR EARTHING		P
24.9 (7.2.1 + 7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		P
	Resistance < 0,5 Ω: Max.0.026 Ω		P
	Self-tapping screws used		N/A
	Thread-forming screws		N/A
	Thread-forming screw used in a groove		N/A
	Protective earth makes contact first		P
	Terminal blocks with integrated screwless protective earthing contacts tested according Annex V		N/A
	Protective earthing of the luminaire not via built-in control gear		P
24.9 (7.2.2 + 7.2.3)	Protective earth continuity in joints, etc.		P
24.9 (7.2.4)	Locking of clamping means		P
	Compliance with 4.7.3		P





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Clause	Requirement + Test	Result - Remark	Verdict
24.9 (7.2.5)	Protective earth terminal integral part of connector socket		N/A
24.9 (7.2.6)	Protective earth terminal adjacent to mains terminals		N/A
24.9 (7.2.7)	Electrolytic corrosion of the protective earth terminal		N/A
24.9 (7.2.8)	Material of protective earth terminal		N/A
	Contact surface bare metal		P
24.9 (7.2.10)	Class II luminaire for looping-in		N/A
	Double or reinforced insulation to functional earth		N/A
24.9 (7.2.11)	Protective earthing core coloured green-yellow		P
	Length of earth conductor		P
24.9 (7.2.12)	PELV circuit connected to protective earth for functional purpose		N/A

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

24.10 (15)	SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS		P
	Separately approved; component list.....	(see Annex 1)	P
	Part of the luminaire.....	(see Annex 4)	N/A

24.11 (5)	EXTERNAL AND INTERNAL WIRING		P
24.11 (5.2)	Supply connection and external wiring		P
24.11 (5.2.1)	Means of connection.....	Supply cord	P
	Outdoor luminaire has not PVC insulated external wiring if not Class III or SELV/PELV circuits ≤ 25 V AC/60 V DC/25 V peak interrupted DC voltage with frequency 10Hz -200 Hz or protected from outdoor environment		N/A
24.11 (5.2.2)	Type of cable.....	See ANNEX 1	P
	Nominal cross-sectional area (mm ²).....	See ANNEX 1	P
	Cables equal to IEC 60227 or IEC 60245		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
24.11 (5.2.3)	Type of attachment, X, Y or Z		P
24.11 (5.2.5)	Type Z not connected to screws		N/A
24.11 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
24.11 (5.2.7)	Cable entries through rigid material have rounded edges		N/A
24.11 (5.2.8)	Insulating bushings:		N/A
	- suitably fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- tubes or guards made of insulating material		N/A
24.11 (5.2.9)	Locking of screwed bushings		N/A
24.11 (5.2.10)	Cord anchorage:		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
24.11 (5.2.10.1)	Cord anchorage for type X attachment:		N/A
	a) at least one part fixed		N/A
	b) types of cable		N/A
	c) no damaging of the cable		N/A
	d) whole cable can be mounted		N/A
	e) no touching of clamping screws		N/A
	f) metal screw not directly on cable		N/A
	g) replacement without special tool		N/A
	Glands not used as anchorage		N/A





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Clause	Requirement + Test	Result - Remark	Verdict
	Labyrinth type anchorages		N/A
24.11 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		P
24.11 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N).....: 60N		P
	- torque test: torque (Nm).....: 0.25Nm		P
	- displacement ≤ 2 mm	1.2mm	P
	- no movement of conductors		P
	- no damage of cable or cord		P
	- function independent of electrical connection		P
24.11 (5.2.10.4)	Luminaire with/ designed for use with supply cord with maximum current of 2A:		N/A
	- Ordinary Class III luminaire supplied with SELV ≤ 25 V RMS/60V DC		N/A
	- Ordinary Class III luminaire supplied with PELV ≤ 12 V RMS/30V DC		N/A
	- Other than ordinary Class III luminaire supplied with voltage ≤ 12 V RMS/30V DC		N/A
	Pull test of 30N		N/A
24.11 (5.2.11)	External wiring passing into luminaire		P
24.11 (5.2.12)	Looping-in terminals		N/A
24.11 (5.2.13)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N/A
24.11 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A
24.11 (5.2.15)	Connectors for Class III luminaires (IEC 60603 or IEC 62680)		N/A
24.11 (5.2.16)	Appliance inlets (IEC 60320)		N/A





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Clause	Requirement + Test	Result - Remark	Verdict
	Installation couplers (IEC 61535)		N/A
	Appliance inlet or connector systems (IEC 61984)		N/A
24.11 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
24.11 (5.2.18)	Used plug in accordance with		N/A
	- IEC 60083		N/A
	- other standard		N/A
24.11 (5.3)	Internal wiring		P
24.11 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		N/A
	- not delivered/ mounting instruction		N/A
	- factory assembled		N/A
	- socket outlet loaded (A).....:		N/A
	- temperatures.....: (see Annex 2)		P
	Green-yellow for protective earth only		N/A
24.11 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P
	Cross-sectional area (mm ²).....:	See ANNEX 1	P
	Insulation thickness (mm)		P
	Extra insulation added where necessary		N/A
24.11 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		P
	Cross-sectional area (mm ²).....:		P
24.11 (5.3.1.3)	Double or reinforced insulation for class II		N/A
24.11 (5.3.1.4)	Conductors without insulation		N/A
24.11 (5.3.1.5)	SELV/PELV current-carrying parts		N/A
24.11 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
24.11 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N/A





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Clause	Requirement + Test	Result - Remark	Verdict
	Joints, raising/lowering devices		N/A
	Telescopic tubes etc.		N/A
	No twisting over 360°		P
24.11 (5.3.3)	Insulating bushings:		N/A
	- suitable fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- cables with protective sheath		N/A
24.11 (5.3.4)	Joints and junctions effectively insulated		N/A
24.11 (5.3.5)	Strain on internal wiring		N/A
24.11 (5.3.6)	Wire carriers		N/A
24.11 (5.3.7)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		P
24.11 (5.4)	Test to determine suitability of conductors having a reduced cross-sectional area		N/A
	Under test the temperature of the luminaire wiring insulation not exceed the limits stated in Table 12.2	(see Annex 2)	N/A
	No damage to luminaire wiring after test		N/A
24.12 (8)	PROTECTION AGAINST ELECTRIC SHOCK		P
24.12 (8.2.1)	Live parts not accessible		P
	Basic insulated parts not used on the outer surface without appropriate protection		P
	Basic insulated parts not accessible with standard test finger on portable, settable and adjustable luminaires		N/A
	Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires		P
	Lamp and starter holders in portable and adjustable luminaires comply with double or reinforced insulation requirements		N/A





