Test Report issued under the responsibility of:

TEST REPORT
IEC 60598-2-21
Part 2: Particular requirements
Section 21: Rope Lights

Report Number. .....:	GZES170701248101
Date of issue .....:	2018-01-16
Total number of pages.....	38
Name of Testing Laboratory preparing the Report.....:	SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch
Applicant's name.....:	Blueview Elec-optic Tech Co., Ltd.
Address .....:	1000, Section 2, 2nd Konggang, Southwest Aviation Industrial Development Zone, Chengdu, Sichuan, China
Test specification:	
Standard.....:	IEC 60598-2-21:2014 (First Edition) used in conjunction with IEC 60598-1:2014 (Eighth Edition)
Test procedure .....:	CE/LVD
Non-standard test method .....:	N/A
Test Report Form No.....:	IEC60598_2_21A
Test Report Form(s) Originator ....:	DEKRA Certification B.V.
Master TRF.....:	2016-01

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General disclaimer:

The test results presented in this report relate only to the object tested.
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Test item description ..... :	LED rope light
Trade Mark ..... :	—
Manufacturer ..... :	Same as applicant
Model/Type reference ..... :	AN2-4
Ratings ..... :	220 – 240 V, 50 / 60 Hz, max: 500 W non replaceable LED module, IP67, Class II

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☒	**CB Testing Laboratory:**	SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch	
Testing location/ address..... :		198 Kezhu Road, Science City, Economic & Technology Development Area, Guangzhou, Guangdong, China	
☐	**Associated CB Testing Laboratory:**	N/A	
Testing location/ address..... :			
Tested by (name, function, signature)..... :		Kenneth Wei	
Approved by (name, function, signature)... :		Karen Xie	
☐	**Testing procedure: CTF Stage 1:**	N/A	
Testing location/ address..... :			
Tested by (name, function, signature)..... :			
Approved by (name, function, signature)... :			
☐	**Testing procedure: CTF Stage 2:**	N/A	
Testing location/ address..... :			
Tested by (name + signature) ..... :			
Witnessed by (name, function, signature) . :			
Approved by (name, function, signature)... :			
☐	**Testing procedure: CTF Stage 3:**	N/A	
☐	**Testing procedure: CTF Stage 4:**	N/A	
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 1: Additional requirement of EN 62031 (5 pages);

Attachment 2: EN 62493 (1 page);

Attachment 3: photo document (3 pages);

Attachment 4: Additional requirement of EN 61347-2-13: 2014 + A1: 2017 (12 pages);

Summary of testing:

The submitted sample was found to compliance with EN 60598-2-21: 2015 used in conjunction with EN 60598-1: 2015

Photobiological hazard measurements have been tested according to Technical report IEC/TR 62778: 2014 (Ed 2). According to the test results, the product belongs to RG0 and therefore no markings are required on the product or in the instructions.

LED module was found to compliance with EN 62031: 2008 + A1: 2013 + A2: 2015.

LED driver were found to compliance with EN 61347-2-13: 2014 + A1: 2017 used in conjunction with EN 61347-1: 2015;

The submitted sample was found to compliance with EN 62493: 2015.

Tests performed (name of test and test clause):	**Testing location:**
21.6 Marking 21.7 Construction 21.8 Creepage distance and clearances 21.9 Provision for earthing 21.10 Terminals 21.11 External and internal wiring 21.12 Protection against electric shock 21.13 Endurance test and thermal test 21.14 Resistance to dust and moisture 21.15 Insulation resistance and electric strength 21.16 Resistance to heat, fire and tracking IEC 61347-2-13: 2014 + A1: 2016 equal to EN 61347-2-13: 2014 IEC 60598-2-21: 2014 equal to EN 60598-2-21: 2015	198 Kezhu Road, Science City, Economic & Technology Development Area, Guangzhou, Guangdong, China

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

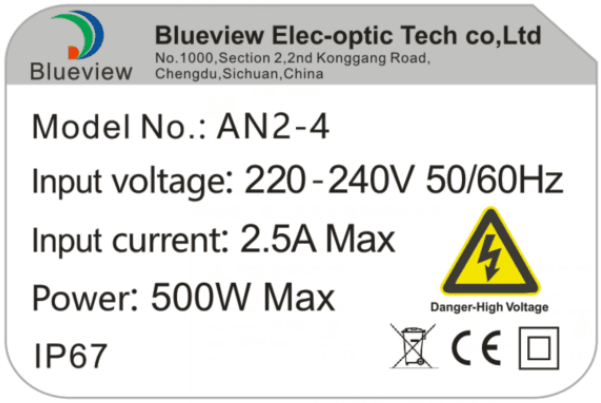
Deviation for European have been taken into account.

☒ **The product fulfils the requirements of** IEC 60598-2-21: 2014, IEC 60598-1: 2014, EN 60598-2-21: 2015, EN 60598-1: 2015, EN 62493: 2015

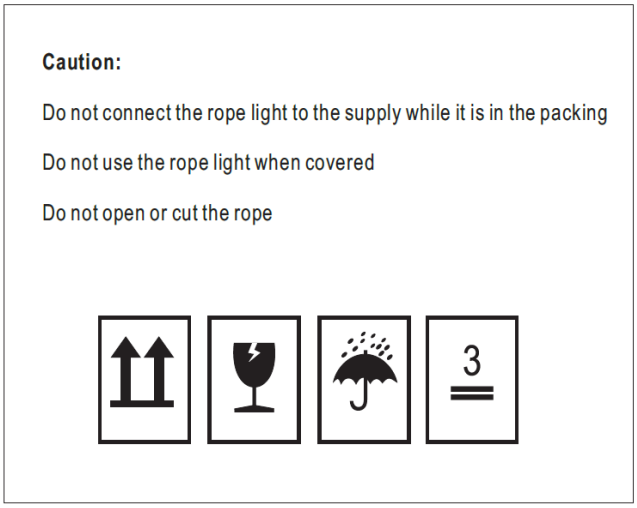
Copy of marking plate:

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.

Attached to the lamp



Attached to the packing and Rope Lights



Remark on above marking:

1. The height of graphical symbols is not less than 5 mm;
2. The height of letters and numerals are not less than 2 mm.
3. According to the standard, warning and text required by the standard should be written in the official language(s) of the country in which the appliance is to be sold. The applicant should ensure that the samples in future production fulfill the requirement.
4. As declared by the applicant, the importer **(and manufacturer, if it is different)**'s name, registered trade name or registered trade mark and the postal address will be marked on the products before being place on the market. The contact details shall be in a language easily understood by end-users and market surveillance authorities.
5. Marking on the packaging or in a document accompanying the electrical equipment is only acceptable if it is not possible to place such markings on the product.

Test item particulars.....:	
Classification of installation and use.....:	LED rope light for fixed mounting
Supply Connection.....:	Non-detachable flexible cable fitted with plug
Class of equipment .....:	Class II
Degree of protection .....:	IP67
Mass of the equipment.....:	0,3 kg / m
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing.....:	
Date of receipt of test item .....:	2017-07-25
Date (s) of performance of tests.....:	2017-07-25 to 2017-01-19

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.

When determining for test conclusion, measurement uncertainty of tests has been considered.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... :	☐ **Yes** ☒ **Not applicable**

When differences exist; they shall be identified in the General product information section.
Name and address of factory (ies) ..... : Same as applicant
General product information: LED rope light for fixed mounting, IP67, Class II, connect to power supply via plug.

