TEST REPORT
IEC 60598-2-3
Luminaires
Part 2: Particular requirements
Section 3: Luminaires for road and street lighting

Report Number..... :	68.140.23.0576.01
Date of issue ..... :	2023-10-20
Total number of pages.....	46 (not including attachments)
Name of Testing Laboratory preparing the Report ..... :	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Applicant's name..... :	Shenzhen Unicorn Lighting Co., Ltd.
Address..... :	6F, Rong Chuang intelligent Bld. A, Longsheng Road, Shangfen, Minzhi, Longhua District, 518110 Shenzhen, PEOPLE'S REPUBLIC OF CHINA
Test specification:	
Standard..... :	IEC 60598-2-3:2002, IEC 60598-2-3:2002/AMD1:2011 used in conjunction with IEC 60598-1:2020
Test procedure..... :	CE_LVD
Non-standard test method..... :	N/A
TRF template used..... :	IECEE OD-2020-F1:2021, Ed.1.4
Test Report Form No. ..... :	IEC60598_2_3M
Test Report Form(s) Originator.... :	Intertek Semko AB
Master TRF..... :	2021-11-11

This report is not valid as a CB Test Report unless signed by an approved IECEE Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
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Test item description..... :	Luminaires for road and street lighting (LED Street Light)
Trade Mark(s)..... :	unicornlite®
Manufacturer..... :	Dongguan Hysone Renewable Energy Co., Ltd. Floor 7, Building 3, No.,96 Qingbin East Road, Qingxi Town, 523648 Dongguan City,Guangdong, PEOPLE'S REPUBLIC OF CHINA
Model/Type reference..... :	ST024P; ST040P; ST050P; ST060P; ST080P; ST100P; ST105P; ST120P; ST150P; ST180P; ST200P; ST240P; ST300P; ST305P; ST024M; ST040M; ST050M; ST060M; ST080M; ST100M; ST105M; ST120M; ST150M; ST180M; ST200M
Ratings..... :	Rated Voltage: 200-240VAC Rated Frequency: 50/60Hz Rated Power: See 'General product information' for details Protection Class: I Degree of Protection: IP66 Blue Light Risk Group: RG1 ta: 40°C

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☒	**Testing Laboratory:**	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch	
Testing location/ address.....:		Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District, Shenzhen, Guangdong 518052, China	
Tested by (name, function, signature).....:		Mike Zhang Project Handler	
Approved by (name, function, signature)...:		Kevin Liu Designated Reviewer	
☐	**Testing procedure: CTF Stage 1:**		
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 2:**		
Testing location/ address.....:			
Tested by (name + signature) .....:			
Witnessed by (name, function, signature)..:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 3:**		
☐	**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):
Attachment No.1:
2 pages of test report for EU Group Differences and National differences for EN 60598-2-3:2003+A1:2011 and EN IEC 60598-1:2021+A11:2022;
Attachment No.2:
19 pages of test report for IEC 62031:2018;
1 page of test report for European group differences and national differences for EN IEC 62031:2020 +A11:2021 (for LED module);
Attachment No.3:
7 pages of test report for IEC TR 62778:2014 (for blue light risk);
Attachment No.4:
12 pages of test report for IEC 62493:2015; IEC 62493:2015/AMD1:2022 (for EMF);
Attachment No.5:
7 pages of test report for Photo documentation.

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
All applicable tests as described in the compliance checklist were performed at ST305P and ST200M.	Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District, Shenzhen, Guangdong 518052, China

Summary of compliance with National Differences:

List of countries addressed:

- European Group difference

The product fulfils the requirements of below standards:

- EN 60598-2-3:2003+A1:2011
- EN IEC 60598-1:2021+A11:2022
- EN 62493:2015+A1:2022

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)

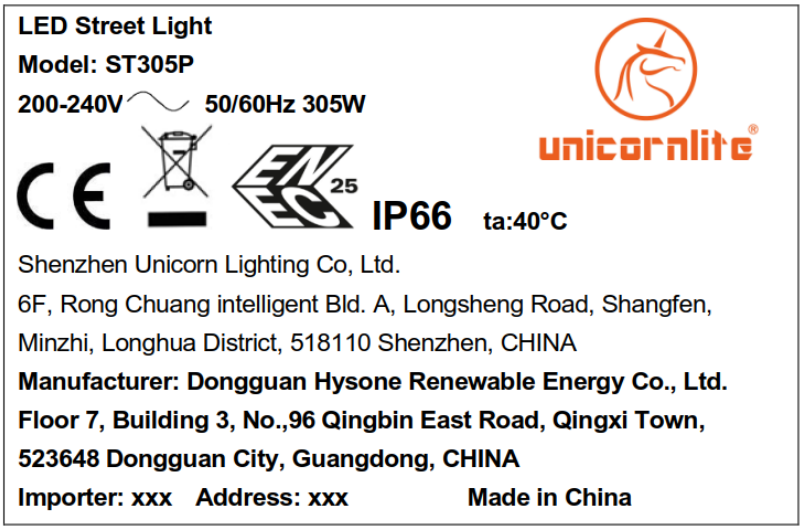
Information on uncertainty of measurement:

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:
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.



Location: Sticking on the metal enclosure.
Remark: The labels for other models are same as the above label except that the model No. and rated power are different.

Remark:

- Height of CE marking at least 5mm, height of WEEE mark at least 7mm, height of other marks at least 5mm, height of letters and numerals at least 2mm.

Test item particulars.....:	LED Street Light
Classification of installation and use .....:	Fixed for outdoor use only
Supply Connection .....:	Supply cord without plug
Protection Class.....:	I
Degree of Protection .....:	IP66
ta .....:	40°C
Blue Light Risk Group .....:	RG1
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 ..... :	See below
Date of receipt of test item..... :	2023-08-10
Date (s) of performance of tests ..... :	2023-08-10 to 2023-10-20

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☒ comma / ☐ point is used as the decimal separator.

Clause numbers between brackets refer to clauses in IEC 60598-1

Name and address of factory (ies) .....:	Dongguan Hysone Renewable Energy Co., Ltd. Floor 7, Building 3, No.,96 Qingbin East Road, Qingxi Town, 523648 Dongguan City,Guangdong, PEOPLE'S REPUBLIC OF CHINA

General product information and other remarks:
The manufacturer/ Importer has to ensure the appliance placing on the EU market conforms to the applicable EU directives which provide the affixing of the CE marking, such as LVD, EMC, RoHS, ErP, and so on.
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.
LED Street Light equipped with non-user replaceable light source is for outdoor use only, the maximum mounting height is 15m.

Model list for LED luminaires:

Model No.	Rated Power (W)	LED driver	LED Qty. (pcs)	Size (L*W*H) (mm) and Weight (kg)	Max. projected area (m^2)	Photo
P series						
ST024P	24	XLG-50-A or SS-50EP-50B	48 or 96	568x200x109; 3,5	0,11	
ST040P	40	XLG-50-A or SS-50EP-50B				
ST050P	50	XLG-50-A or SS-50EP-50B				
ST060P	60	XLG-75-H-A or SS-75EP-56B				
ST080P	80	XLG-100-H-A or SS-100EP-56B	72 or 144	613x240x109; 4,6	0,15	
ST100P	100	XLG-100-H-A or SS-100EP-56B				
ST105P	105	XLG-100-H-A or SS-100EP-56B				
ST120P	120	XLG-150-H-A or SS-150EP-56B				
ST150P	150	XLG-150-H-A or SS-150EP-56B	96 or 192	683x260x109; 5,8	0,18	
ST180P	180	XLG-200-H-A or SS-200EP-56B	128 or 256	693x300x109; 6,1	0,21	
ST200P	200	XLG-200-H-A or SS-200EP-56B				
ST240P	240	XLG-240-H-A or SS-240EP-56B	192 or 384	793x300x109; 7,4	0,24	
ST300P	300	ELGC-300-H-A or XLG-320-H-A or SS-150EP-56B x 2Pcs				
ST305P	305	ELGC-300-H-A or XLG-320-H-A or SS-150EP-56B x 2Pcs				

M series						
ST024M	24	XLG-50-A or SS-50EP-50B	96	515x190x99; 2,4	0,10	
ST040M	40	XLG-50-A or SS-50EP-50B				
ST050M	50	XLG-50-A or SS-50EP-50B				
ST060M	60	XLG-75-H-A or SS-75EP-56B				
ST080M	80	XLG-100-H-A or SS-100EP-56B	144	575x242x109; 3,6	0,14	
ST100M	100	XLG-100-H-A or SS-100EP-56B				
ST105M	105	XLG-100-H-A or SS-100EP-56B				
ST120M	120	XLG-150-H-A or SS-150EP-56B	192	615x262x109; 4,1	0,16	
ST150M	150	XLG-150-H-A or SS-150EP-56B				
ST180M	180	XLG-200-H-A or SS-200EP-56B	240	685x287x109; 5,3	0,20	
ST200M	200	XLG-200-H-A or SS-200EP-56B				

Mode list for LED drivers:

Model No.	Rated input	Rated output	ta; tc	Remark	Certificate
XLG-50-A	100-240Vac; 50/60Hz; 0,62A	22-54Vdc; Max.2,1A; Max.50W; Uout:57Vdc	ta:50°C (100-200Vac); 60°C (200-240Vac); tc:90°C	Independent; Class I; CC; SELV; IP67	DEKRA 35-109039
XLG-75-H-A	100-240Vac; 50/60Hz; 1,0A	27-56Vdc; Max.2,1A; Max.75,6W; Uout:60Vdc	ta:50°C (100-200Vac); 60°C (200-240Vac); tc:90°C	Independent; Class I; CC; SELV; IP67	TÜV Rheinland HN 69262055
XLG-100-H-A	100-240Vac; 50/60Hz; 1,1A	27-56Vdc; Max.2,8A; Max.100W; Uout:60Vdc	ta:50°C (100-200Vac); 60°C (200-240Vac); tc:90°C	Independent; Class I; CC; SELV; IP67	DEKRA 35-125187
XLG-150-H-A	100-240Vac; 50/60Hz; 2,0A	27-56Vdc; 2,68-4,17A; Max.150W; Uout:60Vdc	ta:40°C (100-200Vac); 55°C (200-240Vac); tc:90°C	Independent; Class I; CC; SELV; IP67	DEKRA 35-123008
XLG-200-H-A	100-240Vac; 50/60Hz;	27-56Vdc; 3,5-5,55A; Max.200W;	ta:40°C (100-200Vac);	Independent; Class I; CC;	DEKRA 35-123476

	2,4A	Uout:60Vdc	50°C (200-240Vac); tc:90°C	SELV; IP67	
XLG-240-H-A	100-240Vac; 50/60Hz; 2,7A	27-56Vdc; 4,28-6,66A; Max.239,6W; Uout:60Vdc	ta:40°C (100-200Vac); 50°C (200-240Vac); tc:90°C	Independent; Class I; CC; SELV; IP67	DEKRA 35-124622
XLG-320-H-A	120-277Vac; 50/60Hz; 3,6A	30-56Vdc; 5,57-7,42A; Max.312W; Uout:60Vdc	ta:35°C (120-200Vac); 45°C (200-277Vac); tc:85°C	Independent; Class I; CC; SELV; IP67	DEKRA 35-123407
ELGC-300-H-A	100-240Vac; 50/60Hz; 3,0A	29-58Vdc; Max.6,8A (100-200Vac); Max.8,0A (200-240Vac); Max.256,36W (100-200Vac); Max.301,6W (200-240Vac); Uout:62Vdc	ta:40°C; tc:85°C	Independent; Class I; CC; SELV; IP67	DEKRA 35-126761
Remark: --					
SS-50EP-50B	120-277Vac; 50/60Hz; Max.0,55A	28-50Vdc; 0,8-1,32A; Max.50W; Uout:60Vdc	tc:80°C	Built-in; CC; SELV	TÜV SÜD B 083805 0100
SS-75EP-56B	120-277Vac; 50/60Hz; Max.0,8A	28-56Vdc; 1,0-2,1A; Max.75W; Uout:60Vdc	tc:90°C	Built-in; CC; SELV	TÜV SÜD U6 083805 0114
SS-100EP-56B	120-277Vac; 50/60Hz; Max.1,2A	28-56Vdc; 1,3-2,66A; Max.96W; Uout:60Vdc	tc:90°C	Built-in; CC; SELV	TÜV SÜD U6 083805 0114
SS-150EP-56B	120-277Vac; 50/60Hz; Max.1,6A	28-56Vdc; 2,0-4,2A; Max.150W; Uout:60Vdc	tc:90°C	Built-in; CC; SELV	TÜV SÜD U6 083805 0114
SS-200EP-56B	120-277Vac; 50/60Hz; Max.2,4A	28-56Vdc; 2,8-5,6A; Max.200W; Uout:60Vdc	tc:90°C	Built-in; CC; SELV	TÜV SÜD U6 083805 0114
SS-240EP-56B	120-277Vac; 50/60Hz; Max.2,8A	28-56Vdc; 3,3-6,66A; Max.240W; Uout:60Vdc	tc:90°C	Built-in; CC; SELV	TÜV SÜD U6 083805 0114
Remark: Reinforced insulation was provided between input circuit and output/ dimming circuit. Basic insulation was provided between output circuit and dimming circuit. The dimming function of LED driver not used.					

Unless otherwise specified, models ST305P and ST200M were chosen as representative models to perform all tests.