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Clause	Requirement + Test	Result - Remark	Verdict
	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
24.12 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
24.12 (8.2.3.a)	Class II luminaire:		N/A
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A
	- basic insulation not accessible other than during starter or lamp replacement		N/A
	- glass protective shields not used as supplementary insulation		N/A
24.12 (8.2.3.b)	BC lamp holder of metal in class I luminaires shall be connected to protective earth		N/A
24.12 (8.2.3.c)	SELV circuits with exposed current carrying parts:		N/A
	Ordinary luminaire:		N/A
	- voltage under load/ no-load AC (V).....:		N/A
	- voltage under load/ no-load DC (V).....:		N/A
	- interrupted DC voltage (V).....:		N/A
	- touch current if applicable (mA)		N/A
	One conductive part insulated if required		N/A
	Other than ordinary luminaire:		N/A
	- voltage under load/ no-load AC (V).....:		N/A
	- voltage under load/ no-load DC (V).....:		N/A
	- interrupted DC voltage (V).....:		N/A
	Class III luminaire only for connection to SELV		N/A
	Class III luminaire not provided with means for protective earthing		N/A





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Clause	Requirement + Test	Result - Remark	Verdict
24.12 (8.2.3.d)	PELV circuits with exposed current carrying parts:		N/A
	Ordinary luminaire:		N/A
	- voltage under load/ no-load AC (V).....:		N/A
	- voltage under load/ no-load DC (V).....:		N/A
	Other than ordinary luminaire:		N/A
	- voltage under load/ no-load AC (V).....:		N/A
	- voltage under load/ no-load DC (V).....:		N/A
	One pole insulated if required		N/A
24.12 (8.2.4)	Portable luminaire has protection independent of supporting surface		N/A
24.12 (8.2.5)	Compliance with the standard test finger or relevant probe		P
24.12 (8.2.6)	Covers reliably secured		P
24.12 (8.2.7)	Luminaire other than below with capacitor > 0,5 μ F not exceed 50 V 1 min after disconnection	0V	P
	Portable luminaire with capacitor > 0,1 μ F (0.25) not exceed 34 V 1 s after disconnection		N/A
	Other luminaires with capacitor > 0,1 μ F (0.25) with plug and track adaptors not exceed 60 V 5 s after disconnection		N/A

24.13 (12)	ENDURANCE TEST AND THERMAL TEST		P
24.13 (-)	Test of (12.4), (12.5), (12.6) and (12.7) after (9.2) before (9.3) as specified in 24.14		—
24.13 (12.2)	Selection of lamps and ballasts		—
	Lamp used according Annex B	(Lamp used see Annex 2)	—
	Control gear if separate and not supplied	(Control gear used see Annex 2)	—
24.13 (12.3)	Endurance test		P
	a) mounting- position	As normal used	—
	b) test temperature (°C).....	45°C+10°C	—
	c) total duration (h)	240h	—
	d) supply voltage (V).....	1.1x240V	—
	d) if not equipped with control gear, constant voltage/current (V) or (A)		—





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Clause	Requirement + Test	Result - Remark	Verdict
24.13 (12.3.1d)	d) Class III luminaires powered via information technology communication cable:		P
	- voltage under normal operation (V).....:		—
	- voltage under abnormal operation (V).....:		—
	e) luminaire ceases to operate		—
	f) luminaire with constant light output function		N/A
24.13 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N/A
	- marking legible		P
	- no cracks, deformation etc.		P
24.13 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
24.13 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	N/A
24.13 (12.6)	Thermal test (failed lamp control gear condition):		N/A
24.13 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A)		—
	- case of abnormal conditions.....:		—
	- electronic lamp control gear		N/A
	- measured winding temperature (°C): at 1,1 Un:		—
	- measured mounting surface temperature (°C) at 1,1 Un		N/A
	- calculated mounting surface temperature (°C)		N/A
	- track-mounted luminaires		N/A
24.13 (12.6.2)	Temperature sensing control		N/A
	- case of abnormal conditions.....:		—
	- thermal link		N/A
	- manual reset cut-out		N/A
	- auto reset cut-out		N/A
	- measured mounting surface temperature (°C)		N/A
	- track-mounted luminaires		N/A
24.13 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N/A





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Clause	Requirement + Test	Result - Remark	Verdict
24.13 (12.7.1)	Luminaire without temperature sensing control		N/A
24.13 (12.7.1.1)	Luminaire with fluorescent lamp $\leq 70W$		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 ($^{\circ}C$): at 1,1 Un.....		—
	- measured temperature of fixing point/exposed part ($^{\circ}C$): at 1,1 Un.....		—
	- calculated temperature of fixing point/exposed part ($^{\circ}C$).....		—
	Ball-pressure test.....	See Test Table 24.16 (13.2.1)	N/A
24.13 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp $> 70W$, transformer $> 10 VA$		N/A
	- case of abnormal conditions.....		—
	- measured winding temperature ($^{\circ}C$): at 1,1 Un.....		—
	- measured temperature of fixing point/exposed part ($^{\circ}C$): at 1,1 Un.....		—
	- calculated temperature of fixing point/exposed part ($^{\circ}C$).....		—
	Ball-pressure test.....	See Test Table 24.16 (13.2.1)	N/A
24.13 (12.7.1.3)	Luminaire with short circuit proof transformers $\leq 10 VA$		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
24.13 (12.7.2)	Luminaire with temperature sensing control		N/A
	- thermal link.....	Yes ☐ No ☐	—





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Clause	Requirement + Test	Result - Remark	Verdict
	- 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 Test Table 24.16 (13.2.1)	N/A
24.13 (-)	Temperature limit for vertical surfaces with gap < 30 mm	(see Annex 2)	N/A
24.13.1 (-)	Special temperature limits – normal operation	(see Annex 2)	N/A
24.13.2 (-)	Special temperature limits – abnormal operation	(see Annex 2)	N/A
24.13.3 (-)	Special temperature limits – fault conditions	(see Annex 2)	N/A
24.14 (9)	RESISTANCE TO DUST AND MOISTURE		P
24.14 (-)	Order of tests as specified in clause 24.13		P
24.14 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP.....: IP65		—
	- mounting position during test.....: Normal installation		—
	- fixing screws tightened; torque (Nm).....: 2/3 torque of cl4.12.1 and 4.12.5		—
	- tests according to clauses.....: Clause 9.2.2 and 9.2.6		—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N/A
	b) no talcum in dust-tight luminaire		P
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		P
	c.1) For luminaires without drain holes – no water entry		P
	c.2) For luminaires with drain holes – no hazardous water entry		N/A
	d) no water in watertight, pressure watertight, high pressure and temperature water jet-proof or high pressure and cold water jet-proof luminaire		N/A
	e) no contact with live parts (IP 2X)		N/A
	e) no entry into enclosure (IP 3X and IP 4X)		N/A
	e) no contact with live parts through drain holes and ventilation slots (IP3X and IP4X)		N/A



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IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
	f) no trace of water on part of lamp requiring protection from splashing water		N/A
	g) no damage of protective shield or glass envelope		N/A
24.14 (9.3)	Humidity test 48 h	93%RH, 25°C, 48h	P