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict

21.4 (0)	**GENERAL TEST REQUIREMENTS**		
21.4 (0.1)	Information for luminaire design considered ..... :	Yes ☒ No ☐ Lamp standard: IEC 62031	—
21.4 (0.3)	More sections applicable..... :	Yes ☐ No ☒ Section/s:	—

21.5 (2)	**CLASSIFICATION**		P
21.5 (2.2)	Type of protection ..... :	Class II	P
21.5 (2.3)	Degree of protection..... :	IP67	P
21.5 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces ..... :	Yes ☒ No ☐	—
21.5 (2.5)	Luminaire for normal use ..... :	Yes ☒ No ☐	—
	Luminaire for rough service ..... :	Yes ☐ No ☒	—
21.5.2 (-)	Class II or Class III		P
21.5.3 (-)	Rope lights for outdoor use shall be IP44 or higher		P

21.6 (3)	**MARKING**		P
21.6 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
21.6 (3.3)	Additional information		N/A
	Language of instructions	English	P
21.6 (3.3.1)	Combination luminaires		N/A
21.6 (3.3.2)	Nominal frequency in Hz		P
21.6 (3.3.3)	Operating temperature		N/A
21.6 (3.3.4)	Symbol or warning notice		N/A
21.6 (3.3.5)	Wiring diagram		N/A
21.6 (3.3.6)	Special conditions		N/A
21.6 (3.3.7)	Metal halide lamp luminaire – warning		N/A
21.6 (3.3.8)	Limitation for semi-luminaires		N/A
21.6 (3.3.9)	Power factor and supply current		P
21.6 (3.3.10)	Suitability for use indoors		N/A
21.6 (3.3.11)	Luminaires with remote control		N/A

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict
21.6 (3.3.12)	Clip-mounted luminaire – warning		N/A
21.6 (3.3.13)	Specifications of protective shields		N/A
21.6 (3.3.14)	Symbol for nature of supply		N/A
21.6 (3.3.15)	Rated current of socket outlet		N/A
21.6 (3.3.16)	Rough service luminaire		N/A
21.6 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments	Type Z	P
21.6 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A
21.6 (3.3.19)	Protective conductor current in instruction if applicable		N/A
21.6 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
21.6 (3.3.21)	Non replaceable and non-user replaceable light sources information provided		P
	Cautionary symbol		N/A
21.6 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
21.6 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P
21.6.2 (-)	**Rope light marking**		**P**
	Rated voltage and wattage marked on the rope light		P
	Durable non-removable label if information on the cable		P
21.6.3 (-)	**Rope light and packing marking**		N/A
	Marking if only for indoor use		N/A
21.6.4 (-)	**Marking on the packing or instructions**		**P**
	Marking a) – e)		P
21.7 (4)	**CONSTRUCTION**		P
21.7 (4.2)	Components replaceable without difficulty		P

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict
21.7 (4.3)	Wireways smooth and free from sharp edges		P
21.7 (4.4)	**Lampholders**		N/A
21.7 (4.4.1)	Integral lampholder		N/A
21.7 (4.4.2)	Wiring connection		N/A
21.7 (4.4.3)	Lampholder for end-to-end mounting		N/A
21.7 (4.4.4)	Positioning		N/A
	- pressure test (N) ..... :		—
	After test the lampholder comply with relevant standard sheets and show no damage		N/A
	After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation		N/A
	- bending test (N) ..... :		—
	After test the lampholder have not moved from its position and show no permanent deformation		N/A
21.7 (4.4.5)	Peak pulse voltage		N/A
21.7 (4.4.6)	Centre contact		N/A
21.7 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A
21.7 (4.4.8)	Lamp connectors		N/A
21.7 (4.4.9)	Caps and bases correctly used		N/A
21.7 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N/A
21.7 (4.5)	**Starter holders**		N/A
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
21.7 (4.7)	**Terminals and supply connections**		N/A
21.7 (4.7.1)	Contact to metal parts		N/A
21.7 (4.7.2)	Test 8 mm live conductor		N/A
	Test 8 mm earth conductor		N/A
21.7 (4.7.3)	Terminals for supply conductors		N/A
21.7 (4.7.3.1)	Welded method and material		N/A
	- stranded or solid conductor		N/A
	- spot welding		N/A
	- welding between wires		N/A
	- Type Z attachment		N/A

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict
	- mechanical test according to 15.6.2		N/A
	- electrical test according to 15.6.3		N/A
	- heat test according to 15.6.2.3 and 15.6.2.4		N/A
21.7 (4.7.4)	Terminals other than supply connection		N/A
21.7 (4.7.5)	Heat-resistant wiring/sleeves		N/A
21.7 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A
21.7 (4.8)	**Switches**		N/A
	- adequate rating		N/A
	- adequate fixing		N/A
	- polarized supply		N/A
	- compliance with IEC 61058-1 for electronic switches		N/A
21.7 (4.9)	**Insulating lining and sleeves**		N/A
21.7 (4.9.1)	Retainment		N/A
	Method of fixing ..... :		N/A
21.7 (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
21.7 (4.10)	**Double or reinforced insulation**		**P**
21.7 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		P
	Safe installation fixed luminaires		P
	Capacitors and switches		N/A
	Interference suppression capacitors according to IEC 60384-14		N/A
21.7 (4.10.2)	Assembly gaps:		N/A
	- not coincidental		N/A
	- no straight access with test probe		N/A
21.7 (4.10.3)	Retainment of insulation:		P
	- fixed		P
	- unable to be replaced; luminaire inoperative		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- sleeves retained in position		N/A
	- lining in lampholder		N/A
21.7 (4.11)	**Electrical connections and current-carrying parts**		N/A
21.7 (4.11.1)	Contact pressure		N/A
21.7 (4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
21.7 (4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
21.7 (4.11.4)	Material of current-carrying parts		P
21.7 (4.11.5)	No contact to wood or mounting surface		P
21.7 (4.11.6)	Electro-mechanical contact systems		N/A
21.7 (4.12)	**Screws and connections (mechanical) and glands**		N/A
21.7 (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
21.7 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
21.7 (4.12.4)	Locked connections:		N/A
	- fixed arms; torque (Nm) ..... :		N/A
	- lampholder; torque (Nm) ..... :		N/A
	- push-button switches; torque 0,8 Nm ..... :		N/A
21.7 (4.12.5)	Screwed glands; force (Nm)..... :		N/A
21.7 (4.13)	**Mechanical strength**		N/A
21.7 (4.13.1)	Impact tests:		N/A

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict
	- fragile parts; energy (Nm) ..... :		N/A
	- other parts; energy (Nm)..... :		N/A
	1) live parts		N/A
	2) linings		N/A
	3) protection		N/A
	4) covers		N/A
21.7 (4.13.3)	Straight test finger		N/A
21.7 (4.13.4)	Rough service luminaires		N/A
	- IP54 or higher		N/A
	a) fixed		N/A
	b) hand-held		N/A
	c) delivered with a stand		N/A
	d) for temporary installations and suitable for mounting on a stand		N/A
21.7 (4.13.6)	Tumbling barrel		N/A
21.7 (4.14)	**Suspensions, fixings and means of adjusting**		**P**
21.7 (4.14.1)	Mechanical load:		P
	A) four times the weight	0,3 kg / m x 4 = 1,2 kg / m	P
	B) torque 2,5 Nm		N/A
	C) bracket arm; bending moment (Nm)..... :		N/A
	D) load track-mounted luminaires		N/A
	E) clip-mounted luminaires, glass-shelve. Thickness (mm) ..... :		N/A
	Metal rod. diameter (mm) ..... :		N/A
	Fixed luminaire or independent control gear without fixing devices		N/A
21.7 (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