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.2 (0)	**GENERAL TEST REQUIREMENTS**		—
3.2 (0.3)	More sections applicable .....:	Yes ☐ No ☒	—
3.2 (0.5)	Components	(see Annex 1)	—
3.2 (0.7)	**Information for luminaire design in light sources standards**		—
3.2 (0.7.2)	Light source safety standard .....:	IEC 62031; EN IEC 62031	—
	Luminaire design in the light source safety standard		P
3.4 (2)	**CLASSIFICATION OF LUMINAIRES**		—
3.4 (2.2)	Type of protection .....:	Class I	P
3.4 (2.3)	Degree of protection.....:	IP66	P
3.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces .....:	Yes ☒ No ☐	—
3.4 (2.5)	Luminaire for normal use .....:	Yes ☒ No ☐	—
	Luminaire for rough service .....:	Yes ☐ No ☒	—
3.4 (-)	Modes of installation of road or street lighting		—
	a) on a pipe	Yes ☒ No ☐	—
	b) on a mast arm	Yes ☒ No ☐	—
	c) on a post top	Yes ☐ No ☒	—
	d) on span or suspension wires	Yes ☐ No ☒	—
	e) on a wall	Yes ☐ No ☒	—
3.5 (3)	**MARKING**		—
3.5 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
3.5 (3.3)	Additional information		P
	Language of instructions	English	P
3.5 (3.3.1)	Combination luminaires		N/A
3.5 (3.3.2)	Nominal frequency in Hz	50/60Hz	P
3.5 (3.3.3)	Operating temperature		N/A
3.5 (3.3.5)	Wiring diagram		N/A
3.5 (3.3.6)	Special conditions		N/A
3.5 (3.3.7)	Metal halide lamp luminaire – warning		N/A
3.5 (3.3.8)	Limitation for semi-luminaires		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
3.5 (3.3.9)	Power factor and supply current		N/A
3.5 (3.3.10)	Suitability for use indoors		N/A
3.5 (3.3.11)	Luminaires with remote control		N/A
3.5 (3.3.12)	Clip-mounted luminaire – warning		N/A
3.5 (3.3.13)	Specifications of protective shields		N/A
3.5 (3.3.14)	Symbol for nature of supply		P
3.5 (3.3.15)	Rated current of socket outlet		N/A
3.5 (3.3.16)	Rough service luminaire		N/A
3.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments	Type Y	P
3.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A
3.5 (3.3.19)	Protective conductor current in instruction if applicable		N/A
3.5 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
3.5 (3.3.21)	Non replaceable and non-user replaceable light sources information provided	Non-user replaceable light sources	P
3.5 (3.3.22)	Controllable luminaires, classification of insulation provided	For dimming circuit of SS series LED drivers	P
3.5 (3.3.23)	Luminaires without control gear provided with necessary information for selection of appropriate component		N/A
3.5 (3.3.24)	If not supplied with terminal block, information on the packaging		P
3.5 (3.3.25)	Luminaires employing light sources emitting UV on mains wiring, information provided		N/A
3.5 (3.3.26)	Wall mounted luminaire using external flexible cable or cord longer than 0.3 m, information provided		N/A
3.5 (3.4)	Test with water	15s	P
	Test with hexane	15s	P
	Legible after test		P
	Label attached		P
3.5 (-)	Additional information in instruction leaflet		P
	a) Design attitude		P
	b) Weight		P
	c) Overall dimensions		P
	d) Maximum projected area if applicable		P
	e) Cross-sectional area of wires if applicable		N/A
	f) Suitability for indoors use		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	g) Dimensions of the compartment		N/A
	h) Torque setting to be applied to bolts or screws		P
	i) Maximum mounting height		P
3.6 (4)	**CONSTRUCTION**		—
3.6 (4.2)	Components replaceable without difficulty		P
3.6 (4.3)	Wireways smooth and free from sharp edges		P
3.6 (4.4)	**Lampholders**		**N/A**
3.6 (4.4.1)	Integral lampholder		N/A
3.6 (4.4.2)	Wiring connection		N/A
3.6 (4.4.3)	Lampholder for end-to-end mounting		N/A
3.6 (4.4.4)	Positioning		N/A
	- pressure test (N) .....:		—
	After test the lampholder comply with relevant standard sheets and show no damage		N/A
	After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation		N/A
	- bending test (N) .....:		—
	After test the lampholder have not moved from its position and show no permanent deformation		N/A
3.6 (4.4.5)	Peak pulse voltage		N/A
3.6 (4.4.6)	Centre contact		N/A
3.6 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A
3.6 (4.4.8)	Lamp connectors		N/A
3.6 (4.4.9)	Caps and bases correctly used		N/A
3.6 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N/A
3.6 (4.5)	**Starter holders**		**N/A**
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
3.6 (4.6)	**Terminal blocks**		**N/A**
	Tails		N/A
	Unsecured blocks		N/A
3.6 (4.7)	**Terminals and supply connections**		**P**
3.6 (4.7.1)	Contact to metal parts		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.6 (4.7.2)	Test 8 mm live conductor		P
	Test 8 mm earth conductor		P
3.6 (4.7.3)	Terminals for supply conductors		P
3.6 (4.7.3.1)	Welded method and material		N/A
	- stranded or solid conductor		N/A
	- spot welding		N/A
	- welding between wires		N/A
	- Type Z attachment		N/A
	- mechanical test according to 15.6.2		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
3.6 (4.7.4)	Terminals other than supply connection		P
3.6 (4.7.5)	Heat-resistant wiring/sleeves		N/A
3.6 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A
3.6 (4.8)	**Switches**		**N/A**
	- adequate rating		N/A
	- adequate fixing		N/A
	- polarized supply		N/A
	- compliance with IEC 61058-1 for electronic switches		N/A
3.6 (4.9)	**Insulating lining and sleeves**		**N/A**
3.6 (4.9.1)	Retainment		N/A
	Method of fixing .....:		N/A
3.6 (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
3.6 (4.10)	**Double or reinforced insulation**		**N/A**
3.6 (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
3.6 (4.10.2)	Assembly gaps:		N/A
	- not coincidental		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- no straight access with test probe		N/A
3.6 (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
3.6 (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 appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor		N/A
	Capacitors comply with IEC 60384-14		N/A
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A
3.6 (4.11)	**Electrical connections and current-carrying parts**		**P**
3.6 (4.11.1)	Contact pressure		P
3.6 (4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
3.6 (4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
3.6 (4.11.4)	Material of current-carrying parts		P
3.6 (4.11.5)	No contact to wood or mounting surface		P
3.6 (4.11.6)	Electro-mechanical contact systems		N/A
3.6 (4.12)	**Screws and connections (mechanical) and glands**		**P**
3.6 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N/A
	Torque test: torque (Nm); part.....:	Screws for fixing settable metal bracket: 8,0Nm	P
	Torque test: torque (Nm); part.....:	Screw for fixing LED driver: 1,2Nm	P
	Torque test: torque (Nm); part.....:	Screw for fixing earthing: 0,5Nm	P
	Torque test: torque (Nm); part.....:	Screw for fixing glass cover: 1,2Nm	P
	Torque test: torque (Nm); part.....:	Screw for fixing LED module PCB/ LED lens: 0,5Nm	P

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Clause	Requirement + Test	Result - Remark	Verdict
3.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
3.6 (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
3.6 (4.12.5)	Screwed glands; force (Nm) ..... :	Plastic gland for P series models: 2,5Nm; Metal gland for M series models: 4,0Nm	P
3.6 (4.13)	**Mechanical strength**		**P**
3.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm) ..... :	Glass cover: 0,5Nm	P
	- other parts; energy (Nm) ..... :	Metal enclosure: 0,7Nm	P
	1) live parts		P
	2) linings		N/A
	3) protection		P
	4) covers		P
3.6 (4.13.2)	Metal parts have adequate mechanical strength		P
3.6 (4.13.3)	Straight test finger		P
3.6 (4.13.4)	Rough service luminaires		N/A
	- IP54 or higher		N/A
	a) fixed		N/A
	b) hand-held		N/A
	c) delivered with a stand		N/A
	d) for temporary installations and suitable for mounting on a stand		N/A
3.6 (4.13.6)	Tumbling barrel		N/A
3.6 (4.14)	**Suspensions, fixings and means of adjusting**		**P**
3.6 (4.14.1)	Mechanical load:		P
	A) four times the weight		P
	B) torque 2,5 Nm		P
	C) bracket arm; bending moment (Nm) ..... :		N/A
	D) load track-mounted luminaires		N/A
	E) clip-mounted luminaires, glass-shelve. Thickness (mm) ..... :		N/A
	Metal rod. Diameter (mm) ..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Fixed luminaire or independent control gear without fixing devices		N/A
3.6 (4.14.2)	Load to flexible cables		N/A
	Mass (kg) .....:		—
	Stress in conductors (N/mm²) .....:		N/A
	Mass (kg) of semi-luminaire .....:		N/A
	Bending moment (Nm) of semi-luminaire .....:		N/A
3.6 (4.14.3)	Adjusting devices:		P
	- flexing test; number of cycles.....:	45 cycles	P
	- strands broken .....:	No strands broken	P
	- electric strength test afterwards		P
3.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
3.6 (4.14.5)	Guide pulleys		N/A
3.6 (4.14.6)	Strain on socket-outlets		N/A
3.6 (4.15)	**Flammable materials**		**P**
	- glow-wire test 650°C.....:	See Test Table 3.15 (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
3.6 (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
3.6 (4.16)	**Luminaires for mounting on normally flammable surfaces**		**N/A**
	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
3.6 (4.16.1)	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
3.6 (4.16.2)	Thermal protection:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- in lamp control gear		N/A
	- external		N/A
	- fixed position		N/A
	- temperature marked lamp control gear		N/A
3.6 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N/A
3.6 (4.17)	**Drain holes**		**N/A**
	Clearance at least 5 mm		N/A
3.6 (4.18)	**Resistance to corrosion**		**P**
3.6 (4.18.1)	- rust-resistance		N/A
3.6 (4.18.2)	- season cracking in copper		N/A
3.6 (4.18.3)	- corrosion of aluminium		P
3.6 (4.19)	Ignitors compatible with ballast		N/A
3.6 (4.20)	Rough service vibration		N/A
3.6 (4.21)	**Protective shield**		**N/A**
3.6 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A
	Shield of glass if tungsten halogen lamps		N/A
3.6 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
3.6 (4.21.3)	No direct path		N/A
3.6 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment.....:	See Test Table 3.15 (13.3.2)	N/A
3.6 (4.22)	Attachments to lamps not cause overheating or damage		N/A
3.6 (4.23)	Semi-luminaires comply Class II		N/A
3.6 (4.24)	**Photobiological hazards**		**P**
3.6 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N/A
3.6 (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