24.15 (10)	INSULATION RESISTANCE AND ELECTRIC STRENGTH		P
24.15 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø		—
	Insulation resistance (MΩ):		P
	SELV/PELV:		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/PELV:		P
	- between live parts of different polarity.....	>100 MΩ	P
	- between live parts and mounting surface.....	>100 MΩ	P
	- between live parts and metal parts.....	>100 MΩ	P
	- between live parts of different polarity through action of a switch.....		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts.....		N/A
	- Insulation bushings as described in Section 5		N/A
24.15 (10.2.2)	Electric strength test		P
	Dummy lamp		N/A
	Luminaires with ignitors after 24 h test		N/A





IEC 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
	Luminaires with manual ignitors		N/A
	Test voltage (V):		P
	SELV/PELV:		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/PELV:		P
	- between live parts of different polarity..... :	1480Vac	P
	- between live parts and mounting surface..... :	1700Vac(Uout:350Vdc)	P
	- between live parts and metal parts..... :	1700Vac(Uout:350Vdc)	P
	- between live parts of different polarity through action of a switch..... :		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :		N/A
	- Insulation bushings as described in Section 5 :		N/A
24.15 (10.3)	Touch current (mA)..... :		N/A
	Protective conductor current (mA)..... :	0.27mA	N/A

24.16 (13)	RESISTANCE TO HEAT, FIRE AND TRACKING		P
24.16 (13.2.1)	Ball-pressure test..... :	See Test Table 24.16 (13.2.1)	P
24.16 (13.3.1)	Needle-flame test (10 s)..... :	See Test Table 24.16 (13.3.1)	P
24.16 (13.3.2)	Glow- wire test (650°C)..... :	See Test Table 24.16 (13.3.2)	P
24.16 (13.4)	Proof tracking test (IEC 60112)..... :	See Test Table 24.16 (13.4)	N/A





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Clause	Requirement + Test	Result - Remark	Verdict

24.8 (11.2)	TABLE I: Creepage distances and clearances						P
	Minimum distances (mm) for a.c. up to 30 kHz sinusoidal voltages						P
	Applicable part of IEC 60598-1 Table 11.1.A*, 11.1.B* and 11.2*						P
	Insulation type **	Measured clearance	Required		Measured creepage	Required	
			clearance	*Table		creepage	*Table
Distance 1:	--	--	--	Table 11.1.B	--	--	Table 11.1.A
Distance 2:	B	>6.0	1.5	Table 11.1.B	>6.0	2.5	Table 11.1.A
Distance 3:	B	5.27	3.0	Table 11.1.B	5.27	3.5	Table 11.1.A
Working voltage (V)..... :					240V for input		—
PTI..... :					< 600 ☒ ≥ 600 ☐		—
Pulse voltage or U_P if applicable (kV) :					--		—
Supplementary information:							
Distance 1: Approved AC connector and LED driver used.							
Distance 2: Between live part and accessible metal parts.							
Distance 3: Between printed circuit of LED PCB and metal surface of luminaire(U_{out} :350Vdc)							

** Insulation type: B – Basic; S – Supplementary; R – Reinforced. See also IEC 60598-1 Annex M.





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

24.16 (13.2.1)	TABLE: Ball Pressure Test of Thermoplastics			P
Allowed impression diameter (mm):		2		—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
Closed-end connector	See Annex 1	125°C	1.4mm	
PCB	See Annex 1	125°C	1.2mm	
Supplementary information:				

24.16 (13.3.1)	TABLE: Needle-flame test				P
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Closed-end connector	See Annex 1	10s	No	0s	P
PCB	See Annex 1	10s	No	0s	P
Supplementary information:					

24.16 (13.3.2)	TABLE: Resistance to heat and fire - Glow wire tests						P
Object/ Part No./ Material	Manufacturer/ trademark	Glow wire test (°C)					Verdict
		650		750		850	
		te	ti	te	ti		
Closed-end connector	See Annex 1	0s	0s	--	--	--	P
PCB	See Annex 1	0s	0s	--	--	--	P
Ignition of the specified layer placed underneath the test specimen (Yes/No).....:							
Supplementary information:							

24.16 (13.4)	TABLE: Proof tracking test	N/A
-------------------------	-----------------------------------	------------





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Clause	Requirement + Test			Result - Remark		Verdict
Test voltage PTI :				175 V		—
Object/ Part No./ Material		Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
--		--	--	--	--	--
Supplementary information:						



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

ANNEX 1		TABLE: Critical components information					--
Object / part No.	Code	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾	
AC connector	B	Shenzhen Lilutong Connector Corp.,Ltd	LLT-M15-15005M115Y	250V~, 15A, IP67, 105°C	EN 61984	TUV No.B090230 0010 Rev.00	
Supply cord	B	Guangdong Rifeng Electrical Cable Co.,Ltd	H07RB-F	5*1.0mm ² , 450/750V	DIN EN 50525-2-21	VDE 40015999	
Close end connector	C	HEAVY POWER CO LTD	CE1	PC	--	UL E113650	
LED driver	B	Signify Netherlands B.V.	Xi LP 200W 0.3-1.05A S1 WL I165	Input: 100-277V~, 50/60Hz, 1.2-0.8A Output: 142-286Vdc, Uout:350Vdc 0.3-1.05A, max.200W, ta.55°C, tc.85°C	IEC 61347-1 IEC 61347-2-13	NL-109286	
LED driver	B	Signify Netherlands B.V.	Xi LP 150W 0.3-1.05A S1 WL I175	Input: 100-277V~, 50/60Hz, 0.85-0.65A Output: 71-214Vdc, Uout:320Vdc 0.3-1.05A, max.150W, ta.50°C, tc.85°C	IEC 61347-1 IEC 61347-2-13	DEKRA 6141603.50	
LED driver	B	Signify Netherlands B.V.	Xi LP 100W 0.3-1.05A S1 WL I155	Input: 100-277V~, 50/60Hz, 0.58-0.45A Output: 46-143Vdc, Uout:220Vdc 0.3-1.05A, max.100W, ta.55°C, tc.80°C	IEC 61347-1 IEC 61347-2-13	DEKRA 6141603.50	
Earthing wire	C	Shenzhen Jiahuida Electronics Co Ltd	1007	105°C, 600 V, 20AWG	--	UL E361915	
Internal wire	C	WUXI VIGOROUS ELECTRIC CO LTD	1015	105°C, 600 V, 22AWG	--	UL E318424	



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Clause	Requirement + Test			Result - Remark		Verdict

PCB	C	FOSHAN TIAN QI CIRCUIT BOARD CO LTD	TQ-1	90°C, V-0	--	UL E469500
CCT switch	B	China Zhejiang Jialong Electron Co.,Ltd	SS-12	250V~, 3A	IEC 61058-1	VDE 40022327
Input wire of LED	C	WUXI VIGOROUS ELECTRIC CO LTD	1015	105°C, 600 V, 22AWG	--	UL E318424
LED PCB	C	FOSHAN TIAN QI CIRCUIT BOARD CO LTD	TQM-1 TQM-2	130°C, V-0	--	UL E469500
LED	C	Shenzhen Runlite Technology co.,Ltd	P28351- W27SK3K4FG 0G3-LX00	110mA, 8.8-9.8V	IEC 62031 IEC TR62778	Tested 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