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict
21.7 (4.14.3)	Adjusting devices:		N/A
	- flexing test; number of cycles..... :		N/A
	- strands broken ..... :		N/A
	- electric strength test afterwards		N/A
21.7 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
21.7 (4.14.5)	Guide pulleys		N/A
21.7 (4.14.6)	Strain on socket-outlets		N/A
21.7 (4.15)	**Flammable materials**		P
	- glow-wire test 650°C ..... :	See Test Table 21.16 (13.3.2)	P
	- spacing ≥30 mm		N/A
	- screen withstanding test of 13.3.1		N/A
	- screen dimensions		N/A
	- no fiercely burning material		N/A
	- thermal protection		N/A
	- electronic circuits exempted		N/A
21.7 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		N/A
	a) construction		N/A
	b) temperature sensing control		N/A
	c) surface temperature		N/A
21.7 (4.16)	**Luminaires for mounting on normally flammable surfaces**		**P**
	No lamp control gear..... :	(compliance with Section 12)	N/A
21.7 (4.16.1)	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
21.7 (4.16.2)	Thermal protection:		N/A
	- in lamp control gear		N/A
	- external		N/A
	- fixed position		N/A
	- temperature marked lamp control gear		N/A

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict
21.7 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	
21.7 (4.17)	**Drain holes**		N/A
	Clearance at least 5 mm		N/A
21.7 (4.18)	**Resistance to corrosion**		P
21.7 (4.18.1)	- rust-resistance		P
21.7 (4.18.2)	- season cracking in copper		N/A
21.7 (4.18.3)	- corrosion of aluminium		N/A
21.7 (4.19)	Ignitors compatible with ballast		N/A
21.7 (4.20)	Rough service vibration		N/A
21.7 (4.21)	**Protective shield**		N/A
21.7 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A
	Shield of glass if tungsten halogen lamps		N/A
21.7 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
21.7 (4.21.3)	No direct path		N/A
21.7 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment..... :	See Test Table 21.16 (13.3.2)	N/A
21.7 (4.22)	Attachments to lamps not cause overheating or damage		N/A
21.7 (4.23)	Semi-luminaires comply Class II		N/A
21.7 (4.24)	**Photobiological hazards**		**P**
21.7 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N/A
21.7 (4.24.2)	Retinal blue light hazard		P
	Luminaires with E_{thr} :		P
	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	RG0	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778		N/A
	Portable luminaires for children IEC 60598-2-10 and Mains socket outlet nightlights IEC 60598-2-12 not exceed RG1 at 200 mm according to IEC/62778		N/A
21.7 (4.25)	**Mechanical hazard**		**P**
	No sharp point or edges		P
21.7 (4.26)	**Short-circuit protection**		N/A
21.7 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N/A
21.7 (4.26.2)	Short-circuit test with test chain according 4.26.3		N/A
	Test chain not melt through		N/A
	Test sample not exceed values of Table 12.1 and 12.2		N/A
21.7 (4.27)	**Terminal blocks with integrated screwless earthing contacts**		N/A
	Test according Annex V		N/A
	Pull test of terminal fixing (20 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Pull test of mechanical connection (50 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Voltage drop test, resistance < 0,05 Ω		N/A
21.7 (4.28)	**Fixing of thermal sensing control**		N/A
	Not plug-in or easily replaceable type		N/A
	Reliably kept in position		N/A
	No adhesive fixing if UV radiations from a lamp can degrade the fixing		N/A
	Not outside the luminaire enclosure		N/A
	Test of adhesive fixing:		N/A
	Max. temperature on adhesive material (°C) ..... :		—
	100 cycles between t min and t max		N/A
	Temperature sensing control still in position		N/A
21.7 (4.29)	**Luminaires with non-replaceable light source**		N/A
	Not possible to replace light source		N/A
	Live part not accessible after parts have been opened by hand or tools		N/A
21.7 (4.30)	**Luminaires with non-user replaceable light source**		N/A

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		N/A
	Minimum two fixing means		N/A
21.7 (4.31)	**Insulation between circuits**		N/A
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3		N/A
	Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfil requirements according 4.31.1 – 4.31.3		N/A
21.7 (4.31.1)	SELV circuits		N/A
	Used SELV source		N/A
	Voltage ≤ ELV		N/A
	Insulating of SELV circuits from LV supply		N/A
	Insulating of SELV circuits from other non SELV circuits		N/A
	Insulating of SELV circuits from FELV		N/A
	Insulating of SELV circuits from other SELV circuits		N/A
	SELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Plugs and socket-outlets does not have protective conductor contact		N/A
21.7 (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 enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Socket-outlets does not have protective conductor contact		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
21.7 (4.31.3)	Other circuits		N/A
	Other circuits insulated from accessible parts according Table X.1		N/A
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		N/A
	- conductive parts are connected together		N/A
	- test according 7.2.3		N/A
	- conductive part not cause an electric shock in case of an insulation fault		N/A
	- equipotential bonding in master/slave applications		N/A
	- master luminaire provided with terminal for accessible conductive parts of slave luminaires		N/A
	- slave luminaire constructed as class I		N/A
21.7 (4.32)	**Overvoltage protective devices**		N/A
	Comply with IEC 61643-11		N/A
	External to controlgear and connected to earth:		N/A
	- only in fixed luminaires		N/A
	- only connected to protective earth		N/A
21.7.2 (-)	**Terminal blocks**		N/A
	Clause 4.6 of IEC 60598-1 referring to terminal blocks does not apply		—
21.7.3 (-)	**Terminals and supply connections**		N/A
	Comply with Annex A		N/A
21.7.4 (-)	**Control units**		**P**
	Forming an integral part enclosed in non-flammable insulating material tested according 21.16		P
	Securely fixed to the cable		P
	Electronic control device comply with IEC 61347-2-11		N/A
	LED driver comply with IEC 61347-2-13		P
21.7.5 (-)	**Mechanical strength**		**P**
	a) Rigid rope lights		N/A
	1) Pull test: force 60 N		N/A
	2) Torque test: torque 0,15 Nm		N/A
	b) Flexible rope lights		P
	1) Pull test: force 60 N		P
	2) Torque test: torque 0,15 Nm		P

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Clause	Requirement + Test	Result - Remark	Verdict
	3) Cylinder 150 mm @ 10 times at 25 °C ± 2 °C		P
	For rope lights having an IP number over X0 Additionally: Cylinder 150 mm @ 10 times at -15 °C ± 2 °C		P
	4) Mandrel of between 4 and 5 times the diameter of test piece		P
	c) Impact test at low temperature of -15 °C ± 5 °C		P
21.8 (11)	**CREEPAGE DISTANCES AND CLEARANCES**		P
21.8 (11.2)	Creepage distances and clearances ..... :	See Table 21.8 (11.2)	P
	Working voltage (V) ..... :	240	—
	Rated pulse voltage (kV) ..... :	—	—
	Voltage form ..... :	Sinusoidal ☒ Non-sinusoidal ☐	—
	PTI ..... :	< 600 ☒ ≥ 600 ☐	—
	Impulse withstand category (Normal category II) (Category III Annex U)	Category II ☒ Category III ☐	—
21.10 (14)	**SCREW TERMINALS**		N/A
	Separately approved; component list		N/A
	Part of the luminaire		N/A
21.10 (15)	**SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS**		N/A
	Separately approved; component list ..... :		N/A
	Part of the luminaire ..... :		N/A
21.11 (5)	**EXTERNAL AND INTERNAL WIRING**		P
21.11 (5.2)	**Supply connection and external wiring**		P
21.11 (5.2.1)	Means of connection ..... :	Non-detachable flexible cable fitted with plug	P
	Outdoor luminaire has not PVC insulated external wiring if not class III or SELV ≤ 25 V a.c./60 V d.c. or protected from outdoor environment		P
21.11 (5.2.2)	Type of cable ..... :	Replaced by 21.11.2	—
	Nominal cross-sectional area (mm²) ..... :	Replaced by 21.11.2	—
	Cables equal to IEC 60227 or IEC 60245	Replaced by 21.11.2	—