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Clause	Requirement + Test	Result - Remark	Verdict
	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
3.6 (4.25)	**Mechanical hazard**		**P**
	No sharp point or edges		P
3.6 (4.26)	**Short-circuit protection**		**N/A**
3.6 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N/A
3.6 (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
3.6 (4.27)	**Terminal blocks with integrated screwless earthing contacts**		**N/A**
	Test according Annex V		N/A
	Pull test of terminal fixing (20 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Pull test of mechanical connection (50 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Voltage drop test, resistance < 0,05 Ω		N/A
3.6 (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
3.6 (4.29)	**Luminaires with non-replaceable light source**		**N/A**
	Not possible to replace light source		N/A
	Live part not accessible after parts have been opened by hand or tools		N/A
3.6 (4.30)	**Luminaires with non-user replaceable light source**		**N/A**
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	At least one fixing means requiring use of tool		N/A
3.6 (4.31)	**Insulation between circuits**		**P**
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3		P
	Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfil requirements according 4.31.1 – 4.31.3	For dimming circuit of SS series LED drivers	P
3.6 (4.31.1)	SELV or PELV circuits		P
	Used SELV/PELV source		P
	Voltage ≤ ELV		P
	Insulating of SELV/PELV circuits from LV supply		P
	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		P
	SELV/PELV circuits insulated from accessible parts according Table X.1		P
	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
3.6 (4.31.2)	FELV circuits		N/A
	Used FELV source		N/A
	Voltage ≤ ELV		N/A
	Insulating of FELV circuits from LV supply		N/A
	FELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to 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
3.6 (4.31.3)	Other circuits		N/A
	Other circuits insulated from accessible parts according Table X.1		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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
3.6 (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
3.6 (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
3.6 (4.34)	**Electromagnetic fields (EMF)**		P
	No harmful electromagnetic fields		P
3.6 (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
3.6 (4.36)	**Track-mounted luminaires**		N/A
	Test in accordance with Annex A of IEC60570:2003/AMD2:2019		N/A
3.6.1 (-)	At least IP X3 or X5 respectively. IP ……...:	IP66	P
	Column-integrated luminaires:		N/A
	- parts below 2,5 m. IP ..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- parts above 2,5 m. IP ..... :		N/A
3.6.2 (-)	Suspension on span wires		N/A
3.6.3 (-)	Means for attaching the luminaire or external parts to its support appropriate to the weight		P
3.6.3.1 (-)	Static load test		P
	- drag coefficient..... :	1,2	P
	- loaded area (m²)..... :	0,24 [Test model: ST305P]; 0,20 [Test model: ST200M]	P
	- used load (N)..... :	477,0 [Test model: ST305P]; 397,5 [Test model: ST200M]	P
	- measured deformation (cm/m) ..... :	0 (limit 2cm/m)	P
	- no rotation		P
3.6.4 (-)	Adjustable lampholders		N/A
3.6.5 (-)	Luminaires installed above 5 m, glass covers shall be:		P
	a) glass that fractures into small pieces (test according to 3.6.5.1), or		P
	b) glass having a high impact shock resistance (test according to 3.6.5.2), or		N/A
	c) protected by any means to retain glass fragments		N/A
	For tunnel luminaires 3.6.5.1 apply		N/A
	Method of protection declared by the manufacturer	Constituted with a glass that fractures into small pieces	P
3.6.5.1 (-)	Protection by the use of glass that fractures into small pieces		P
	- number of particles is more than 40..... :	61 Pcs	P
3.6.5.2 (-)	Protection by the use of high impact resistant glass		N/A
3.6.5.2.1 (-)	Glass covers have high mechanical strength		N/A
	Test according IEC 62262 with test apparatus according IEC 60068-2-75 with impact energy of 5J on preconditioned sample		N/A
3.6.5.2.2 (-)	Glass covers not break into large pieces		N/A
	- test according 3.6.5.1, number of particles is more than 20..... :		N/A
3.6.6 (-)	Connection compartment of column-integrated luminaire		N/A
	- provides adequate space		N/A
	- means for attachment		N/A
	- means for attachment of metal corrosion-resistant		N/A
3.6.7 (-)	Compliance with ISO standard or other..... :		N/A
3.6.8 (-)	Doors of column-integrated luminaires:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- corrosion-resistant		N/A
	- opening only possible for an authorized person		N/A
	- impact test 5 Nm		N/A
	- sample show no damage		N/A
3.6.9 (-)	Column-integrated luminaire:		N/A
	- dimension of the cable entry slot (mm)..... :		N/A
	- cable path from the slot to the connection compartment (mm) ..... :		N/A
	- cable path free from obstruction that might cause abrasion of the cable		N/A
3.7 (11)	**CREEPAGE DISTANCES AND CLEARANCES**		—
3.7 (11.2)	Creepage distances and clearances .....:	See Table 3.7 (11.2)	P
	Impulse withstand category (Normal category II) (Category III Annex U, Table U.1)	Category II ☒ Category III ☐	—
	Protected against pollution, reduced creepage and clearance according Annex P of IEC 61347-1		N/A
3.7 (11.2.2)	Creepage distances for frequency up to 30 kHz	See Test Table 3.7 (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 3.7 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 3.7 (11.2) II	N/A
3.7 (11.2.3)	Clearances for frequency up to 30 kHz	See Test Table 3.7 (11.2) I	P
	Clearances distances for frequency over 30 kHz:		N/A
	- Controlgear marked with U_P	See Test Table 3.7 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 3.7 (11.2) II	N/A
3.8 (7)	**PROVISION FOR EARTHING**		—
3.8 (7.2.1 + 7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		P
	Resistance < 0,5 Ω.....:	0,027Ω	P
	Self-tapping screws used		N/A
	Thread-forming screws		N/A
	Thread-forming screw used in a grove		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Protective earth makes contact first		N/A
	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
3.8 (7.2.2 + 7.2.3)	Protective earth continuity in joints, etc.		P
3.8 (7.2.4)	Locking of clamping means		P
	Compliance with 4.7.3		P
3.8 (7.2.5)	Protective earth terminal integral part of connector socket		N/A
3.8 (7.2.6)	Protective earth terminal adjacent to mains terminals		P
3.8 (7.2.7)	Electrolytic corrosion of the protective earth terminal		P
3.8 (7.2.8)	Material of protective earth terminal		P
	Contact surface bare metal		P
3.8 (7.2.10)	Class II luminaire for looping-in		N/A
	Double or reinforced insulation to functional earth		N/A
3.8 (7.2.11)	Protective earthing core coloured green-yellow		P
	Length of earth conductor		P
3.8 (7.2.12)	PELV circuit connected to protective earth for functional purpose		N/A
3.9 (14)	**SCREW TERMINALS**		—
	Separately approved; component list	(see Annex 1)	N/A
	Part of the luminaire	(see Annex 3)	N/A
3.9 (15)	**SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS**		—
	Separately approved; component list.....:	(see Annex 1)	P
	Part of the luminaire .....:	(see Annex 4)	N/A
3.10 (5)	**EXTERNAL AND INTERNAL WIRING**		—
3.10 (5.2)	**Supply connection and external wiring**		**P**
3.10 (5.2.1)	Means of connection.....:	Supply cord without plug	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

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Clause	Requirement + Test	Result - Remark	Verdict
3.10 (5.2.2)	Type of cable.....:	See Annex 1	P
	Nominal cross-sectional area (mm²).....:	See Annex 1	P
	Cables equal to IEC 60227 or IEC 60245		P
3.10 (5.2.3)	Type of attachment, X, Y or Z	Type Y	P
3.10 (5.2.5)	Type Z not connected to screws		N/A
3.10 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
3.10 (5.2.7)	Cable entries through rigid material have rounded edges		P
3.10 (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
3.10 (5.2.9)	Locking of screwed bushings		N/A
3.10 (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
3.10 (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
3.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment	Type Y	P

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Clause	Requirement + Test	Result - Remark	Verdict
3.10 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N) .....:	See clause 3.10.1(-)	P
	- torque test: torque (Nm).....:	See clause 3.10.1(-)	P
	- displacement ≤ 2 mm		P
	- no movement of conductors		P
	- no damage of cable or cord		P
	- function independent of electrical connection		P
3.10 (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 ≤ 25V RMS/60V DC		N/A
	- Ordinary Class III luminaire supplied with PELV ≤12V RMS/30V DC		N/A
	- Other than ordinary Class III luminaire supplied with voltage ≤12V RMS/30V DC		N/A
	Pull test of 30N		N/A
3.10 (5.2.11)	External wiring passing into luminaire		P
3.10 (5.2.12)	Looping-in terminals		N/A
3.10 (5.2.13)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N/A
3.10 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A
3.10 (5.2.15)	Connectors for Class III luminaires (IEC 60603 or IEC 62680)		N/A
3.10 (5.2.16)	Appliance inlets (IEC 60320)		N/A
	Installation couplers (IEC 61535)		N/A
	Appliance inlet or connector systems (IEC 61984)		N/A
3.10 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
3.10 (5.2.18)	Used plug in accordance with		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- IEC 60083		N/A
	- other standard		N/A
3.10 (5.3)	**Internal wiring**		**P**
3.10 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		N/A
	- not delivered/ mounting instruction		N/A
	- factory assembled		N/A
	- socket outlet loaded (A).....:		N/A
	- temperatures.....:	(see Annex 2)	N/A
	Green-yellow for protective earth only		P
3.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P
	Cross-sectional area (mm²) .....:	See Annex 1	P
	Insulation thickness	Approved cable and wire	P
	Extra insulation added where necessary		N/A
3.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		P
	Cross-sectional area (mm²) .....:	See Annex 1	P
3.10 (5.3.1.3)	Double or reinforced insulation for class II		N/A
3.10 (5.3.1.4)	Conductors without insulation		N/A
3.10 (5.3.1.5)	SELV/PELV current-carrying parts		P
3.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
3.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N/A
	Joints, raising/lowering devices		N/A
	Telescopic tubes etc.		N/A
	No twisting over 360°		P
3.10 (5.3.3)	Insulating bushings:		N/A
	- suitable fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- cables with protective sheath		N/A
3.10 (5.3.4)	Joints and junctions effectively insulated		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
3.10 (5.3.5)	Strain on internal wiring		N/A
3.10 (5.3.6)	Wire carriers		N/A
3.10 (5.3.7)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		P
3.10 (5.4)	**Test to determine suitability of conductors having a reduced cross-sectional area**		**N/A**
	Under test the temperature of the luminaire wiring insulation not exceed the limits stated in Table 12.2	(see Annex 2)	N/A
	No damage to luminaire wiring after test		N/A
3.10.1 (-)	Cord anchorage if applicable		P
	- pull test: 25 times; pull (N) ..... :	60	P
	- torque test: torque (Nm)..... :	0,25	P
3.11 (8)	**PROTECTION AGAINST ELECTRIC SHOCK**		—
3.11 (8.2.1)	Live parts not accessible		P
	Basic insulated parts not used on the outer surface without appropriate protection		P
	Basic insulated parts not accessible with standard test finger on portable, settable and adjustable luminaires		P
	Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires		N/A
	Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements		N/A
	Basic insulation only accessible under lamp or starter replacement		N/A
	Protection in any position		P
	Double-ended tungsten filament lamp		N/A
	Insulation lacquer not reliable		N/A
	Double-ended high pressure discharge lamp		N/A
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
3.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
3.11 (8.2.3.a)	Class II luminaire:		N/A
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- basic insulation not accessible other than during starter or lamp replacement		N/A
	- glass protective shields not used as supplementary insulation		N/A
3.11 (8.2.3.b)	BC lamp holder of metal in class I luminaires shall be connected to protective earth		N/A
3.11 (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
3.11 (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
3.11 (8.2.4)	Portable luminaire have protection independent of supporting surface		N/A
3.11 (8.2.5)	Compliance with the standard test finger or relevant probe		P
3.11 (8.2.6)	Covers reliably secured		P
3.11 (8.2.7)	Luminaire other than below with capacitor $> 0,5\ \mu F$ not exceed 50 V 1 min after disconnection		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Portable luminaire with capacitor > 0,1 μF (0.25) not exceed 34 V 1 s after disconnection		N/A
	Other luminaires with capacitor > 0,1 μF (0.25) with plug and track adaptors not exceed 60 V 5 s after disconnection		N/A
3.12 (12)	**ENDURANCE TEST AND THERMAL TEST**		—
3.12 (-)	If IP > IP 20 relevant test of (12.4), (12.5), (12.6) and (12.7) after (9.2) before (9.3) as specified in 3.13		—
3.12 (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)	—
3.12 (12.3)	**Endurance test:**		P
	a) mounting-position .....:	As in normal use	—
	b) test temperature (°C).....:	50	—
	c) total duration (h) .....:	240	—
	d) supply voltage (V).....:	264	—
	d) if not equipped with control gear, constant voltage/current (V) or (A) .....:	--	—
3.12 (12.3.1d)	d) Class III luminaires powered via information technology communication cable:		N/A
	- voltage under normal operation (V)……...:		—
	- voltage under abnormal operation (V)……...:		—
	e) luminaire ceases to operate		—
	f) luminaire with constant light output function		N/A
3.12 (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
3.12 (12.4)	**Thermal test (normal operation)**	(see Annex 2)	P
3.12 (12.5)	**Thermal test (abnormal operation)**	(see Annex 2)	P
3.12 (12.6)	**Thermal test (failed lamp control gear condition):**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
3.12 (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
3.12 (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
3.12 (12.7)	**Thermal test (failed lamp control gear in plastic luminaires):**		N/A
3.12 (12.7.1)	Luminaire without temperature sensing control		N/A
3.12 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N/A
	Test method 12.7.1.1 or Annex W .....:		—
	Test according to 12.7.1.1:		N/A
	- case of abnormal conditions .....:		—
	- Ballast failure at supply voltage (V) .....:		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
	Test according to Annex W:		N/A
	- case of abnormal conditions .....:		—
	- measured winding temperature (°C): at 1,1 Un .....:		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un .....:		—
	- calculated temperature of fixing point/exposed part (°C) .....:		—
	Ball-pressure test..... :	See Table 3.15 (13.2.1)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
3.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N/A
	- case of abnormal conditions .....:		—
	- measured winding temperature (°C): at 1,1 Un .....:		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un .....:		—
	- calculated temperature of fixing point/exposed part (°C) .....:		—
	Ball-pressure test.....:	See Table 3.15 (13.2.1)	N/A
3.12 (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
3.12 (12.7.2)	Luminaire with temperature sensing control		N/A
	- thermal link.....:	Yes ☐ No ☐	—
	- manual reset cut-out.....:	Yes ☐ No ☐	—
	- auto reset cut-out .....:	Yes ☐ No ☐	—
	- case of abnormal conditions .....:		—
	- highest measured temperature of fixing point/ exposed part (°C): .....:		—
	Ball-pressure test:.....:	See Table 3.15 (13.2.1)	N/A
3.12.1 (-)	Temperature reduction if for outdoor use only		P
3.12.2 (-)	(See above)		—
3.12.3 (-)	Glass covers used within the thermal limits declared by the glass manufacturer		P