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Clause	Requirement + Test	Result - Remark	Verdict
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ANNEX 2	TABLE: Thermal tests of Section 12		P
	Type reference.....:	BHBEX200C120DP	—
	Lamp used.....:	LED module	—
	Lamp control gear used.....:	Xi LP 200W 0.3-1.05A S1 WL I165	—
	Mounting position of luminaire.....:	According to instruction from manufacturer	—
	Supply wattage (W)	195.7W	—
	Supply current (A)	0.805A	—
	Calculated power factor.....:	0.955	—
	Temperatures in test 1 - 4 below are corrected for ta (°C)	45°C	—
	- abnormal operating mode.....:		—
1.13 (12.4)	- test 1: rated voltage		—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current	1.06x240V~	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage.....:		—
	Through wiring or looping-in wiring loaded by a current of A during the test		—
1.13 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current or 130/150% of rated input voltage.....:		—

Temperature measurements (°C)

Part	Ambient	Cl. 12.4 – normal				Cl. 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Supply cord	45	--	52.1	--	90	--	--
Input wire of LED driver	45	--	73.9	--	90	--	--
Tc of driver	45	--	83.2	--	85	--	--
PCB of CCT switch	45	--	65.9	--	90	--	--
CCT switch	45	--	62.7	--	Ref.	--	--
Close end connector	45	--	66.9	--	Ref.	--	--
Wire near LED	45	--	72.6	--	105	--	--
LED PCB	45	--	78.4	--	130	--	--



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

Glass cover	45	--	63.8	--	Ref.	--	--
Mounting surface	45	--	60.8	--	90	--	--
Horizontal side of enclosure	45	--	69.4	--	90	--	--
Vertical side of enclosure	45	--	64.7	--	150	--	--
Vertical side of enclosure which near the wall	45	--	62.9	--	90	--	--

Supplementary information:

ANNEX 2	TABLE: Thermal tests of Section 12		P
	Type reference.....:	BHB150C120DP	—
	Lamp used.....:	LED module	—
	Lamp control gear used.....:	Xi LP 150W 0.3-1.05A S1 WL I175	—
	Mounting position of luminaire.....:	According to instruction from manufacturer	—
	Supply wattage (W)	152.7W	—
	Supply current (A)	0.624A	—
	Calculated power factor.....:	0.962	—
	Temperatures in test 1 - 4 below are corrected for ta (°C)	45°C	—
	- abnormal operating mode.....:		—
1.13 (12.4)	- test 1: rated voltage		—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current	1.06x240V~	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage.....:		—
	Through wiring or looping-in wiring loaded by a current of A during the test		—
1.13 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current or 130/150% of rated input voltage.....:		—

Temperature measurements (°C)

Part	Ambient	Cl. 12.4 – normal				Cl. 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Supply cord	45	--	50.3	--	90	--	--
Tc of driver	45	--	78.4	--	85	--	--



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IEC 60598-2-24							
Clause	Requirement + Test			Result - Remark			Verdict
Mounting surface	45	--	57.3	--	90	--	--
Horizontal side of enclosure	45	--	59.4	--	90	--	--
Vertical side of enclosure	45	--	57.2	--	150	--	--
Vertical side of enclosure which near the wall	45	--	52.1	--	90	--	--
Supplementary information:							

ANNEX 2	TABLE: Thermal tests of Section 12		P				
	Type reference.....	BHB100C120DP	—				
	Lamp used.....	LED module	—				
	Lamp control gear used.....	Xi LP 100W 0.3-1.05A S1 WL I155	—				
	Mounting position of luminaire.....	According to instruction from manufacturer	—				
	Supply wattage (W)	99.8W	—				
	Supply current (A)	0.412A	—				
	Calculated power factor.....	0.952	—				
	Temperatures in test 1 - 4 below are corrected for ta (°C)	45°C	—				
	- abnormal operating mode.....		—				
1.13 (12.4)	- test 1: rated voltage		—				
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current	1.06x240V~	—				
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage.....		—				
	Through wiring or looping-in wiring loaded by a current of A during the test		—				
1.13 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current or 130/150% of rated input voltage.....		—				
Temperature measurements (°C)							
Part	Ambient	Cl. 12.4 – normal				Cl. 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Supply cord	45	--	48.5	--	90	--	--
Tc of driver	45	--	65.8	--	80	--	--
Mounting surface	45	--	53.8	--	90	--	--



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IEC 60598-2-24							
Clause	Requirement + Test			Result - Remark			Verdict
Horizontal side of enclosure	45	--	55.9	--	90	--	--
Vertical side of enclosure	45	--	51.4	--	150	--	--
Vertical side of enclosure which near the wall	45	--	49.8	--	90	--	--
Supplementary information:							



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Clause	Requirement + Test	Result - Remark	Verdict
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ANNEX 3	Screw terminals (part of the luminaire)		N/A
(14)	SCREW TERMINALS		N/A
(14.2)	Type of terminal.....:		—
	Rated current (A).....:		—
(14.3.2.1)	One or more conductors		N/A
(14.3.2.2)	Special preparation		N/A
(14.3.2.3)	Terminal size		N/A
	Cross-sectional area (mm ²).....:		—
(14.3.3)	Conductor space (mm).....:		N/A
(14.4)	Mechanical tests		N/A
(14.4.1)	Minimum distance		N/A
(14.4.2)	Cannot slip out		N/A
(14.4.3)	Special preparation		N/A
(14.4.4)	Nominal diameter of thread (metric ISO thread).....:	M	N/A
	External wiring		N/A
	No soft metal		N/A
(14.4.5)	Corrosion		N/A
(14.4.6)	Nominal diameter of thread (mm).....:		N/A
	Torque (Nm).....:		N/A
(14.4.7)	Between metal surfaces		N/A
	Lug terminal		N/A
	Mantle terminal		N/A
	Pull test; pull (N).....:		N/A
(14.4.8)	Without undue damage		N/A





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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 4	Screwless terminals (part of the luminaire)		N/A
(15)	SCREWLESS TERMINALS		N/A
(15.2)	Type of terminal.....:		—
	Rated current (A).....:		—
(15.3.1)	Material		N/A
(15.3.2)	Clamping		N/A
(15.3.3)	Stop		N/A
(15.3.4)	Unprepared conductors		N/A
(15.3.5)	Pressure on insulating material		N/A
(15.3.6)	Clear connection method		N/A
(15.3.7)	Clamping independently		N/A
(15.3.8)	Fixed in position		N/A
(15.3.10)	Conductor size		N/A
	Type of conductor		N/A
(15.5)	Terminals and connections for internal wiring		N/A
(15.5.1)	Mechanical tests		N/A
(15.5.1.1.1)	Pull test spring-type terminals (4 N, 4 samples).....:		N/A
(15.5.1.1.2)	Pull test pin or tab terminals (4 N, 4 samples).....:		N/A
	Insertion force not exceeding 50 N		N/A
(15.5.1.2)	Permanent connections: pull-off test (20 N)		N/A
(15.5.2)	Electrical tests		N/A
	Voltage drop (mV) after 1 h (4 samples).....:		N/A
	Voltage drop of two inseparable joints		N/A
	Number of cycles:		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples).....:		N/A
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples).....:		N/A
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples).....:		N/A
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples).....:		N/A
(15.6)	Terminals and connections for external wiring		N/A
(15.6.1)	Conductors		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	Terminal size and rating		N/A
15.6.2	Mechanical tests		N/A
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N)		N/A
(15.6.2.2)	Pull test pin or tab terminals (4 samples); pull (N)		N/A
(15.6.3)	Electrical tests		N/A
	Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1		N/A