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Clause	Requirement + Test	Result - Remark	Verdict
21.11 (5.2.3)	Type of attachment, X, Y or Z	Type Z	P
21.11 (5.2.5)	Type Z not connected to screws		P
21.11 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
21.11 (5.2.7)	Cable entries through rigid material have rounded edges		N/A
21.11 (5.2.8)	Insulating bushings:		N/A
	- suitably fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- tubes or guards made of insulating material		N/A
21.11 (5.2.9)	Locking of screwed bushings		N/A
21.11 (5.2.10)	Cord anchorage:		P
	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		P
	- no tying of cables into knots etc.		P
	- insulating material or lining		N/A
21.11 (5.2.10.1)	Cord anchorage for type X attachment:		N/A
	a) at least one part fixed		N/A
	b) types of cable		N/A
	c) no damaging of the cable		N/A
	d) whole cable can be mounted		N/A
	e) no touching of clamping screws		N/A
	f) metal screw not directly on cable		N/A
	g) replacement without special tool		N/A
	Glands not used as anchorage		N/A
	Labyrinth type anchorages		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
21.11 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		P
21.11 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N) ..... :	60	P
	- torque test: torque (Nm)..... :	0,25	P
	- displacement ≤ 2 mm		P
	- no movement of conductors		P
	- no damage of cable or cord		P
	- function independent of electrical connection		P
21.11 (5.2.11)	External wiring passing into luminaire		N/A
21.11 (5.2.12)	Looping-in terminals		N/A
21.11 (5.2.13)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		N/A
21.11 (5.2.14)	Mains plug same protection		P
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A
21.11 (5.2.16)	Appliance inlets (IEC 60320)		N/A
	Installation couplers (IEC 61535)		N/A
	Other appliance inlet or connector according relevant IEC standard		N/A
21.11 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
21.11 (5.2.18)	Used plug in accordance with		P
	- IEC 60083		P
	- other standard		N/A
21.11 (5.3)	**Internal wiring**		N/A
21.11 (5.3.1)	Internal wiring of suitable size and type		N/A
	Through wiring		N/A
	- not delivered/ mounting instruction		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- factory assembled		N/A
	- socket outlet loaded (A) ..... :		N/A
	- temperatures ..... :	(see Annex 2)	N/A
	Green-yellow for earth only		N/A
21.11 (5.3.1.1)	Internal wiring connected directly to fixed wiring		N/A
	Cross-sectional area (mm²)..... :		N/A
	Insulation thickness		N/A
	Extra insulation added where necessary		N/A
21.11 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		N/A
	Adequate cross-sectional area and insulation thickness		N/A
21.11 (5.3.1.3)	Double or reinforced insulation for class II		N/A
21.11 (5.3.1.4)	Conductors without insulation		N/A
21.11 (5.3.1.5)	SELV current-carrying parts		N/A
21.11 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
21.11 (5.3.2)	Sharp edges etc.		N/A
	No moving parts of switches etc.		N/A
	Joints, raising/lowering devices		N/A
	Telescopic tubes etc.		N/A
	No twisting over 360°		N/A
21.11 (5.3.3)	Insulating bushings:		N/A
	- suitable fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- cables with protective sheath		N/A
21.11 (5.3.4)	Joints and junctions effectively insulated		N/A
21.11 (5.3.5)	Strain on internal wiring		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
21.11 (5.3.6)	Wire carriers		N/A
21.11 (5.3.7)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		N/A
21.11.2 (-)	**Cables for rope lights**		**P**
	Type of cable.....:	H05RN-F	P
	Cables not lighter than IEC 60227 or IEC 60245 for class II rope lights		P
	Cables not lighter than insulation according to 5.3.1 of part 1 for class III rope lights		N/A
	Nominal cross-sectional area (mm²).....:	1,0	P
	Mechanical properties according 4.14.1 and 4.14.2 of part 1		N/A
21.11.3 (-)	**Cord anchorage test**		**P**
	Pull test 30 N 25 times on single-core cable		P
21.11.4 (-)	**Plugs and cable length**		**P**
	Splash-proof plug or permanent connection if for outdoor use		P
	Length of the cable between the plug and the connection to the rope light not less than 1,5 m		P
21.11.5 (-)	**Maximum length of extendable class II rope lights**		**P**
	Maximum length 100 m for 0,5 mm² cable		N/A
	Maximum length 150 m for 0,75 mm² cable		P

21.12 (8)	**PROTECTION AGAINST ELECTRIC SHOCK**		P
21.12 (8.2.1)	Live parts not accessible		P
	Basic insulated parts not used on the outer surface without appropriate protection		P
	Basic insulated parts not accessible with standard test finger on portable, settable and adjustable luminaires		N/A
	Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires		P
	Lamp and 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

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Clause	Requirement + Test	Result - Remark	Verdict
	Protection in any position		P
	Double-ended tungsten filament lamp		N/A
	Insulation lacquer not reliable		P
	Double-ended high pressure discharge lamp		N/A
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
21.12 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
21.12 (8.2.3.a)	Class II luminaire:		P
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A
	- basic insulation not accessible other than during starter or lamp replacement		N/A
	- glass protective shields not used as supplementary insulation		P
21.12 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N/A
21.12 (8.2.3.c)	SELV circuits with exposed current carrying parts:		N/A
	Ordinary luminaire:		N/A
	- touch current ..... :		N/A
	- no-load voltage..... :		N/A
	Other than ordinary luminaire:		N/A
	- nominal voltage ..... :		N/A
21.12 (8.2.4)	Portable luminaire have protection independent of supporting surface		N/A
21.12 (8.2.5)	Compliance with the standard test finger or relevant probe		P
21.12 (8.2.6)	Covers reliably secured		P
21.12 (8.2.7)	Discharging of capacitors $\geq$ 0,5 μF		P
	Portable plug connected luminaire with capacitor		N/A
	Other plug connected luminaire with capacitor		N/A
	Discharge device on or within capacitor		N/A
	Discharge device mounted separately		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