3.13 (9)	**RESISTANCE TO DUST AND MOISTURE**		—
3.13.1 (-)	If IP > IP 20 the order of tests as specified in clause 3.12		P
3.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP.....:	IP66	—
	- mounting position during test.....:	As in normal use	—
	- fixing screws tightened; torque (Nm).....:	--	—
	- tests according to clauses .....:	Clauses 9.2.2 and 9.2.7	—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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
	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		P
3.13 (9.3)	Humidity test 48 h		P
3.14 (10)	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		—
3.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø .....:	Metal foil	—
	Insulation resistance (MΩ).....:		—
	SELV/PELV:		P
	- between current-carrying parts of different polarity:		N/A
	- between current-carrying parts and mounting surface.....:	100 MΩ (required: 1MΩ)	P
	- between current-carrying parts and metal parts of the luminaire.....:	100 MΩ (required: 1MΩ)	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts.....:		N/A
	- Insulation bushings as described in Section 5 .....:		N/A
	Other than SELV/PELV:		P
	- between live parts of different polarity.....:		N/A
	- between live parts and mounting surface.....:	100MΩ (required: 2MΩ)	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- between live parts and metal parts.....:	For class I construction: 100 MΩ (required: 2MΩ); For class II construction: 100MΩ (required: 4MΩ)	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 .....:	100MΩ (required: 2MΩ)	P
	- Insulation bushings as described in Section 5 .....:		N/A
3.14 (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/PELV:		P
	- between current-carrying parts of different polarity:		N/A
	- between current-carrying parts and mounting surface .....:	500V	P
	- between current-carrying parts and metal parts of the luminaire.....:	500V	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....:		N/A
	- Insulation bushings as described in Section 5 .....:		N/A
	Other than SELV/PELV:		P
	- between live parts of different polarity.....:		N/A
	- between live parts and mounting surface .....:	1480V	P
	- between live parts and metal parts.....:	Class I construction: 1480V; Class II construction: 2960V	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 .....:	1480V	P
	- Insulation bushings as described in Section 5 .....:		N/A
3.14 (10.3)	Touch current (mA).....:	0,01mA (limit: 0,7mA)	P
	Protective conductor current (mA).....:	0,52mA (limit: 3,5mA)	P

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Clause	Requirement + Test	Result - Remark	Verdict

3.15 (13)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		—
3.15 (13.2.1)	Ball-pressure test.....:	See Test Table 3.15 (13.2.1)	N/A
3.15 (13.3.1)	Needle-flame test (10 s) .....:	See Test Table 3.15 (13.3.1)	N/A
3.15 (13.3.2)	Glow-wire test (650°C).....:	See Test Table 3.15 (13.3.2)	N/A
3.15 (13.4)	Proof tracking test (IEC 60112).....:	See Test Table 3.15 (13.4)	N/A

3.7 (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:	B	6,25	1,5	11.1.B	6,25	2,5	11.1.A	
Distance 2:	B	6,25	0,5	11.1.B	6,25	1,3	11.1.A	
Distance 3:	B	2,84	0,5	11.1.B	2,84	1,3	11.1.A	
Working voltage (V) .....:					See below			—
PTI .....:					< 600 ☒ ≥ 600 ☐			—
Pulse voltage or U_P if applicable (kV) .....:					--			—
Supplementary information: Min. values were recorded. Distance 1: Between live parts of WAGO terminal and accessible parts (input of LED driver circuit) (Working voltage: Max.240VAC); Distance 2: Between current carrying part of WAGO terminal and accessible parts (Output of LED driver circuit) (Working voltage: Max.62VDC); Distance 3: Between current carrying part of LED module and accessible parts (Output of LED driver circuit) (Working voltage: Max.62VDC).								

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

3.7 (11.2)	**TABLE II: Creepage distances and clearances**							**N/A**
Minimum distances (mm) for a.c. higher than 30 kHz sinusoidal voltages								
Applicable part of IEC 61347-1 Table 7 and 8* or IEC 60664-4 Table 1 and 2								
Distances	**Insulation type ****	**Measured clearance**	**Required**		**Measured creepage**	**Required**		
			clearance	***Table**		**creepage**	***Table**	
Distance 1:	--	--	--	--	--	--	--	
Working voltage (V) .....:					--			—
Frequency if applicable (kHz).....:					--			—
PTI.....:					< 600 ☐ ≥ 600 ☐			—

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Clause	Requirement + Test	Result - Remark	Verdict

Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :	--	—
Supplementary information: --		

** Insulation type: B – Basic; S – Supplementary; R – Reinforced.

3.15 (13.2.1)	**TABLE: Ball Pressure Test of Thermoplastics**			**N/A**
Allowed impression diameter (mm) .....:		≤ 2,0 mm		—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
--	--	---	--	
Supplementary information: --				

3.15 (13.3.1)	**TABLE: Needle-flame test**				**N/A**
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
--	--	--	--	--	--
Supplementary information: --					

3.15 (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**		
LED lens	Darkoo Optics (Zhongshan) Co., Ltd	0	0	--	--	--	P
Ignition of the specified layer placed underneath the test specimen (Yes/No) ..... :							No
Supplementary information: --							

3.15 (13.4)	**TABLE: Proof tracking test**				**N/A**
Test voltage PTI .....:		175 V			—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
--	--	--	--	--	--
Supplementary information: --					

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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 1	TABLE: Critical components information					P
Object / part No.	**Code**	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
Supply cord	B	Zhejiang Jinniu Cable Co., Ltd	H05RN-F	3x1,0mm^2	DIN EN 50525-2-21	VDE 40028195*
Alt.	B	Guangdong Rifeng Electrical Cable Co., Ltd.	H05RN-F	3x1,0mm^2	DIN EN 50525-2-21	VDE 40015999*
Alt.	B	Shanghai Chuangqi Cable Co., Ltd.	H05RN-F	3x1,0mm^2	DIN EN 50525-2-21	VDE 40025408*
Alt.	B	Standard Electric Wire & Cable Co., Ltd.	H05RN-F	3x1,0mm^2	DIN EN 50525-2-21	VDE 40016905*
Alt.	B	Zhenjiang Zhongjia Electric Co., Ltd.	H05RN-F	3x1,0mm^2	DIN EN 50525-2-21	VDE 40030173*
Alt.	B	Shanghai Yusheng Enterprise Development Co., Ltd.	H05RN-F	3x1,0mm^2	DIN EN 50525-2-21	VDE 40017662*
Alt.	B	Dong Guan Recheer Electric Wire & Cable Co., Ltd.	H05RN-F	3x1,0mm^2	DIN EN 50525-2-21	VDE 40015173*
WAGO terminal	B	WAGO KONTAKTTECHNIK GMBH & CO KG	222-412; 222-413; 222-414; 222-415	450VAC; T85; 0,2…4,0mm^2	IEC/EN 60998-1 IEC/EN 60998-2-2	ENEC-01360-M1*
Earthing wire	B	Dongguan Nistar Transmitting Technology Co. Inc.	H05SJ-K	0,75mm^2	DIN EN 50525-2-41	VDE 40017570*
Alt.	B	Shenzhen City Youchuangda Special Wire & Cable Co Ltd	1015	18AWG	UL 758 IEC/EN IEC 60598-1 IEC/EN 60598-2-3	UL E494503* + Tested with appliance#
Alt.	B	DONGGUAN TRIUMPHCABLE CO LTD	1015	18AWG	UL 758 IEC/EN IEC 60598-1 IEC/EN 60598-2-3	UL E249743* + Tested with appliance#
Alt.	B	DONG GUAN SHENG PAI ELECTRIC WIRE & CABLE CO LTD	1015	18AWG	UL 758 IEC/EN IEC 60598-1 IEC/EN 60598-2-3	UL E347603* + Tested with appliance#

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Clause	Requirement + Test	Result - Remark	Verdict

LED driver	B	MEAN WELL	XLG-50-A; XLG-75-H-A; XLG-100-H-A; XLG-150-H-A; XLG-200-H-A; XLG-240-H-A; XLG-320-H-A; ELGC-300-H-A	Supply cord: H05RN-F; 3x1,0mm^2; Output cord: H05RN-F; 2x1,0mm^2; Other ratings see “General product information” for details	IEC/EN 61347-2-13 IEC/EN 61347-1	See “General product information” for details
LED driver	B	SOSEN	SS-50EP-50B; SS-75EP-56B; SS-100EP-56B; SS-150EP-56B; SS-200EP-56B; SS-240EP-56B	Supply cord: 1015; 105°C; 3x18AWG; Output/ Dimming cord: 1015; 105°C; 2x18AWG; Other ratings see “General product information” for details	IEC/EN 61347-2-13 IEC/EN 61347-1	See “General product information” for details
Internal wire of LED module	B	Zhejiang Jinniu Cable Co., Ltd	H05RN-F	2x0,75mm^2	DIN EN 50525-2-21	VDE 40028195*
Alt.	B	Guangdong Rifeng Electrical Cable Co., Ltd.	H05RN-F	2x0,75mm^2	DIN EN 50525-2-21	VDE 40015999*
Alt.	B	Shanghai Chuangqi Cable Co., Ltd.	H05RN-F	2x0,75mm^2	DIN EN 50525-2-21	VDE 40025408*
Alt.	B	Standard Electric Wire & Cable Co., Ltd.	H05RN-F	2x0,75mm^2	DIN EN 50525-2-21	VDE 40016905*
Alt.	B	Zhenjiang Zhongjia Electric Co., Ltd.	H05RN-F	2x0,75mm^2	DIN EN 50525-2-21	VDE 40030173*
Alt.	B	Shanghai Yusheng Enterprise Development Co., Ltd.	H05RN-F	2x0,75mm^2	DIN EN 50525-2-21	VDE 40017662*
Alt.	B	Dong Guan Recheer Electric Wire & Cable Co., Ltd.	H05RN-F	2x0,75mm^2	DIN EN 50525-2-21	VDE 40015173*
Alt.	B	Shenzhen City Youchuangda Special Wire & Cable Co Ltd	1015	18AWG; 105°C	UL 758 IEC/EN IEC 60598-1 IEC/EN 60598-2-3	UL E494503* + Tested with appliance#
Alt.	B	DONG GUAN SHENG PAI ELECTRIC WIRE	1332	20AWG; 200°C	UL 758 IEC/EN IEC	UL E347603* +

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Clause	Requirement + Test	Result - Remark	Verdict

		& CABLE CO LTD	3135; 3239	18AWG; 200°C	60598-1 IEC/EN 60598-2-3	Tested with appliance#
Alt.	B	DONGGUAN TRIUMPHCABLE CO LTD	1015	18AWG; 105°C	UL 758 IEC/EN IEC 60598-1 IEC/EN 60598-2-3	UL E249743* + Tested with appliance#
			3135; 3239	18AWG; 200°C		
LED module PCB	B	Shenzhen Junxin Aluminum Substrate Co Ltd	JX-L	130°C; V-0	UL 94 IEC/EN IEC 60598-1 IEC/EN 60598-2-3	UL E502851* + Tested with appliance#
LED for P series models	B	CREE	Cree® J Series™ 3030 LEDs	VF: 6,0-6,4V; IF:150mA; CCT: 2700K-6500K	IEC TR 62778	Tested with appliance#
Alt.	B	CREE	Cree® XLamp® XP-G3 LEDs	VF: 3,06V; IF:2000mA; CCT: 2700K-6500K	IEC TR 62778	Tested with appliance#
LED for M series models	B	LUMILEDS	2835R Series	VF: 8,4-9,0V; IF:120mA; CCT: 2700K-6500K	IEC TR 62778	Tested with appliance#
LED lens	B	Darkoo Optics (Zhongshan) Co., Ltd	DK-5050	V-0	IEC/EN IEC 60598-1 IEC/EN 60598-2-3	Tested with appliance#
Glass cover	B	Dongguan Hysone Renewable Energy Co., Ltd.	--	-35ºC to 200ºC; ΔT:150°C	IEC/EN IEC 60598-1 IEC/EN 60598-2-3	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

* License available upon request.

Please refer in TRF for the test standard publication year.

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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	TABLE: Thermal tests of Section 12		P
	Type reference ..... :	ST305P	—
	Lamp used ..... :	LED	—
	Lamp control gear used ..... :	SS-150EP-56B x 2Pcs	—
	Mounting position of luminaire ..... :	As in normal use	—
	Supply wattage (W) ..... :	311,6W [240V]	—
	Supply current (A) ..... :	1,324A [240V; PF: 0,983]	—
	Temperatures in test 1 – 4 below are corrected for ta (°C) ..... :	40°C	—
	- abnormal operating mode ..... :	LED driver output shorted circuit, output shutdown immediately, the temperature rise of components are lower than temperature rise of components at normal heating test	—
3.12 (12.4)	- test 1: rated voltage ..... :	240V	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current ..... :	1,06 x 240V = 254,4V	—
	- 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 ..... :	--	—
3.12 (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 ..... :	264V	—

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	40,0	--	33,8	--	90	--	--
WAGO terminal	40,0	--	65,8	--	85	--	--
Input cord of LED driver	40,0	--	59,8	--	105	--	--
tc of LED driver 1	40,0	80,7	--	--	90	--	--
tc of LED driver 2	40,0	79,2	--	--	90	--	--
Output wire of LED driver	40,0	--	72,3	--	105	--	--
Input wire of LED module	40,0	--	75,7	--	90	--	--
LED module PCB	40,0	--	97,8	--	130	--	--
LED lens	40,0	--	90,4	--	Ref.	--	--

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

Glass cover	40,0	--	32,4	--	200	--	--
Metal enclosure	40,0	--	64,1	--	Ref.	--	--
Mounting surface	40,0		53,8		90	--	--
Objected lighting (0,1m)	40,0	--	56,8	--	90	--	--

Supplementary information: 1. The products suitable for outdoor use only, 10°C was deducted from each measured temperature. 2. Max. temperatures were recorded.