(15.6.3.1) (15.6.3.2)	TABLE: Contact resistance test / Heating tests										N/A
	Voltage drop (mV) after 1 h										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Voltage drop of two inseparable joints										
	Voltage drop after 10th alt. 25th cycle										
	Max. allowed voltage drop (mV).....:										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Voltage drop after 50th alt. 100th cycle										
	Max. allowed voltage drop (mV).....:										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Continued ageing: voltage drop after 10th alt. 25th cycle										
	Max. allowed voltage drop (mV).....:										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Continued ageing: voltage drop after 50th alt. 100th cycle										
	Max. allowed voltage drop (mV).....:										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											





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Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:



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Clause	Requirement + Test	Result - Remark	Verdict

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

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

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



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

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

6	TABLE: Measurement results with Van der Hoofden test head					N/A
Location of EUT		Test model	Measuring distance	Result(F)	Limit(F)	Verdict
Reference Annex B of IEC/EN 62493:2015+A1:2022		--	--	--	≤1.0	N/A





Attachment No.1

IEC60598_2_24H - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

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

Differences according to..... : EN 60598-2-24:2013 used in conjunction with
EN IEC 60598-1:2021+A11:2022

	CENELEC COMMON MODIFICATIONS (EN)	P
24.6 (3)	MARKING	P
24.6 (3.2.12)	Delete note 4	P
24.7 (4)	CONSTRUCTION	N/A
24.7 (4.11.6)	Electro-mechanical contact systems: electric strength test at 1 500 V	N/A
24.11 (5)	EXTERNAL AND INTERNAL WIRING	N/A
24.11 (5.2.2)	Cables equal to EN 50525 (all parts)	N/A
24.11 (5.2.2)	Delete paragraph 2	N/A
	Replace table 5.1 – Supply cord	N/A
24.13 (12)	ENDURANCE TEST AND THERMAL TEST	P
24.13 (12.4.2c)	Thermal test (normal operation) see footnote c to table 12.2 relating to unsleeved fixed wiring	P
ZB	ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)	N/A
(3.3)	DK: power supply cords of class I luminaires with label	N/A
(5.2.1)	CY, DK, FI, UK: type of plug	N/A
(5.2.18)	DK: socket-outlets	N/A





Attachment No.1

IEC60598_2_24H - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
ZC	ANNEX ZC, NATIONAL DEVIATIONS (EN)		N/A
(4 & 5)	FR: Shuttered socket-outlets 10/16A		N/A
	FR: Safety requirements for high buildings (Decree of 30 December 2011 on safety regulations for the construction of high-rise buildings and their protection against fire and panic risks; Section VIII; Article GH 48, Lighting) 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
	UK: Requirements according to United Kingdom Building Regulation		N/A





Attachment No.2

IEC/EN IEC 62031 LED modules for general lighting - Safety specifications			
Clause	Requirement + Test	Result - Remark	Verdict
4.2	Classification		---
	Built-in.....:	Yes ☐ No ☒	—
	Independent.....:	Yes ☐ No ☒	—
	Integral.....:	Yes ☒ No ☐	—
4.6	Independent modules comply with requirements in IEC 60598-1:2020		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.	(see Annex 1)	N/A
6	Marking		N/A
6.2	Contents of marking for built-in and for independent LED modules		N/A
6.3	Location of marking for built-in LED modules		N/A
6.4	Location of marking for independent LED modules		N/A
6.5	Marking of integral LED modules		P
6.6	Durability and legibility of marking		N/A
7	Terminals		N/A
8 (9)	EARTHING		N/A
9 (10)	Protection against accidental contact with live parts		N/A
10 (11)	Moisture resistance and insulation		P
11 (12)	Electric strength		P*
12 (14)	Fault conditions		P
12.1	Fault conditions according to IEC 61347-1, Clause 14		P
12.2	Overpower condition	No damage	P
14 (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



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Attachment No.2

IEC/EN IEC 62031 LED modules for general lighting - Safety specifications			
Clause	Requirement + Test	Result - Remark	Verdict
15 (16)	Creepage distances and clearances		N/A
16 (17)	Screws, current-carrying parts and connections		N/A
17 (18)	Resistance to heat, fire and tracking		N/A
18	Resistance to corrosion		N/A
20	Heat management		N/A
22	Photobiological safety		P
22.1	UV radiation		N/A
22.2	Blue light hazard		P
	Assessed according to IEC TR 62778		P
22.3	Infrared radiation		N/A



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Attachment No.3

IEC TR 62778 Photobiological safety of lamps and lamp systems			
Clause	Requirement + Test	Result - Remark	Verdict

Table 4.6 (4.24)		Spectroradiometric measurement (IEC TR 62778: 2014)			--
	Measurement performed on:	Luminaire			--
	Model number	BHBEX200C120DP			--
	Test voltage (V)	240V			--
	Test current (mA)	--			--
	Test frequency (Hz)	50			--
	Ambient, t (°C)	25,0			--
	Measurement distance	☒ 20 cm ☐ ... cm			--
	Source size	☒ Non-small ☐ Small : mm			--
	Field of view	☐ 100 mrad ☒ 11 mrad ☐ 1,7 mrad (for small sources)			--
Item		Symbol	Units	Result	Risk Group
Correlated colour temperature		CCT	K	--	--
x/y colour coordinates		--	--	--	--
Blue light hazard radiance		L _B	W/(m ² •sr ¹)	1409	☐ RG0: <100 ☒ RG1: <10000 ☐ RG2: <4000000
Blue light hazard irradiance		E _B	W/m ²	--	--
Luminance		L	cd/m ²	--	--
Illuminance		E	lx	--	--
Supplementary information:					