21.13 (12)	**ENDURANCE TEST AND THERMAL TEST**		P
21.13.1 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 21.14		P
21.13 (12.3)	Endurance test:		P
	- mounting-position ..... :	Hanging on wall per 1 meter one hook	—
	- test temperature (°C) ..... :	35	—
	- total duration (h) ..... :	240	—
	- supply voltage: Un factor; calculated voltage (V)... :	264	—
	- lamp used..... :	LED module, 240 V, 500 W	—
21.13 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		P
	- marking legible		P
	- no cracks, deformation etc.		N/A
21.13 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
21.13 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	N/A
21.13 (12.6)	Thermal test (failed lamp control gear condition):		N/A
21.13 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A) ..... :		—
	- case of abnormal conditions ..... :		—
	- electronic lamp control gear		N/A
	- measured winding temperature (°C): at 1,1 Un .... :		—
	- measured mounting surface temperature (°C) at 1,1 Un ..... :		N/A
	- calculated mounting surface temperature (°C) ..... :		N/A
	- track-mounted luminaires		N/A
21.13 (12.6.2)	Temperature sensing control		N/A
	- case of abnormal conditions ..... :		—
	- thermal link		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- manual reset cut-out		N/A
	- auto reset cut-out		N/A
	- measured mounting surface temperature (°C) ..... :		N/A
	- track-mounted luminaires		N/A
21.13 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N/A
21.13 (12.7.1)	Luminaire without temperature sensing control		N/A
21.13 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N/A
	Test method 12.7.1.1 or Annex W ..... :		—
	Test according to 12.7.1.1:		N/A
	- case of abnormal conditions ..... :		—
	- Ballast failure at supply voltage (V) ..... :		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
	Test according to Annex W:		N/A
	- case of abnormal conditions ..... :		—
	- measured winding temperature (°C): at 1,1 Un ..... :		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un ..... :		—
	- calculated temperature of fixing point/exposed part (°C) ..... :		—
	Ball-pressure test .....:	See Table 21.16 (13.2.1)	N/A
21.13 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N/A
	- case of abnormal conditions ..... :		—
	- measured winding temperature (°C): at 1,1 Un ..... :		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un ..... :		—
	- calculated temperature of fixing point/exposed part (°C) ..... :		—
	Ball-pressure test ..... :	See Table 21.16 (13.2.1)	N/A
21.13 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N/A
	- case of abnormal conditions ..... :		—
	- Components retained in place after the test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- Test with standard test finger after the test		N/A
21.13 (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 21.16 (13.2.1)	N/A
21.13.2 (-)	**Test voltage**		N/A
	Provision of 12.3.1 d) of part 1 and if class III rope lights 1,1 x rated voltage of transformer/convertor		—
	Provision of 12.4.1 d) of part 1 and if class III rope lights 1,06 x rated voltage of transformer/convertor		—
21.13.3 (-)	**Short-circuit test of rectifier**		N/A
	No emission of flames or molten material or production of flammable gases and no live parts accessible when short-circuit output of the rectifier		N/A

21.14 (9)	**RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE**		P
21.14 (-)	If IP > IP 20 the order of tests as specified in clause 21.13		—
21.14 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP..... :	IP67	—
	- mounting position during test ..... :	Fixed mounting	—
	- fixing screws tightened; torque (Nm) ..... :	—	—
	- tests according to clauses..... :	Clause 9.2.2 & Clause 9.2.8	—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		P
	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
	d) i) For luminaires without drain holes – no water entry		P
	d) ii) For luminaires with drain holes – no hazardous water entry		N/A
	e) no water in watertight luminaire		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	f) no contact with live parts (IP 2X)		P
	f) no entry into enclosure (IP 3X and IP 4X)		N/A
	f) no contact with live parts (IP3X and IP4X)		N/A
	g) no trace of water on part of lamp requiring protection from splashing water		N/A
	h) no damage of protective shield or glass envelope		N/A
21.14 (9.3)	Humidity test 48 h		P
21.15 (10)	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		P
21.15 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø ..... :		—
	Insulation resistance (MΩ) ..... :		—
	SELV		N/A
	- between current-carrying parts of different polarity :		N/A
	- between current-carrying parts and mounting surface..... :		N/A
	- between current-carrying parts and metal parts of the luminaire..... :		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :		N/A
	- Insulation bushings as described in Section 5 ..... :		N/A
	Other than SELV		P
	- between live parts of different polarity ..... :	>20 MΩ	P
	- between live parts and mounting surface ..... :	>20 MΩ	P
	- between live parts and metal parts ..... :	>20 MΩ	P
	- between live parts of different polarity through action of a switch..... :		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :		N/A
	- Insulation bushings as described in Section 5 ..... :		N/A
21.15 (10.2.2)	Electric strength test		P
	Dummy lamp		N/A
	Luminaires with ignitors after 24 h test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Luminaires with manual ignitors		N/A
	Test voltage (V) ..... :		N/A
	SELV		N/A
	- between current-carrying parts of different polarity :		N/A
	- between current-carrying parts and mounting surface ..... :		N/A
	- between current-carrying parts and metal parts of the luminaire ..... :		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts ..... :		N/A
	- Insulation bushings as described in Section 5 ..... :		N/A
	Other than SELV		P
	- between live parts of different polarity ..... :	1480 V	P
	- between live parts and mounting surface ..... :	2960 V	P
	- between live parts and metal parts ..... :	2960 V	P
	- between live parts of different polarity through action of a switch ..... :		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts ..... :		N/A
	- Insulation bushings as described in Section 5 ..... :		N/A
21.15 (10.3)	Touch current or protective conductor current (mA) :	0,01 mA	P

21.16 (13)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		P
21.16 (13.2.1)	Ball-pressure test ..... :	See Test Table 21.16 (13.2.1)	P
21.16 (13.3.1)	Needle-flame test (10 s) ..... :	See Test Table 21.16 (13.3.1)	P
21.16 (13.3.2)	Glow-wire test (650°C) ..... :	See Test Table 21.16 (13.3.2)	P
21.16 (13.4)	Proof tracking test (IEC 60112) ..... :	See Test Table 21.16 (13.4)	N/A
20.16 (-)	Flexible pipes of rope lights in compliance with IEC 60811-508		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

21.8 (11.2)	**TABLES: Creepage distances and clearances**	P
Table 11.1	**Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages**	P

RMS working voltage (V) not exceeding	50	150	250	500	750	1000
Creepage distances						
Required basic insulation, PTI ≥ 600	0,6	0,8	1,5	3	4	5,5
Measured	—	—	—	—	—	—
Required basic insulation, PTI < 600	1,2	1,6	2,5	5	8	10
Measured	—	—	2,8	—	—	—
Required supplementary insulation PTI ≥ 600	-	0,8	1,5	3	4	5,5
Measured	—	—	—	—	—	—
Required supplementary insulation PTI < 600	-	1,6	2,5	5	8	10
Measured	—	—	—	—	—	—
Required reinforced insulation	-	3,2	5	6	8	11
Measured	—	—	6,6	—	—	—
Clearances						
Required basic insulation	0,2	0,8	1,5	3	4	5,5
Measured	—	—	2,8	—	—	—
Required supplementary insulation	-	0,8	1,5	3	4	5,5
Measured	—	—	—	—	—	—
Required reinforced insulation	-	1,6	3	6	8	11
Measured	—	—	6,6	—	—	—

Table 11.2	**Minimum distances (mm) for non-sinusoidal pulse voltages**						
Rated pulse voltage (peak kV)	2,0	2,5	3,0	4,0	5,0	6,0	8,0
Required clearances	1,0	1,5	2	3	4	5,5	8
Measured							
Rated pulse voltage (peak kV)	10	12	15	20	25	30	40
Required clearances	11	14	18	25	33	40	60
Measured							
Rated pulse voltage (peak kV)	50	60	80	100	-	-	-
Required clearances	75	90	130	170	-	-	-
Measured							

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Clause	Requirement + Test	Result - Remark	Verdict

21.16 (13.2.1)	**TABLE: Ball Pressure Test of Thermoplastics**			**P**
Allowed impression diameter (mm) ..... :		<2 mm		—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
Enclosure of control gear	Blueview Elec-optic Tech Co., Ltd.	79,8	0,52	
PCB of control gear	Guangdong Yongchuangxin Electronics Co., Ltd.	125	0,99	
Supplementary information: —				