	Type reference .....:	A: ST240P; B: ST105P; C: ST060P; D: ST050P	—
	Lamp used .....:	LED	—
	Lamp control gear used .....:	A: SS-240EP-56B; B: SS-100EP-56B; C: SS-75EP-56B; D: SS-50EP-50B	—
	Mounting position of luminaire .....:	As in normal use	—
	Supply wattage (W) .....:	A: 242,8W [240V]; B: 104,3W [240V]; C: 59,9W [240V]; D: 52,0W [240V]	—
	Supply current (A) .....:	A: 1,012A [240V; PF: 0,999]; B: 0,447A [240V; PF: 0,969]; C: 0,261A [240V; PF: 0,960]; D: 0,224A [240V; PF: 0,969]	—
	Temperatures in test 1 – 4 below are corrected for ta (°C) .....:	40°C	—
	- abnormal operating mode.....:	LED driver output shorted circuit, output shutdown immediately, the temperature rise of components are lower than temperature rise of components at normal heating test	—
3.12 (12.4)	- test 1: rated voltage .....:	240V	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....:	--	—
	- 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 .....:	--	—
3.12 (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 .....:	264V	—

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

Temperature measurements (°C)							
Part	Ambient	Cl. 12.4 – normal				Cl. 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
tc of LED driver A	40,0	80,4	--	--	90	--	--
tc of LED driver B	40,0	67,4	--	--	90	--	--
tc of LED driver C	40,0	52,4	--	--	90	--	--
tc of LED driver D	40,0	57,7	--	--	80	--	--
Supplementary information: 1. The products suitable for outdoor use only, 10ºC was deducted from each measured temperature. 2. Max. temperatures were recorded.							

	Type reference .....:	A: ST305P; B: ST240P; C: ST200P; D: ST150P; E: ST105P; F: ST060P; G: ST050P; H: ST305P	—
	Lamp used .....:	LED	—
	Lamp control gear used .....:	A: ELGC-300-H-A; B: XLG-240-H-A; C: XLG-200-H-A; D: XLG-150-H-A; E: XLG-100-H-A; F: XLG-75-H-A; G: XLG-50-A; H: XLG-320-H-A	—
	Mounting position of luminaire .....:	As in normal use	—
	Supply wattage (W) .....:	A: 307,4W [240V]; B: 250,5W [240V]; C: 201,8W [240V]; D: 149,0W [240V]; E: 104,8W [240V]; F: 60,3W [240V]; G: 50,4W [240V]; H: 302,1W [240V]	—
	Supply current (A) .....:	A: 1,298A [240V; PF: 0,982]; B: 1,054A [240V; PF: 0,990]; C: 0,864A [240V; PF: 0,973]; D: 0,635A [240V; PF: 0,978]; E: 0,449A [240V; PF: 0,973]; F: 0,258A [240V; PF: 0,970]; G: 0,217A [240V; PF: 0,964]; H: 1,298A [240V; PF: 0,973];	—
	Temperatures in test 1 – 4 below are corrected for ta (°C) .....:	40°C	—

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

	- abnormal operating mode.....:	LED driver output shorted circuit, output shutdown immediately, the temperature rise of components are lower than temperature rise of components at normal heating test	—
3.12 (12.4)	- test 1: rated voltage .....:	240V	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....:	--	—
	- 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 .....:	--	—
3.12 (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 .....:	264V	—

Temperature measurements (°C)

Part	Ambient	Cl. 12.4 – normal				Cl. 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
tc of LED driver A	40,0	82,1	--	--	85	--	--
tc of LED driver B	40,0	74,1	--	--	90	--	--
tc of LED driver C	40,0	82,1	--	--	90	--	--
tc of LED driver D	40,0	76,3	--	--	80	--	--
tc of LED driver E	40,0	69,4	--	--	90	--	--
tc of LED driver F	40,0	61,0	--	--	90	--	--
tc of LED driver G	40,0	61,8	--	--	90	--	--
tc of LED driver H	40,0	76,9	--	--	85	--	--

Supplementary information: 1. The products suitable for outdoor use only, 10°C was deducted from each measured temperature. 2. Max. temperatures were recorded.

	Type reference.....:	ST200M	—
	Lamp used .....:	LED	—
	Lamp control gear used.....:	SS-200EP-56B	—
	Mounting position of luminaire .....:	As in normal use	—
	Supply wattage (W).....:	213,0W [240V]	—
	Supply current (A) .....:	0,896A [240V; PF: 0,986]	—
	Temperatures in test 1 – 4 below are corrected for ta (°C) .....:	40°C	—

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

	- abnormal operating mode.....:	LED driver output shorted circuit, output shutdown immediately, the temperature rise of components are lower than temperature rise of components at normal heating test	—
3.12 (12.4)	- test 1: rated voltage .....:	240V	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....:	1,06 x 240V = 254,4V	—
	- 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 .....:	--	—
3.12 (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 .....:	264V	—

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	40,0	--	30,5	--	90	--	--
WAGO terminal	40,0	--	53,7	--	85	--	--
Input cord of LED driver	40,0	--	61,7	--	105	--	--
tc of LED driver	40,0	72,1	--	--	90	--	--
Output wire of LED driver	40,0	--	66,5	--	105	--	--
Input wire of LED module	40,0	--	69,0	--	90	--	--
LED module PCB	40,0	--	87,8	--	130	--	--
LED lens	40,0	--	99,2	--	Ref.	--	--
Glass cover	40,0	--	70,3	--	200	--	--
Metal enclosure	40,0	--	88,9	--	Ref.	--	--
Mounting surface	40,0		55,0		90	--	--
Objected lighting (0,1m)	40,0	--	39,9	--	90	--	--

Supplementary information: 1. The products suitable for outdoor use only, 10°C was deducted from each measured temperature. 2. Max. temperatures were recorded.

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 3	**Screw terminals (part of the luminaire)**		—
(14)	**SCREW TERMINALS**		N/A
(14.2)	Type of terminal.....:		—
	Rated current (A).....:		—
(14.3.2.1)	One or more conductors		N/A
(14.3.2.2)	Special preparation		N/A
(14.3.2.3)	Terminal size		N/A
	Cross-sectional area (mm²) .....:		—
(14.3.3)	Conductor space (mm) .....:		N/A
(14.4)	Mechanical tests		N/A
(14.4.1)	Minimum distance		N/A
(14.4.2)	Cannot slip out		N/A
(14.4.3)	Special preparation		N/A
(14.4.4)	Nominal diameter of thread (metric ISO thread) .....:	M	N/A
	External wiring		N/A
	No soft metal		N/A
(14.4.5)	Corrosion		N/A
(14.4.6)	Nominal diameter of thread (mm).....:		N/A
	Torque (Nm).....:		N/A
(14.4.7)	Between metal surfaces		N/A
	Lug terminal		N/A
	Mantle terminal		N/A
	Pull test; pull (N) .....:		N/A
(14.4.8)	Without undue damage		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 4	**Screwless terminals (part of the luminaire)**		—
(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
	Terminal size and rating		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

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									N/A
	Voltage drop after 10th alt. 25th cycle									N/A
	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									N/A
	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									N/A
	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									N/A
	Max. allowed voltage drop (mV).....:	--								—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)	--	--	--	--	--	--	--	--	--	--
Supplementary information: --										

Attachment No. 1

IEC60598_2_3M ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT

IEC 60598-2-3
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES
Luminaires
Part 2: Particular requirements
Section 3: Luminaires for road and street lighting

Differences according to .....:	EN 60598-2-3:2003 + A1:2011 used in conjunction with EN IEC 60598-1:2021 + A11:2022
TRF template used .....:	IECEE OD-2020-F2:2020, Ed. 1.1
Attachment Form No. .....:	EU_GD_IEC60598_2_3M
Attachment Originator.....:	UL(Demko)
Master Attachment .....:	2022-05-24

	CENELEC COMMON MODIFICATIONS (EN)		—
3.5 (3)	**MARKING**		—
3.5 (3.2.12)	Note 4 deleted		N/A
3.6 (4)	**CONSTRUCTION**		—
4.7 (4.11.6)	Electro-mechanical contact systems: electric strength test at 1 500 V		N/A
3.10 (5)	**EXTERNAL AND INTERNAL WIRING**		—
3.10 (5.2.2)	Cables equal to EN 50525 (all parts)		P
	Paragraph 2 deleted		P
	Replace table 5.1 – Supply cord		P
3.12 (12)	**ENDURANCE TESTS AND THERMAL TESTS**		—
3.12 (12.4.2c)	Thermal test (normal operation) see footnote c to table 12.2 relating to unsleeved fixed wiring		P
ZB	**ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)**		—
(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
ZC	**ANNEX ZC, NATIONAL DEVIATIONS (EN)**		—
(4 & 5)	FR: Shuttered socket-outlets 10/16A		N/A

Attachment No. 1

IEC60598_2_3M ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	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

TEST REPORT
IEC 62031
LED modules for general lighting – Safety specifications

Report Number.....:	68.140.23.0576.01
Date of issue.....:	2023-10-20
Total number of pages.....	19
Name of Testing Laboratory preparing the Report.....:	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Applicant's name.....:	See main report of IEC 60598-2-3
Address.....:	See main report of IEC 60598-2-3
Test specification:	
Standard.....:	IEC 62031:2018
Test procedure.....:	See main report of IEC 60598-2-3
Non-standard test method.....:	N/A
Test Report Form No. .....:	IEC62031F
Test Report Form(s) Originator....:	Intertek Semko AB
Master TRF.....:	2018-06-14

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description.....:		See main report of IEC 60598-2-3	
Trade Mark.....:		See main report of IEC 60598-2-3	
Manufacturer .....:		See main report of IEC 60598-2-3	
Model/Type reference.....:		See main report of IEC 60598-2-3	
Ratings.....:		See main report of IEC 60598-2-3	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☒	**Testing Laboratory:**	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch	
Testing location/ address.....:		Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District, Shenzhen, Guangdong 518052, China	
Tested by (name, function, signature).....:		See main report of IEC 60598-2-3	
Approved by (name, function, signature)...:		See main report of IEC 60598-2-3	
☐	**Testing procedure: CTF Stage 1:**		
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 2:**		
Testing location/ address.....:			
Tested by (name + signature) .....:			
Witnessed by (name, function, signature)..:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 3:**		
☐	**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) :			

Attachment No. 2

List of Attachments (including a total number of pages in each attachment): See main report of IEC 60598-2-3	
Summary of testing:	
Tests performed (name of test and test clause): See main report of IEC 60598-2-3	**Testing location:** Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District, Shenzhen, Guangdong 518052, China
Summary of compliance with National Differences: See main report of IEC 60598-2-3	

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.

--

Test item particulars ..... :	LED module
Classification of installation and use..... :	Integral module
Supply Connection..... :	Lead wire
..... :	--
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..... :	See main report of IEC 60598-2-3
Date of receipt of test item ..... :	See main report of IEC 60598-2-3
Date (s) of performance of tests..... :	See main report of IEC 60598-2-3

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☒ comma / ☐ point is used as the decimal separator.

Clause numbers between brackets refer to clauses in IEC 61347-1

Name and address of factory (ies)..... : See main report of IEC 60598-2-3

General product information:
It is tested with the product.

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

4	**GENERAL REQUIREMENTS**		—
4.2	Classification		
	Built-in module .....:	Yes ☐ No ☒	—
	Independent module.....:	Yes ☐ No ☒	—
	Integral module .....:	Yes ☒ No ☐	—
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.	(see Annex 1)	N/A

6	**MARKING**		—
6.2	**Contents of marking for built-in and for independent LED modules**		**N/A**
	a) mark of origin		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**

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
- (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 Ω ..... :		**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 mm² 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 kΩ	(see Annex A)	N/A
- (A3)	Voltage > 35 V peak or > 60 V d.c. or protective impendance 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 μF: voltage after 1 min (V): < 50 V ..... :		N/A
- (10.3)	Controlgear providing SELV		N/A

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
	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 (MΩ):		P
	For basic insulation ≥ 2 MΩ .....:	100 MΩ	P
	For double or reinforced insulation ≥ 4 MΩ .....:		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

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
	Basic insulation for SELV, test voltage 500 V	500V	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		P
	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:		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
- (14.2)	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)	P
- (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:		P
	The insulation resistance ≥ 1 MΩ ..... :	100 MΩ	P
	No flammable gases		P
	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		P
- (14.7)	Relevant fault condition tests with high-power a.c. supply and in turn to a d.c. supply		—

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
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**		P
	Creepage distances and clearances according to 16.2 and 16.3		P
	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**		P
- (16.2.2)	Minimum creepage distances for working voltages		P
	Creepage distances according to Table 7	(see appended table)	P
- (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**		P
- (16.3.2)	Clearances for working voltages		P
	Clearances distances according to Table 9	(see appended table)	P
- (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

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
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

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

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	RG1	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		P

12 (14)	**TABLE: tests of fault conditions**	**P**
Part	**Simulated fault**	**Hazard**
LED1 (+/-)	200-240V; Short-circuited; Normal work	NO
LED1 (+/-)	200-240V; Open-circuited; Power decreased a little, Unrecoverable	NO
Remark: Test with luminaires		

15 (16)	**TABLE: clearance and creepage distance measurements (mm)**					**P**
Applicable part of IEC 61347-1 Table 7 – 11*						
Distances	**Insulation type ****	**Measured clearance**	**Required**		**Measured creepage**	**Required**
			clearance	***Table**		**creepage**	***Table**

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

Distance 1:	--	--	--	--	--	--	--
Working voltage (V).....:					--		—
Frequency if applicable (kHz) .....:					--		—
PTI.....:					< 600 ☐ ≥ 600 ☐		—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) .....:					--		—
Pulse voltage if applicable (kV) .....:					--		—
Supplementary information: See table 3.7 (11.2) in main report of IEC 60598-2-3							