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Attachment No.1

Photo Documentation

Model: BHBEX200C120DP



Photo 1



Photo 2





Attachment No.1

Photo Documentation



Photo 3



Photo 4





Attachment No.4

Photo Documentation



Photo 5

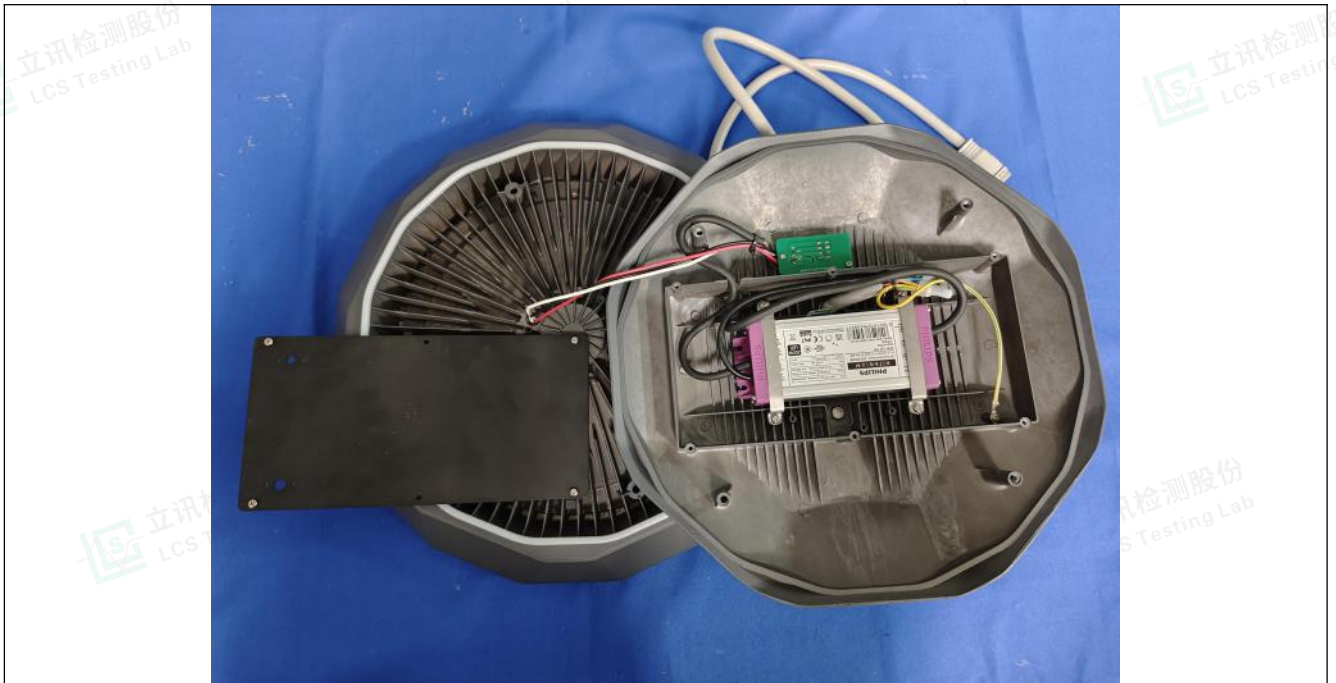


Photo 6





Attachment No.4

Photo Documentation



Photo 7



Photo 8





Attachment No.4

Photo Documentation

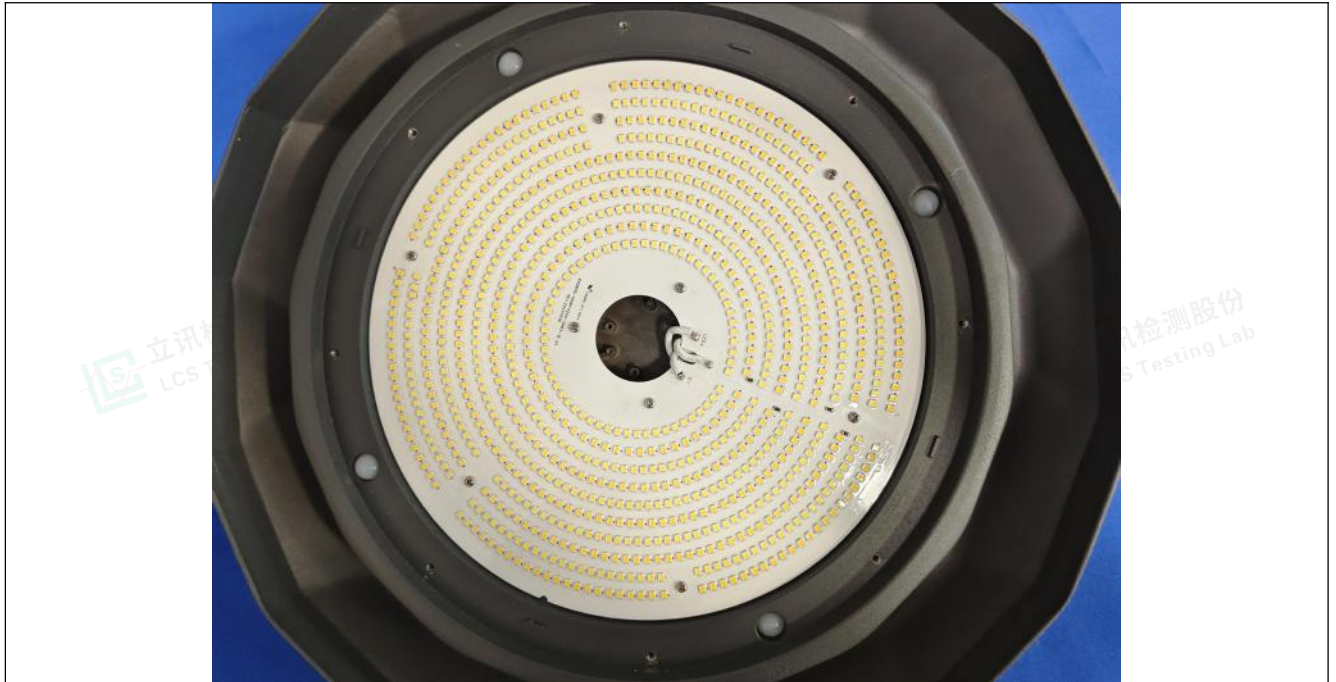


Photo 9