21.16 (13.3.1)	**TABLE: Needle-flame test (IEC 60695-11-5)**				P
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
PCB of control gear	Guangdong Yongchuangxin Electronics Co., Ltd.	10	No	<30	P
PCB of LED module	Blueview Elec-optic Tech Co., Ltd.	10	No	<30	P
Self-hardening compound I	Blueview Elec-optic Tech Co., Ltd.	10	No	0	P
Self-hardening compound II	Blueview Elec-optic Tech Co., Ltd.	10	No	<30	P
Supplementary information: —					

21.16 (13.3.2)	**TABLE: Glow-wire test (IEC 60695-2-11)**			
Glow wire temperature ..... :	650°C			—
Object/ Part No./ Material	Manufacturer/ trademark	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Enclosure of control gear	Blueview Elec-optic Tech Co., Ltd.	No	0	P

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Clause	Requirement + Test	Result - Remark	Verdict

Enclosure of sealed rope	Blueview Elec-optic Tech Co., Ltd.	No	0	P
Any flame or glowing of the sample extinguished within 30 s of withdrawing the glow-wire, and any burning or molten drop did not ignite the underlying parts (Yes/No) ..... :				yes
Supplementary information: —				

21.16 (13.4)	**TABLE: Proof tracking test (IEC 60112)**				**N/A**
Test voltage PTI ..... :		175 V			—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
Supplementary information:					

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX A	**Requirements for interconnecting connectors for use in rope lights**		**N/A**
	This Annex A consist relevant requirements and modifications of IEC 61984		**N/A**
5.2	**Classification according to protection against electric shock**		**N/A**
	Only enclosed connectors		**N/A**
5.3	**Classification according to the style of connector**		**N/A**
	Only free connectors		**N/A**
5.4	**Classification according to additional characteristics of connectors**		**N/A**
	According b), d), e), f), h), and j)		**N/A**
6.2.1	**Identification**		**N/A**
	According a) and b)		**N/A**
6.4.1	**Non accessibility of live parts**		**N/A**
	Test with test finger on class II rope lights		**N/A**
6.9.1	**Polarisation**		**N/A**
	Improper connection of mating parts is prevented		**N/A**
	No unsafe compatibility between connectors for class II and class III rope lights of the same manufacturer		**N/A**
	Male part of class III rope lights not make contact in the female contact of low voltage connectors (e.g. IEC 60320)		**N/A**
	Manufacturer designed connectors, no unsafe compatibility with systems according IEC 60320 and IEC 60906 and national domestic plug and socket-outlet systems in the country where the rope light is placed on the market		**N/A**
6.9.3	**Connection of conductors**		**N/A**
	Cross sectional area of the contact making part of the interconnecting coupler not less than the corresponding conductor in the interconnected cable		**N/A**
6.10	**Design of a CBC**		**N/A**
	Adequate breaking capacity		**N/A**
	Female part at the end of the rope light, other than ordinary, provided with sealing device securely fixed to the coupler		**N/A**
6.13	**Dielectric strength**		**N/A**
	Test according clause 21.15 of this standard		**N/A**
6.14.2	**Electrical endurance (CBC)**		**N/A**
	Meet the specified breaking capacity		**N/A**

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict
	Number of cycles 50		—
	Test according 7.3.5		**N/A**
6.14.3	**Bendings (non-rewirable connectors)**		**N/A**
	Meet the specified number of bendings		**N/A**
	Number of cycles 1000		—
	Test according 7.3.10		**N/A**
6.17	**Cable clamp**		**N/A**
	Test according clause 21.11.3 of this standard		**N/A**

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 1	TABLE: Critical components information					
Object / part No.	**Code**	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
LED module	B	ShenZhen Yuliang Optoelectronic Technology Co., Ltd.	YLL-T30CW-80-AJ-30-01	V_f: 2,8 V – 3,4 V; I_f: 30 mA; CCT: 6500 K -7000 K	EN 62031	Tested with appliance
Power cord	B	Guangdong Rifeng Electrical Cable Co., Ltd.	H05RN-F	2×1,0 mm^2	EN 50525-2-21	VDE
Plug	B	Ningbo Qiaopu Electric Co., Ltd.	D02-F	250 V; 16 A; IP44 Standard sheet: DIN 49406-R + DIN 49406-2-RA	DIN VDE 0620-1	VDE
PCB of LED module	B	Guangdong Yongchuangxin Electronics Co., Ltd.	YCX-2	V-0; 105 °C	EN 60598-1 EN 60598-2-21	UL & Tested with appliance
LED driver	C	Blueview Elec-optic Tech Co., Ltd.	—	—	EN 60598-1 EN 60598-2-21 EN 61347-1 EN 61347-2-13	Tested with appliance
--PCB of driver	B	Chengdu Tianmu Electronic Equipment Co., Ltd.	TM-01	V-0; 115 °C	EN 60598-1 EN 60598-2-21	UL & Tested with appliance
--Fuse	B	Conquer Electronics Co., Ltd.	MST	5 A; 300 V	EN 60598-1 EN 60598-2-21	UL & Tested with appliance
--Varistor	B	Hongzhi Lelctronics Co., Ltd.	14D471K	8/20 µs; 1200 A; 40/85/21	IEC 61051-1 IEC 61051-2 IEC 61051-2-2	VDE

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 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	**TABLE: Temperature measurements, thermal tests of Section 12**		P
	Type reference ..... :	AN2-4	—
	Lamp used..... :	LED module, 240 V, 500 W	—
	Lamp control gear used..... :	Integral LED driver	—
	Mounting position of luminaire ..... :	Fixed on wall	—
	Supply wattage (W) ..... :	540,7	—
	Supply current (A) ..... :	2,22	—
	Calculated power factor..... :	0,96	—
	Table: measured temperatures corrected for ta = 25 °C:		P
	- abnormal operating mode ..... :		—
	- test 1: rated voltage..... :		—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage ..... :	1,06 x 240 V = 254,4 V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :		—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage ..... :		—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :		—

Temperature measurements, (°C)

Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Power cord	26,1	—	43,5	—	90	—	—
PCB of control gear	26,1	—	74,5	—	115	—	—
Varistor	26,1	—	68,4	—	85	—	—
Enclosure of control gear	26,1	—	54,8	—	Ref.	—	—
End cap	26,1	—	54,3	—	Ref.	—	—
Enclosure of sealed rope	26,1	—	56,7	—	Ref.	—	—
PCB of LED module	26,1	—	64,4	—	105	—	—
LED	26,1	—	65,5	—	Ref.	—	—
Mounting surface	26,1	—	55,7	—	90	—	—
Supplementary information: —							

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 3	**Screw terminals (part of the luminaire)**		N/A
(14)	**SCREW TERMINALS**		N/A
(14.2)	Type of terminal.....:		—
	Rated current (A).....:		—
(14.3.2.1)	One or more conductors		N/A
(14.3.2.2)	Special preparation		N/A
(14.3.2.3)	Terminal size		N/A
	Cross-sectional area (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 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict

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

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict
	Terminal size and rating		N/A
15.6.2	Mechanical tests		N/A
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....:		N/A
(15.6.2.2)	Pull test pin or tab terminals (4 samples); pull (N) .....:		N/A
(15.6.3)	Electrical tests		N/A
	Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1		N/A