** Insulation type: B – Basic; S – Supplementary; R – Reinforced

17 (18.1)	**TABLE: Ball Pressure Test of Thermoplastics**		**N/A**
Allowed impression diameter (mm) .....:		≤ 2mm	—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)
--	--	--	--
Supplementary information: --			

17 (18.2)	**TABLE: Test of printed boards**				**N/A**
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (s)	Ignition of specified layer Yes/No	Duration of burning (s)	Verdict
--	**--**	**--**	**--**	**--**	**--**
Supplementary information: --					

17 (18.3)	**TABLE: Glow-wire test**				**N/A**
Glow wire temperature .....:		650°C			—
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
--	--	--	--	--	--
Any flame or glowing of the sample extinguished within 30 s of withdrawing the glow-wire, and any burning or molten drop did not ignite the underlying parts (Yes/No).....:					--
Supplementary information: --					

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

17 (18.4)	**TABLE: Needle-flame test**				N/A
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
--	--	--	--	--	--
Supplementary information: --					

17 (18.5)	**TABLE: Proof tracking test**				**N/A**
Test voltage PTI .....:		175 V			—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
--	--	--	--	--	--
Supplementary information: --					

(A)	**ANNEX A - TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS A LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK**		—
(A.1)	Comply with A.2 or A.3		N/A
(A.2)	Voltage ≤ 35 V peak or ≤ 60 V d.c .....:		N/A
(A.3)	If voltage measured according Clause A.2 exceeds the limit value; touch current does not exceed 0,7 mA (peak) or 2 mA d.c. ..... :		N/A
	Comply with Annex G.2 of IEC 60598-1		N/A

ANNEX 1	**LED MODULES WITH INTEGRAL CONTROLGEAR PROVIDING SELV**		—
(L.5)	**Protection against electric shock**		N/A
	Comply with 9.2 of IEC 61558-1		N/A
(L.6)	**Heating**		N/A
	No excessive temperatures in normal use		N/A
	Value if capacitor tc marked .....:		—
	Winding insulation classified as Class .....:		—
	Comply with tests of clause 14 of IEC 61558-1 with adjustments		N/A
(L.7)	**Short-circuit and overload protection**		N/A
	Comply with tests of clause 15 of IEC 61558-1 with adjustments		N/A
(L.8)	**Insulation resistance and electric strength**		N/A

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
(L.8.1)	Conditioned 48 h between 91 % and 95 %		N/A
(L.8.2)	Insulation resistance		N/A
	Between input- and output circuits not less than 5 MΩ .....:		N/A
	Between metal parts of class II convertors which are separated from live parts by basic insulation only and the body not less than 5 MΩ .....:		N/A
	Between metal foil in contact with the inner and outer surfaces of enclosures of insulating material not less than 2 MΩ .....:		N/A
(L.8.3)	Electric strength		N/A
	1) Between live parts of input circuits and live parts of output circuits .....:		N/A
	2) Over basic or supplementary insulation between:		N/A
	a) live parts having different polarity .....:		N/A
	b) live parts and body if intended to be connected to protective earth .....:		N/A
	c) accessible metal parts and a metal rod of the same diameter as the flexible cable or cord .....:		N/A
	d) live parts and an intermediate metal part .....:		N/A
	e) intermediate metal parts and the body .....:		N/A
	f) each input circuit and all other input circuits .....:		N/A
	3) Over reinforced insulation between the body and live parts .....:		N/A
(L.9)	**Construction**		N/A
(L.9.1)	Transformer comply with 19.12 of IEC 61558-1 and 19 of IEC 61558-2-6		N/A
	HF transformer comply with 19 of IEC 61558-2-16		N/A
(L.10)	**Components**		N/A
	Protective devices comply with 20.6 – 20.11 of IEC 61558-1		N/A
(L.11)	**Creepage distances, clearances and distances through insulation**		N/A
	Creepage distances and clearances not less than in Clause 16		N/A
	Distance through insulation according Table L.5 in IEC 61347-1		N/A
	1) Basic distance through insulation		N/A
	Required distance (mm) .....:		—
	Measured (mm) .....:		N/A

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

	Supplementary information		—
	2) Supplementary distance through insulation		N/A
	Required distance (mm) .....:		—
	Measured (mm) .....:		N/A
	Supplementary information		—
	3) Reinforced distance through insulation		N/A
	Required distance (mm) .....:		—
	Measured (mm) .....:		N/A
	Supplementary information		—

ANNEX 2	**TABLE: Critical components information**					P
Object / part No.	**Code**	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
See 'ANNEX 1 TABLE: Critical components information' in main report of IEC 60598-2-3 for details.						

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

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 3	**Screw terminals (part of the luminaire)**		—
(14)	**SCREW TERMINALS**		N/A
(14.2)	Type of terminal.....:		—
	Rated current (A).....:		—
(14.3.2.1)	One or more conductors		N/A
(14.3.2.2)	Special preparation		N/A
(14.3.2.3)	Terminal size		N/A
	Cross-sectional area (mm²) .....:		—
(14.3.3)	Conductor space (mm) .....:		N/A
(14.4)	Mechanical tests		N/A
(14.4.1)	Minimum distance		N/A
(14.4.2)	Cannot slip out		N/A
(14.4.3)	Special preparation		N/A
(14.4.4)	Nominal diameter of thread (metric ISO thread) .....:	M	N/A
	External wiring		N/A
	No soft metal		N/A
(14.4.5)	Corrosion		N/A
(14.4.6)	Nominal diameter of thread (mm).....:		N/A
	Torque (Nm).....:		N/A
(14.4.7)	Between metal surfaces		N/A
	Lug terminal		N/A
	Mantle terminal		N/A
	Pull test; pull (N) .....:		N/A
(14.4.8)	Without undue damage		N/A

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
ANNEX 4	**Screwless terminals (part of the luminaire)**		—
(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
(15.5.1)	Terminals internal wiring		N/A
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples).....:		N/A
(15.5.1.2)	Pull test pin or tab terminals (4 N, 4 samples) .....:		N/A
	Insertion force not exceeding 50 N		N/A
(15.5.1.2)	Permanent connections: pull-off test (20 N)		N/A
(15.5.2)	Electrical tests		N/A
	Voltage drop (mV) after 1 h (4 samples).....:		N/A
	Voltage drop of two inseparable joints		N/A
	Number of cycles:		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples) .....:		N/A
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples) .....:		N/A
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples).....:		N/A
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples).....:		N/A
(15.6)	Terminals and connections for external wiring		N/A
(15.6.1)	Conductors		N/A
	Terminal size and rating		N/A

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
(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									N/A
	Voltage drop after 10th alt. 25th cycle									N/A
	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									N/A
	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									N/A
	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									N/A
	Max. allowed voltage drop (mV).....:	--								—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)	--	--	--	--	--	--	--	--	--	--
Supplementary information: --										

Attachment No. 2

IEC62031F - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
ATTACHMENT TO TEST REPORT **IEC 62031:2018** **EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES** (LED modules for general lighting - Safety specifications)			
Differences according to.....: EN IEC 62031: 2020 + A11: 2021			
TRF template used .....: IECEE OD-2020-F2:2022, Ed. 1.2			
Attachment Form No.....: EU_GD_IEC62031F **Attachment Originator .....**: UL Solutions (Demko) **Master Attachment**.....: Dated 2022-09-30			
	CENELEC COMMON MODIFICATIONS (EN)		—
	No Common modifications		**P**
ZA	**ANNEX ZA, NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS**		**P**
ZZ	**ANNEX ZZ, RELATIONSHIP BETWEEN THIS EUROPEAN STANDARD AND THE SAFETY OBJECTIVES OF DIRECTIVE 2014/35/EU [2014 OJ L96] AIMED TO BE COVERED**		**P**

Attachment No. 3

TEST REPORT
IEC TR 62778
Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires

Report Number. .....:	68.140.23.0576.01
Date of issue.....:	2023-10-20
Total number of pages	7
Name of Testing Laboratory preparing the Report.....:	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Applicant's name.....:	See main report of IEC 60598-2-3
Address .....:	See main report of IEC 60598-2-3
Test specification:	
Standard .....:	IEC TR 62778:2014 (Second Edition)
Test procedure .....:	See main report of IEC 60598-2-3
Non-standard test method .....:	N/A
Test Report Form No.....:	IEC62778A
Test Report Form(s) Originator ....:	TÜV SÜD Product Service GmbH
Master TRF .....:	Dated 2016-02

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Attachment No. 3

Test item description .....:		See main report of IEC 60598-2-3	
Trade Mark.....:		See main report of IEC 60598-2-3	
Manufacturer .....:		See main report of IEC 60598-2-3	
Model/Type reference.....:		See main report of IEC 60598-2-3	
Ratings.....:		See main report of IEC 60598-2-3	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☒	**Testing Laboratory:**	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch	
Testing location/ address .....:		Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District, Shenzhen, Guangdong 518052, China	
☐	**Associated CB Testing Laboratory:**		
Testing location/ address .....:			
Tested by (name, function, signature).....:		See main report of IEC 60598-2-3	
Approved by (name, function, signature)...:		See main report of IEC 60598-2-3	
☐	**Testing procedure: CTF Stage 1:**		
Testing location/ address .....:			
Tested by (name, function, signature).....:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 2:**		
Testing location/ address .....:			
Tested by (name + signature) .....:			
Witnessed by (name, function, signature) .:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 3:**		
☐	**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) :			

Attachment No. 3

List of Attachments (including a total number of pages in each attachment): **--**	
Summary of testing:	
Tests performed (name of test and test clause): See main report of IEC 60598-2-3	**Testing location:** Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District, Shenzhen, Guangdong 518052, China
Summary of compliance with National Differences (List of countries addressed): See main report of IEC 60598-2-3	
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.** See main report of IEC 60598-2-3	

Attachment No. 3

Test item particulars.....:	See main report of IEC 60598-2-3
Product evaluated.....:	☐ **LED package** ☐ **LED module** ☐ **Lamp** ☒ **Luminaire**
Rated voltage (V).....:	See main report of IEC 60598-2-3
Rated current (mA).....:	--
Rated CCT (K) .....:	--
Rated Luminance (Mcd/m²).....:	--
Component report data used .....:	☒ **Not applicable** ☐ **LED package** ☐ **LED module** ☐ **Lamp** Report number:
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 ..... :	See main report of IEC 60598-2-3
Date of receipt of test item..... :	See main report of IEC 60598-2-3
Date (s) of performance of tests ..... :	See main report of IEC 60598-2-3
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. **Throughout this report a ☒ comma / ☐ point is used as the decimal separator.**	
Name and address of factory (ies)..... :	See main report of IEC 60598-2-3
General product information: See main report of IEC 60598-2-3	

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

7	**MEASUREMENT INFORMATION FLOW**		**—**
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		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**		**N/A**
	LED package is evaluated as .....:	☐ RG0 unlimited ☐ RG1 unlimited	N/A
	E_{thr} of LED package applies to array		N/A
8	**RISK GROUP CLASSIFICATION**		**—**
	Risk group achieved:		P
	-...Risk Group 0 unlimited		N/A
	-...Risk Group 1 unlimited		P
	- E_{thr} ..... (lx) : Distance to reach RG1..... (m) :		N/A

Attachment No. 3

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

	TABLE: Spectroradiometric measurement		**P**
	Measurement performed on:	☐ LED package ☐ LED module ☐ Lamp ☒ Luminaire	
	Model number……:	ST305P with LED: **A**: Cree® J Series™ 3030 LEDs; **B**: Cree® XLamp® XP-G3 LEDs; ST200M with LED: **C**: 2835R Series	
	Test voltage (V)……:	240V	—
	Test current (A)……....:	--	—
	Test frequency (Hz)……..:	50Hz	—
	Ambient, t (°C)……:	25°C	—
	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	Remark
Correlated colour temperature	CCT	K	--	--
x/y colour coordinates	--	--	--	--
Blue light hazard radiance	L_B	$W/(m^2 \cdot sr^1)$	**A**: 3,995E+03; **B**: 9,920E+03; **C**: 4,118E+03	RG1
Blue light hazard irradiance	E_B	W/m^2	--	--
Luminance	L	cd/m^2	**A**: 4,486E+06; **B**: 8,296E+06; **C**: 4,933E+06	--
Illuminance	E	lx	--	--

Attachment No. 3

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:

Measurement uncertainty statement for IEC TR 62778:2014			
Risk		Units	Expanded Uncertainty; coverage factor (k)
L_B	Blue light hazard radiance	$W/(m^2 \cdot sr^1)$	*U*= 8,10%; k=2

	TABLE: Angular light distribution	**N/A**

Attachment No. 4

TEST REPORT
IEC 62493
Assessment of lighting equipment related to human exposure to electromagnetic fields

Report Number.....:	68.140.23.0576.01
Date of issue .....:	2023-10-20
Total number of pages.....:	12
Name of Testing Laboratory preparing the Report.....:	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Applicant's name .....:	See main report of IEC 60598-2-3
Address .....:	See main report of IEC 60598-2-3
Test specification:	
TRF template used:	IECEE OD-2020-F7:2020; ed. 2.1
Standards .....:	IEC 62493:2015, IEC 62493:2015/AMD1:2022
Test procedure.....:	See main report of IEC 60598-2-3
Test Report Form No. .....:	IEC62493C
Test Report Form(s) Originator....:	UL Solutions (US)
Master TRF.....:	Dated 2023-02-16

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing NCB. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description..... :		See main report of IEC 60598-2-3	
Trademark or brand name..... :		See main report of IEC 60598-2-3	
Manufacturer ..... :		See main report of IEC 60598-2-3	
Model/Type reference(s)..... :		See main report of IEC 60598-2-3	
Ratings..... :		See main report of IEC 60598-2-3	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
■	**Testing Laboratory:**	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch	
Testing location/ address.....:		Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District, Shenzhen, Guangdong 518052, China	
Tested by (name, function, signature).....:		See main report of IEC 60598-2-3	
Approved by (name, function, signature)...:		See main report of IEC 60598-2-3	
□	**Testing procedure: CTF Stage 1:**		
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Approved by (name, function, signature)...:			
□	**Testing procedure: CTF Stage 2:**		
Testing location/ address.....:			
Tested by (name + signature) .....:			
Witnessed by (name, function, signature)..:			
Approved by (name, function, signature)...:			
□	**Testing procedure: CTF Stage 3:**		
□	**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) :			

Attachment No. 4

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

Summary of testing	
Tests performed (name of test, test Clause and date test performed): See main report of IEC 60598-2-3	**Testing location:** Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District, Shenzhen, Guangdong 518052, China

Summary of compliance with National Differences	
Country code	**National differences standard**
See main report of IEC 60598-2-3	

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*).