Photo 10



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Attachment No.4

Photo Documentation

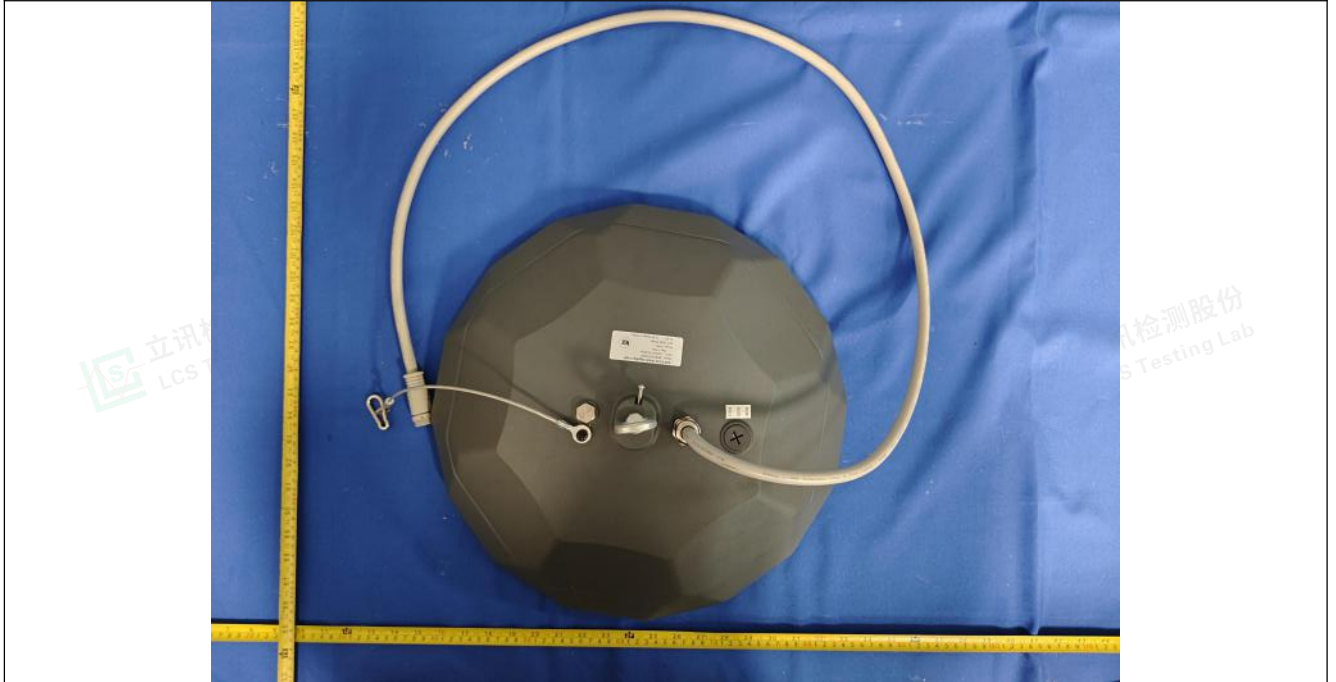


Photo 11



Photo 12





Attachment No.4

Photo Documentation



Photo 13

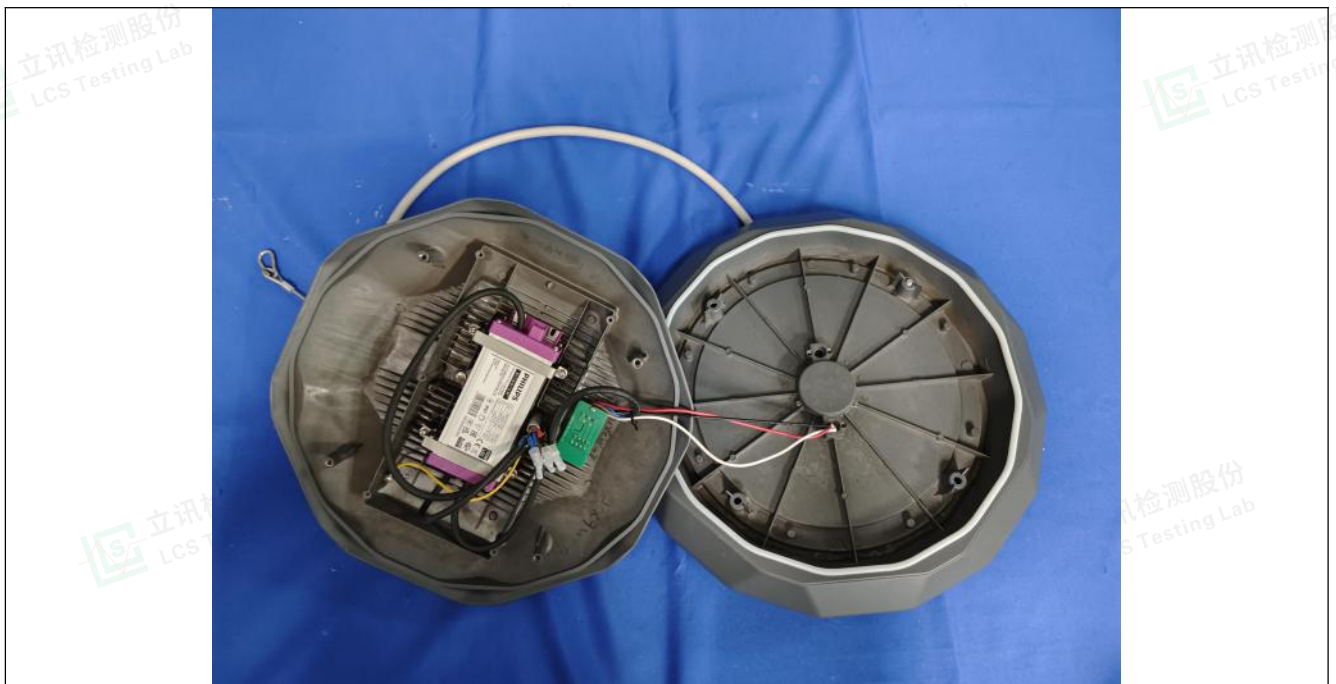


Photo 14





Attachment No.4

Photo Documentation



Photo 15



Photo 16





Attachment No.4

Photo Documentation



Photo 17



Photo 18



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Attachment No.4

Photo Documentation

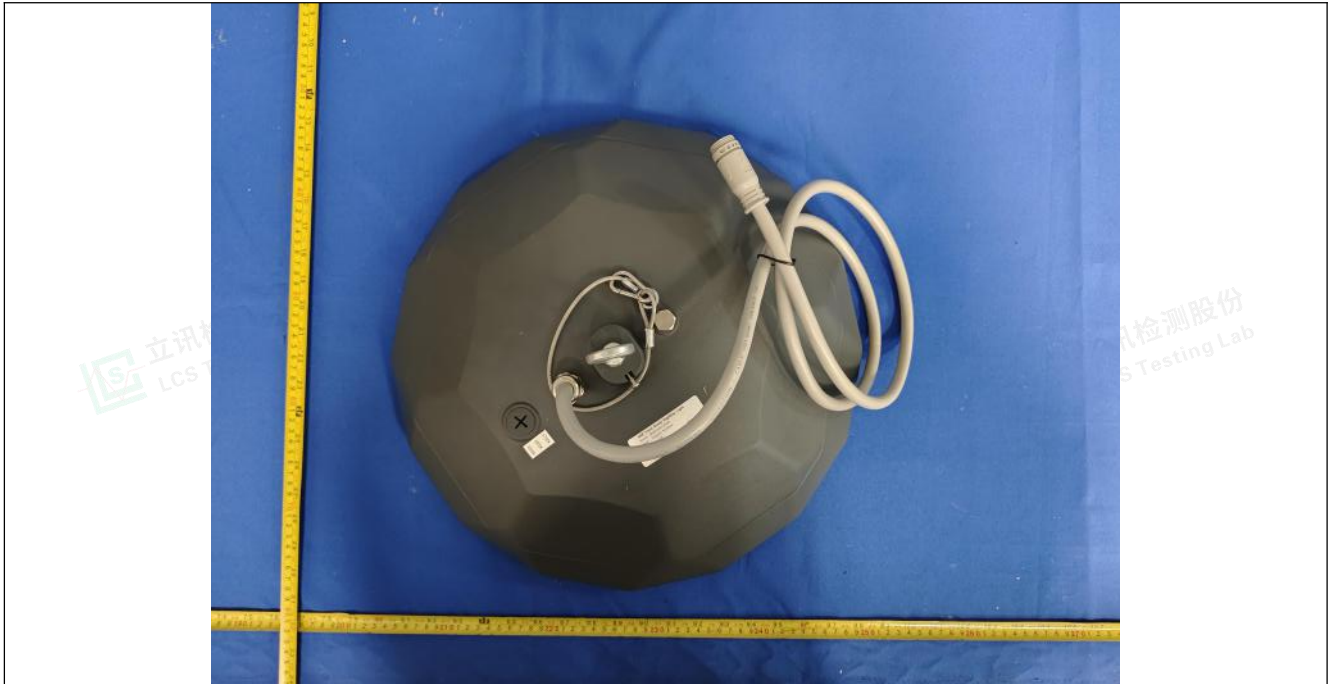


Photo 19



Photo 20





Attachment No.4

Photo Documentation



Photo 21

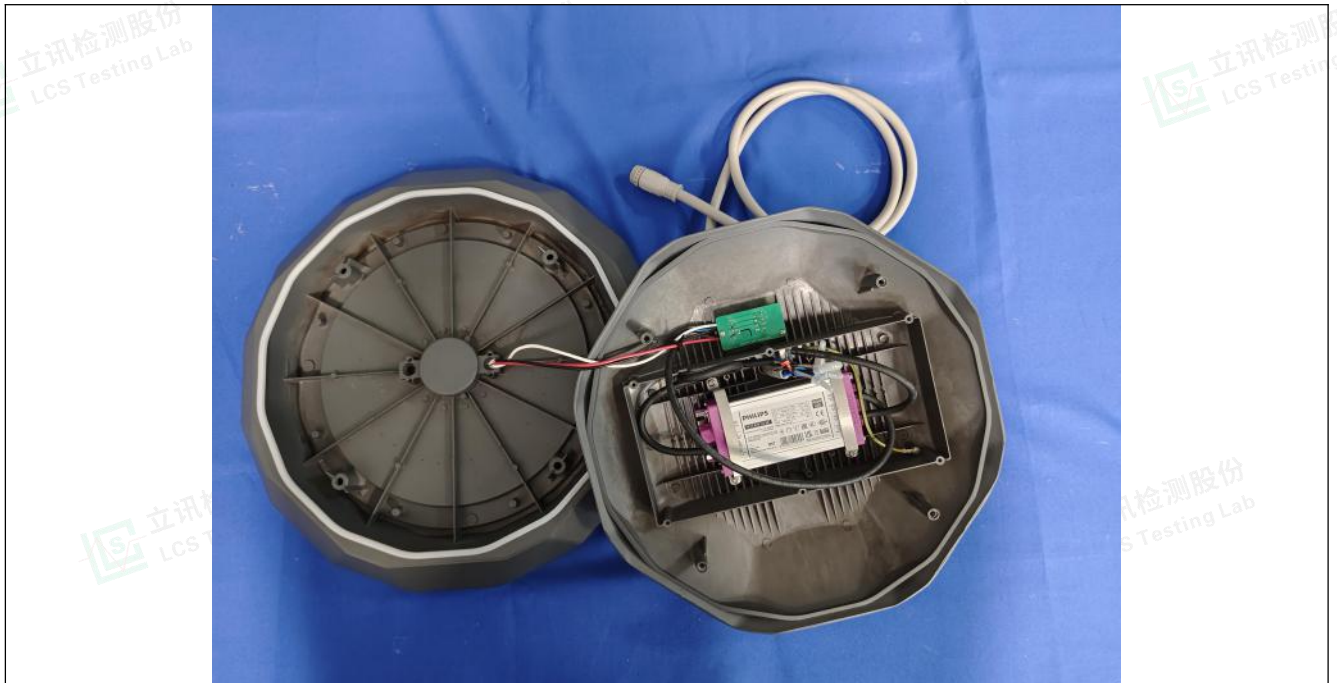


Photo 22





Attachment No.4

Photo Documentation



Photo 23



Photo 24





Attachment No.4

Photo Documentation

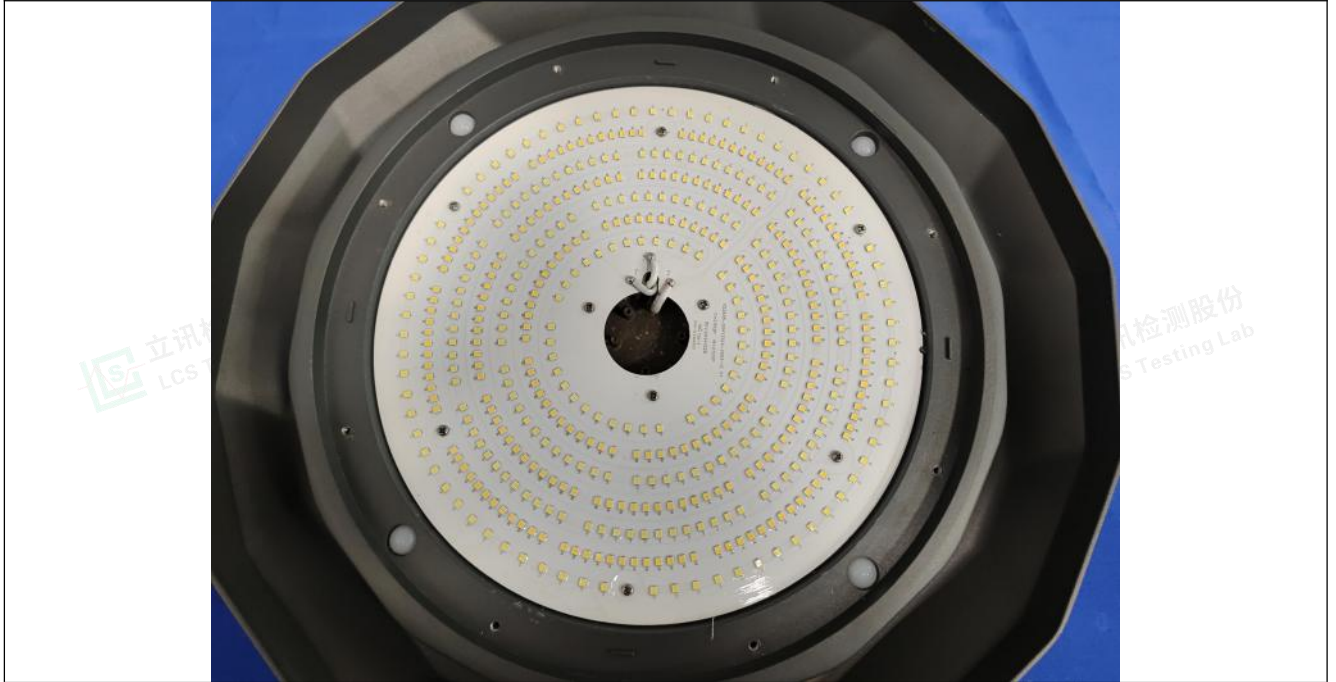


Photo 25

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



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