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 ..... :	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.
See main report of IEC 60598-2-3	

Possible test case verdicts:	
- test case does not apply to the test item……:	N/A (Not Applicable)
- test item does meet the requirement……..:	P (Pass)
- test item does not meet the requirement……:	F (Fail)
Date of receipt of test item……..:	See main report of IEC 60598-2-3
Date (s) of performance of tests……:	See main report of IEC 60598-2-3
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. **Throughout this report a ■ comma / ☐ point is used as the decimal separator.** Note: Throughout this TRF, numerical data taken from IEC standards are using a comma as the decimal separator. **Throughout this report, the term "Test item" is used over terms such as Test object, EUT or DUT.**	
Name and address of factory (ies)……:	See main report of IEC 60598-2-3
General product information (GPI) and other remarks: See main report of IEC 60598-2-3	

Table of Contents:

1 General description of test item

Note: The information in this section has been provided by the applicant.

1.1 Photo(s) of the test item

Photo 1.1.1.....:	see attachment No. 5

Photo 1.1.2.....:	see attachment No. 5

1.2 Test item(s)

No.	Test item name	Unique identification / type / description	Extent of test
1		*All models*	*No tested*
2			
Engineering statement for untested variants / product family:			
Supplementary information: --			

1.3 Port(s)

No.	Port Name	Type	Cable		
			Specified length in m	Attached during test	Shielded
1	Enclosure	Enclosure	-	-	-
2				☐	☐
Supplementary information: --					

1.4 Power rating(s)

Power supply type.....:	☒	AC, 1 phase
	☐	AC, 2 phases
	☐	AC, 3 phases
	☒	Neutral
	☒	Protective Earth
	☐	DC
	☐	Battery, not rechargeable in the device
	☐	Battery, rechargeable in the device
Rated voltage.....:	See main report of IEC 60598-2-3	
Rated frequency.....:	See main report of IEC 60598-2-3	
Rated power .....:	See main report of IEC 60598-2-3	

1.5 **Additional parameters**

Protection class.....:	See main report of IEC 60598-2-3	
Clock frequencies .....:	N/A	
Other parameters.....:	N/A	
Software version .....:	N/A	
Hardware version.....:	N/A	
Dimensions (W x H x D) .....:	See main report of IEC 60598-2-3	
Mounting position.....:	☐	Table-top equipment
	☐	Wall/Ceiling mounted equipment
	☐	Floor standing equipment
	☐	Hand-held equipment
	☒	Other: Fixed

1.6 **Operating mode(s)**

No.	Abbreviation	Detailed description of the operating mode	Used for testing	
			Emission	Immunity
1			☐	☐
2			☐	☐
Supplementary information: --				

1.7 **Auxiliary equipment**

Advice to the TRF User: Include accessories which are not to be considered test items.

No.	Aux Item Name	Type and description	Manufacturer (if not the same)
1			
2			
Supplementary information: --			

1.8 **Documents as provided by the applicant**

No.	Document ref.	Type and description	Doc date
1		See main report of IEC 60598-2-3	
2			
Supplementary information: --			

1.9 **Modifications to the test item during testing**

☐	No modifications done during testing	
☐	Modifications done during testing (see details below)	
No.	**Description of modification (if any)**	**Date of modification**
1		
2		
Supplementary information: --		

2 Verdict summary section

Rationale for verdicts, including N/A (Not Applicable), are listed on each test sheet.
If applicable test was not performed then CB Test Certificate cannot be issued.

Table/ Clause	Requirement – Test case	Basic standard	Verdict
6.6	Calculation of the results	IEC 62493: 2022	*N/A*
7.2	Low-power exclusion method	IEC 62493: 2022	*N/A*
7.3	Application of the EMF product standard for body worn-equipment	IEC 62209-2: 2010	*N/A*
7.4	Application of the EMF product standard for base stations	IEC 62232: 2011	*N/A*
7.5	Application of another EMF standard	IEC 62311: 2007	*N/A*
Supplementary information (e.g. detailed information to verdicts):			

2.1 **Test setups**

Figure 2.1.1..... :	Test setup 1

Figure 2.1.2..... :	Test setup 2

3 Limits

3.1 General

Devices must either be inherently compliant in 4.2.2 or comply with Van der Hoofden test limit in 4.2.3 and pass assessment procedure for intentional radiators in 4.3

4.2 Unintentional radiating part of lighting equipment

4.2.2 Lighting equipment deemed to comply with the Van der Hoofden test without testing

Name.....:	See main report of IEC 60598-2-3
Date.....:	See main report of IEC 60598-2-3
Rationale for verdict N/A .....:	Considering submitted samples were LED-light-source technology, they were found to comply with the requirement of EN 62493:2015+A1:2022 without test.

Lighting equipment is deemed to comply with the requirements of this standard without testing if it fulfils one of the following inherent-compliance conditions:	☐	electronic controlgear
	☐	incandescent-lamp technology
	☒	LED-light-source technology
	☐	OLED-light-source technology
	☐	high-pressure discharge lamp LED-light-source technologies
	☐	low-pressure discharge lamp technologies with exposure distance ≥ 50 cm
	☐	independent auxiliary
Supplementary information.....:	--	

4.2.3 Application of limits

Name.....:	N/A
Date.....:	N/A
Rationale for verdict N/A .....:	N/A

☐	Lighting equipment does not inherently comply with the Van der Hoofden test without testing but the compliance factor *F* is ≤ 1
Supplementary information.....:	

5.6 **Measurement uncertainty**

Where relevant, the following measurement instrumentation uncertainty levels have been estimated for tests performed on the apparatus:

Type of disturbance / Test method	Calculated expanded uncertainty U_{Lab}	U_{basic}
Van der Hoofden Test		30%

5.8 **Decision rule**

If the uncertainty calculated with the instrumentation actually used for the test (Ulab) is less than or equal to the uncertainty given in 5.6 (Ubasic) then:

– compliance is deemed if the measurement result does not exceed the applicable limit;

– non-compliance is deemed to occur if the measurement result exceeds the applicable limit.

If the uncertainty calculated with the instrumentation used for the test ( ) is higher than the uncertainty given in 5.6 (Ubasic) then:

– compliance is deemed to occur if the measurement result, increased by (Ulab − Ubasic), does not exceed the applicable limit.

– non-compliance is deemed to occur if the measurement result, increased by (Ulab − Ubasic), exceeds the applicable limit.

6.2 **Operating Conditions**

Name.....:	
Date.....:	
Rationale for verdict N/A .....:	

Test location (stand).....:		
Stabilization Time.....:	☐	15 minutes for low-pressure discharge lamps
	☐	30 minutes for all other discharge lamps
	☐	Other (minutes):
Operating Conditions: .....:	☐	Specified by the manufacturer (ref. cl. 1.6)
	☐	Multiple lamp lighting equipment with all lamps operated simultaneously
	☐	Self-contained emergency lighting operated from mains
	☐	Lighting equipment with light regulation measured at the minimum and maximum limit of light regulation.
Measurement Distance .....:		
Supplementary information.....:		

Photo 6.2.1 ..... :	Test Setup – Van der Hoofden

Test results for Induced internal electric field	
Test item no(s) ref. cl. 1.2.....:	
Operating mode no(s) ref. cl. 1.6.:	
Test setup no(s) ref. cl. 3.2.....:	

7 Assessment procedure intentional radiators

Name.....:	
Date.....:	
Rationale for verdict N/A .....:	

7.2 **Low-power exclusion method**

Input $P_{int,rad}$.....:		
Exclusion level P_{max} .....:		
Input power $P_{int,rad}$ < exclusion level P_{max}	☐	Yes
	☐	No
Supplementary information.....:		

7.3 Application of the EMF product standard for body worn-equipment

If low-power exclusion is not met and exposure distance ≤ 0.05 m, does device comply with IEC 62209-2	☐	Yes
	☐	No
Supplementary information.....:		

7.4 Application of the EMF product standard for base stations

If low-power exclusion is not met and intentional radiator is a base station, does device comply with IEC 62232	☐	Yes
	☐	No
Supplementary information.....:		

7.5 Application of another EMF standard

If low-power exclusion is not met and intentional radiator is not considered as body-worn equipment or base station equipment, does device comply with IEC 62311	☐	Yes
	☐	No
Supplementary information.....:		

8 List of test equipment

Reference to test stand or test name (ID):			
Equipment ID	***Equipment description***	***Last Calibration date***	***Calibration due date***
--	--	--	--

Attachment No. 5

Details of: Outlook view for P series models

Representative model: ST305P

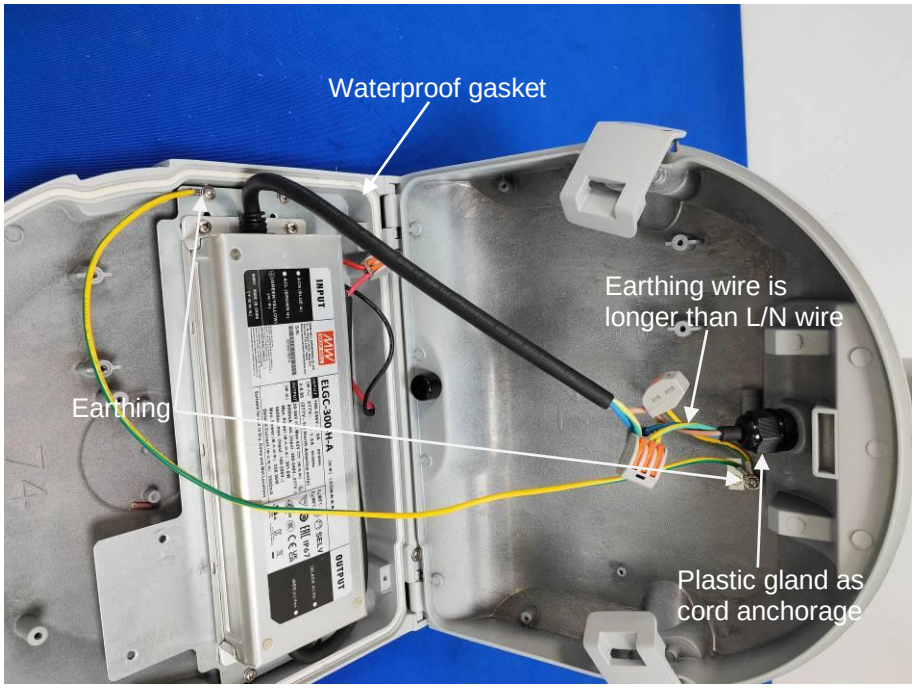
Details of: Outlook view for P series models

Representative model: ST305P

Attachment No. 5

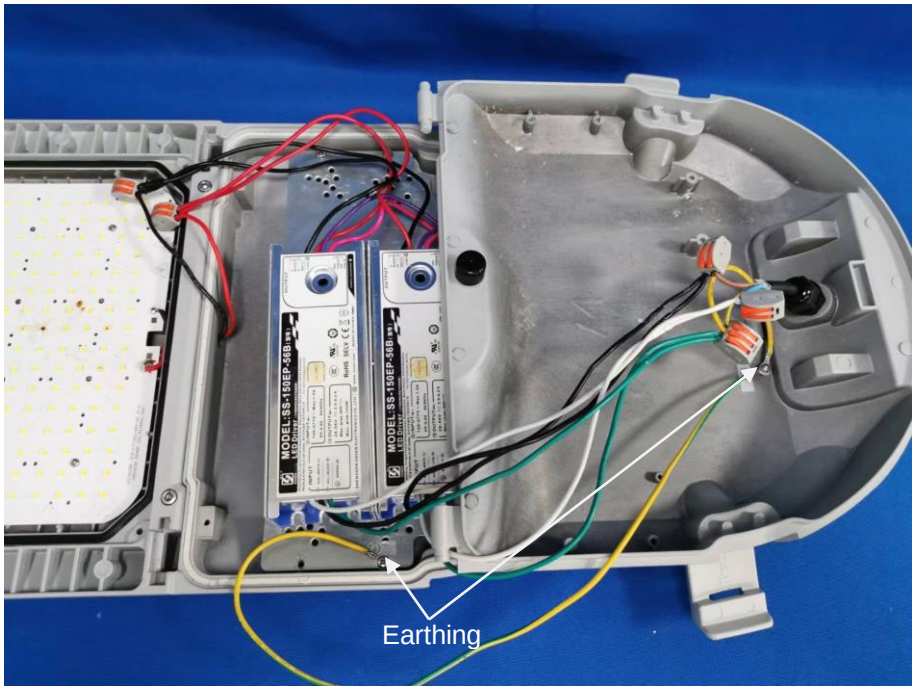
Details of: Internal view for P series models with one LED driver

Representative model: ST305P



Details of: Internal view for P series models with two LED drivers

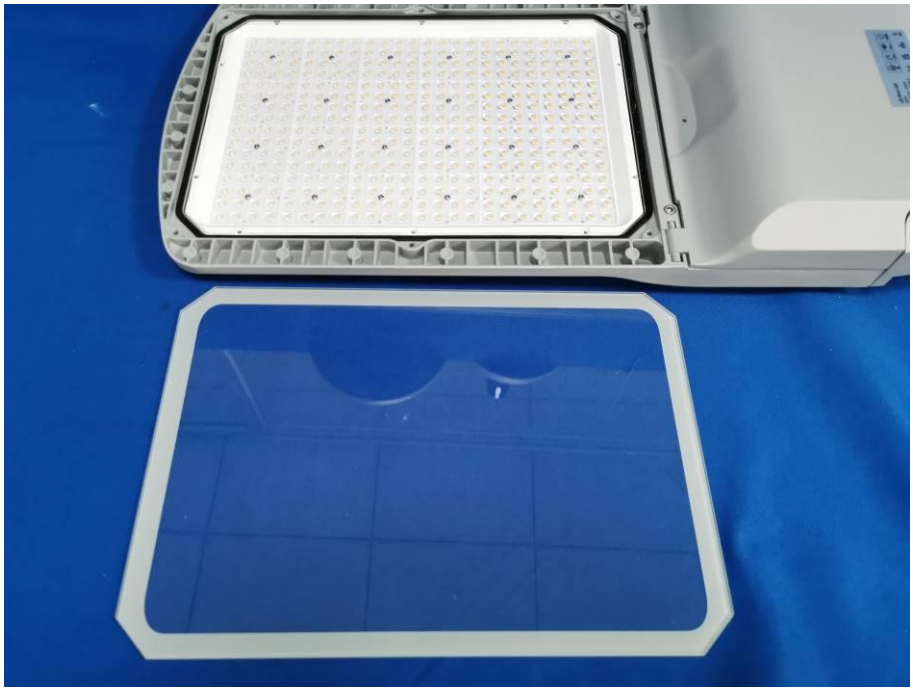
Representative model: ST305P



Attachment No. 5

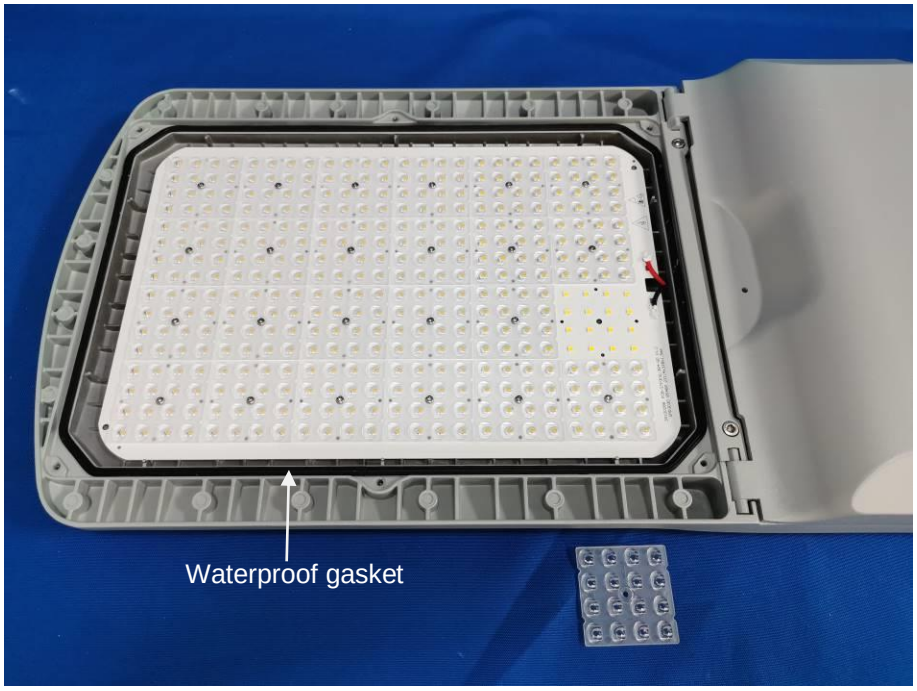
Details of: Internal view for P series models

Representative model: ST305P



Details of: LED module PCB view for P series models

Representative model: ST305P



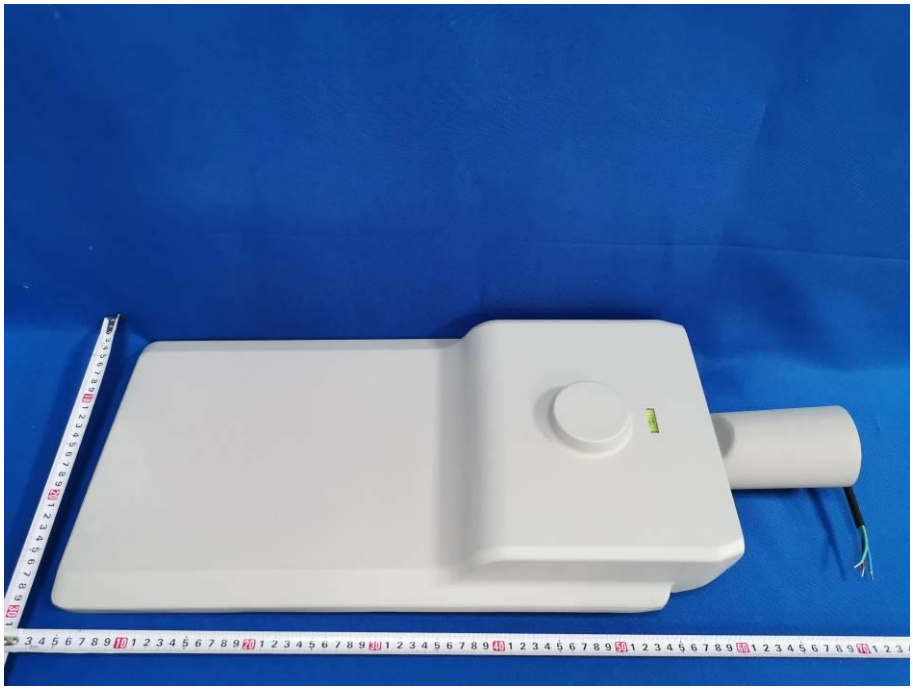
Attachment No. 5

Details of: Outlook view for M series models

Representative model: ST200M

Details of: Outlook view for M series models

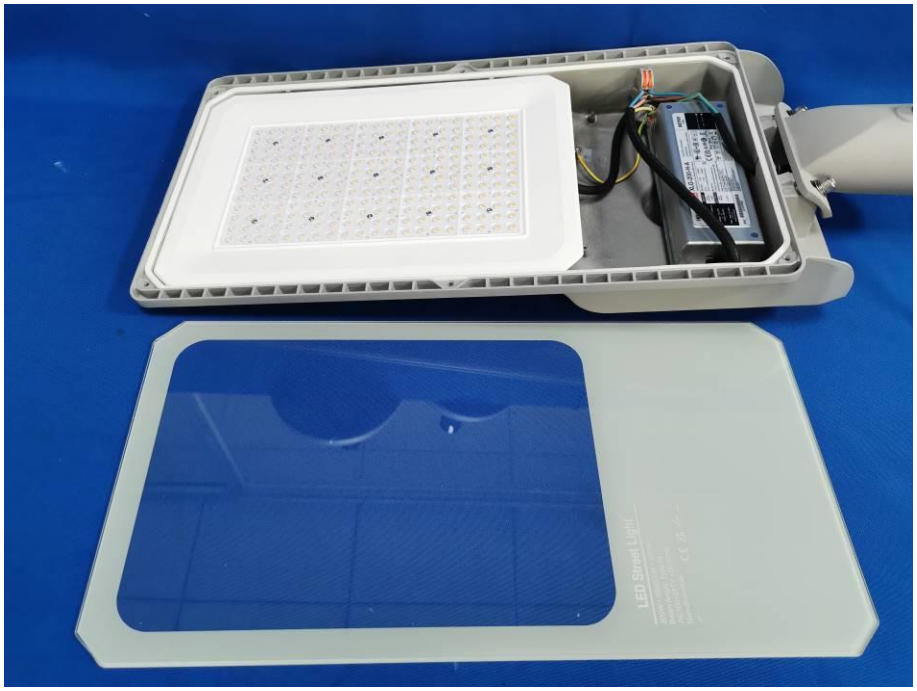
Representative model: ST200M



Attachment No. 5

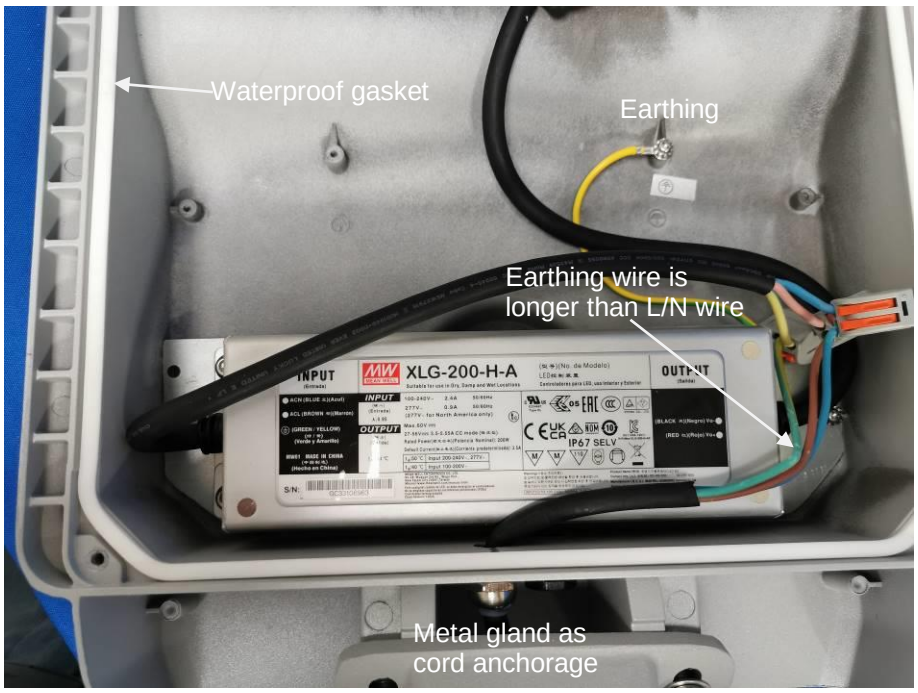
Details of: Internal view for M series models

Representative model: ST200M



Details of: Internal view for M series models

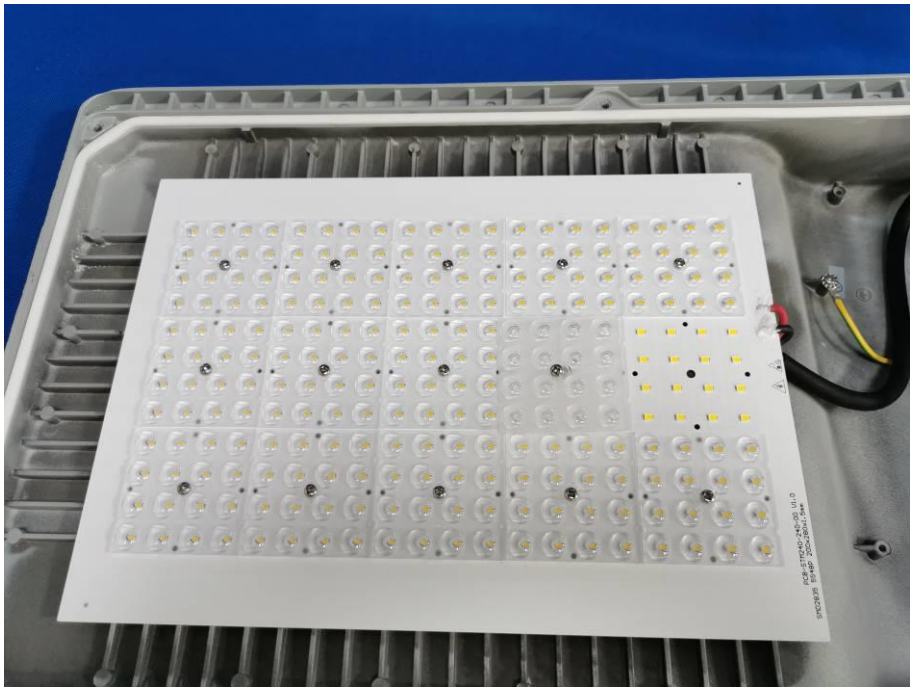
Representative model: ST200M



Attachment No. 5

Details of: LED module PCB view for M series models

Representative model: ST200M



Details of: LED driver view (ELGC-300-H-A)

Attachment No. 5

Details of: XLG series LED driver view

Representative model: XLG-320-H-A

Details of: SS series LED driver view

Representative model: SS-240EP-56B

*****End of Report*****