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

----End of main report ----

Attachment 1: Additional requirement of EN 62031: :2008 + A1: 2013 + A2: 2015			
Clause	Requirement + Test	Result - Remark	Verdict
4	**GENERAL REQUIREMENTS**		
4.4	Integral modules tested assembled in the luminaire		P
4.5	Independent modules complies with requirements in IEC 60598-1		N/A
5	**GENERAL TEST REQUIREMENTS**		
5.5	SELV-operated LED modules comply with Annex I of IEC 61347-2-13		N/A
	General conditions for tests in Annex A		N/A
6	**CLASSIFICATION**		
	Built-in module ..... :	Yes ☐ No ☒	—
	Independent module ..... :	Yes ☐ No ☒	—
	Integral module ..... :	Yes ☒ No ☐	—
	For Integral module; Note to 1.2.1 in IEC 60598-1 applies.		—
7	**MARKING**		N/A
8	**TERMINALS**		
	Screw terminals according section 14 of IEC 60598-1:		N/A
	Separately approved; component list		N/A
	Part of the luminaire		N/A
	Screwless terminals according section 15 of IEC 60598-1:		N/A
	Separately approved; component list		N/A
	Part of the luminaire		N/A
	Connectors according IEC 60838-2-2:		N/A
	Separately approved; component list		N/A
9 (9)	**PROVISION FOR PROTECTIVE EARTHING**		**N/A**
10 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		
- (10.1)	Controlgear protected against accidental contact with live parts		P
- (A2)	The current flowing between the part concerned and earth is measured and does not exceed 0,7 mA (peak) or 2 mA d.c. .....:		N/A

Attachment 1: Additional requirement of EN 62031: :2008 + A1: 2013 + A2: 2015			
Clause	Requirement + Test	Result - Remark	Verdict
- (A2)	For frequencies above 1 kHz, the current does not exceed 0,7 mA (peak) multiplied by the value of the frequency in kilohertz or 70 mA (peak) .....:		N/A
- (A3)	The voltage between the part concerned and any accessible part is measured and does not exceed 34 V (peak).....:		N/A
- (10.1)	Lacquer or enamel not used for protection or insulation		P
	Adequate mechanical strength on parts providing protection		P
- (10.2)	Capacitors > 0,5 μF: voltage after 1 min (V): < 50 V .....:		N/A
- (10.3)	Controlgear providing SELV		N/A
	Accessible conductive parts are insulated from live parts by double or reinforced insulation in SELV controlgear		N/A
	No connection between output circuit and the body or protective earthing circuit		N/A
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		N/A
	SELV outputs separated by at least basic insulation		N/A
	ELV conductive parts insulated as live parts		P
	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

Attachment 1: Additional requirement of EN 62031: :2008 + A1: 2013 + A2: 2015			
Clause	Requirement + Test	Result - Remark	Verdict

11 (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 ..... :	20 MΩ	P
	For double or reinforced insulation ≥ 4 MΩ ..... :	20 MΩ	P
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		N/A

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

13 (14)	**FAULT CONDITIONS**		
- (14)	When operated under fault conditions the controlgear:		P
	- does not emit flames or molten material		P
	- does not produce flammable gases		P
	- protection against accidental contact not impaired		P
	Thermally protected controlgear does not exceed the marked temperature value		N/A
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	P
- (14.1)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (except between live parts and accessible metal parts)		N/A
	Creepage distances on printed boards less than specified in clause 16 in Part 1 provided with coating according to IEC 60664-3		N/A

Attachment 1: Additional requirement of EN 62031: :2008 + A1: 2013 + A2: 2015			
Clause	Requirement + Test	Result - Remark	Verdict
- (14.2)	Short-circuit or interruption of semiconductor devices	(see appended table)	P
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile		N/A
- (14.4)	Short-circuit across electrolytic capacitors		N/A
- (14.5)	After the tests has been carried out on three samples:		P
	The insulation resistance ≥ 1 MΩ .....:	20 MΩ	P
	No flammable gases		P
	No accessible parts have become live		P
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P
- (14.6)	Relevant fault condition tests with high-power supply		N/A
13.2	**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

15	**CONSTRUCTION**		
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P

16 (16)	**CREEPAGE DISTANCES AND CLEARANCES**		
- (16)	Creepage and distances and clearances in compliance with IEC 61347-1	(see appended table)	P
	Insulating lining of metallic enclosures		P
	Basic insulation on printed boards tested according to clause 14		P
	Distances subjected to both sinusoidal voltage as non-sinusoidal pulses not less than value in Table 16		P
	Creepage distances not less than minimum clearance		P
16 (-)	Conductive accessible parts in compliance with applicable parts of IEC 60598-1		P

17 (17)	**SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS**	**N/A**

18 (18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**	**N/A**

Attachment 1: Additional requirement of EN 62031: :2008 + A1: 2013 + A2: 2015			
Clause	Requirement + Test	Result - Remark	Verdict
19 (19)	**RESISTANCE TO CORROSION**		
	- test according 4.18.1 of IEC 60598-1		N/A
	- adequate varnish on the outer surface		N/A
20	**INFORMATION FOR LUMINAIRE DESIGN**		
	Information in Annex D (informative)		—
21	**HEAT MANAGEMENT**		
21.1	**General**		N/A
	Exchangeability is safeguarded by cap or base		N/A
21.2	**Heat-conducting foil and paste**		N/A
	Heat-conducting foil delivered with the module if necessary		N/A
22	**PHOTOBIOLOGICAL SAFETY**		
22.1	**UV radiation**		N/A
	Luminous radiation not exceed 2mW/klm		N/A
22.2	**Blue light hazard**		**P**
	Assessed according to IEC TR 62778	RG0	P
22.3	**Infrared radiation**		N/A
	Requirements for infrared radiation when required		N/A
A	**ANNEX A - TESTS**		
	All tests performed in accordance with the advice given in Annex H of IEC 61347-1, if applicable		N/A
ANNEX 1	**SELV-operated LED modules**		**N/A**

--- End of Attachment 1 ---

Attachment 2: EN 62493			
Clause	Requirement + Test	Result - Remark	Verdict
4	LIMITS (Test summary)		
4.2.2	Lighting equipment deemed to comply with the Van der Hoofden test without testing		P
4.2.3	Unintentional radiating part of lighting equipment	factor F ≤ 1	N/A
4.3	Intentional radiating part of lighting equipment	No intentional radiating from EUT	N/A

--- End of Attachment 2 ---

Attachment 3: Photo documentation

Details of: General view AN2-4

View:

☒ general

☐ front

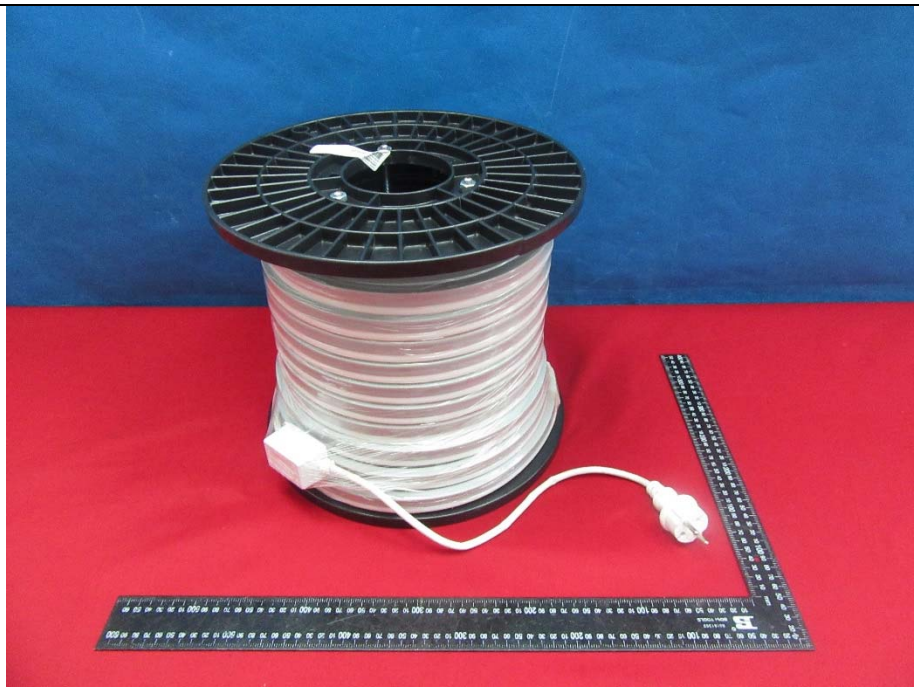
☐ rear

☐ right

☐ left

☐ top

☐ bottom



Details of: General view of driver box

View:

☒ general

☐ front

☐ rear

☐ right

☐ left

☐ top

☐ bottom

Attachment 3: Photo documentation

Details of: Details view

View:

☒ general

☐ front

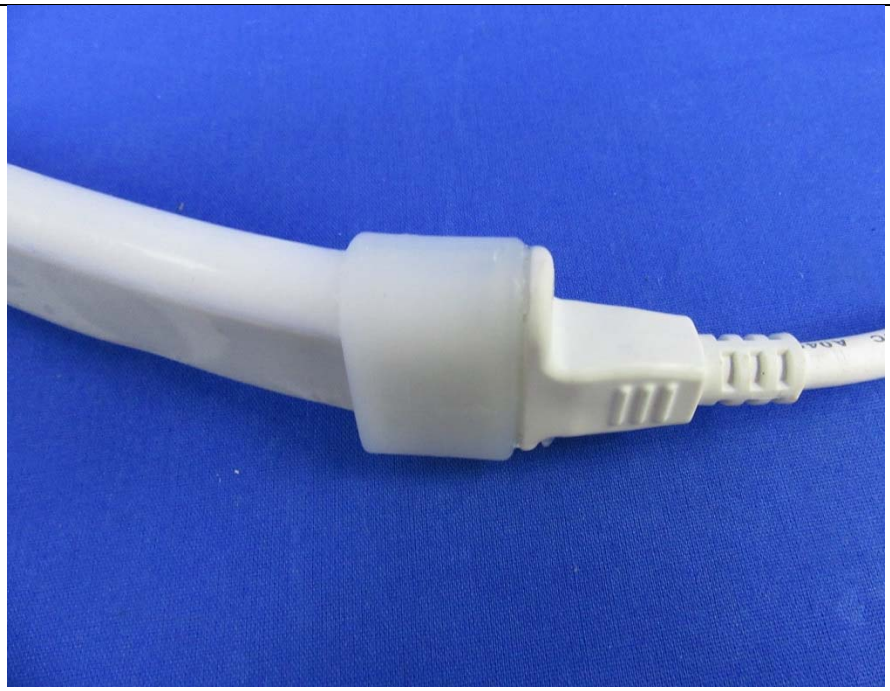
☐ rear

☐ right

☐ left

☐ top

☐ bottom



Details of: Details view

View:

☒ general

☐ front

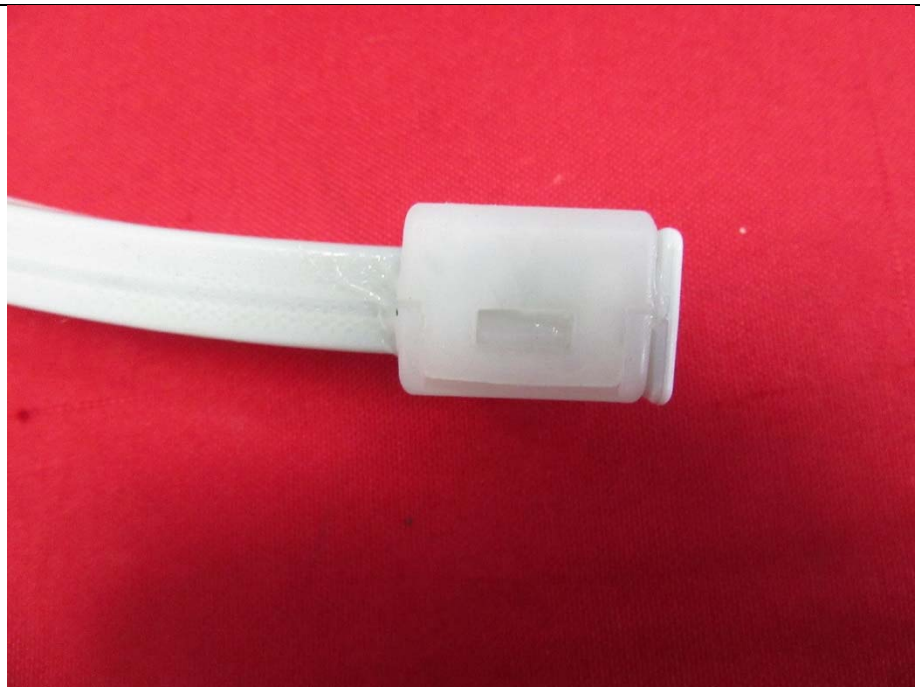
☐ rear

☐ right

☐ left

☐ top

☐ bottom



Attachment 3: Photo documentation

Details of: Internal view of driver box

View:

☒ general

☐ front

☐ rear

☐ right

☐ left

☐ top

☐ bottom

Details of: PCB of driver

View:

☒ general

☐ front

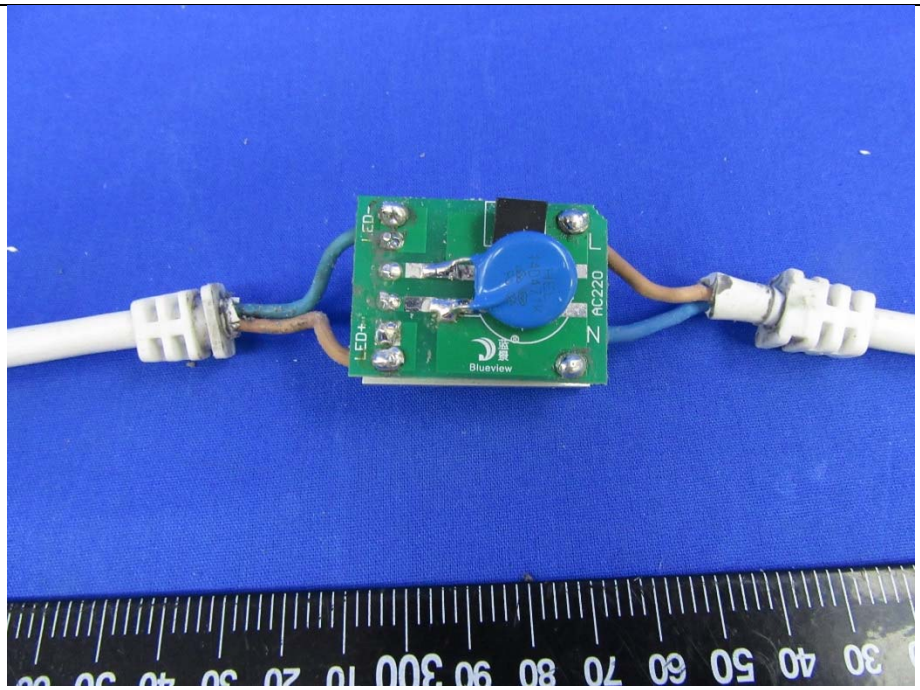
☐ rear

☐ right

☐ left

☐ top

☐ bottom



--- End of Attachment 3 ---

Attachment 4: Additional requirement of EN 61347-2-13: 2014 + A1: 2017			
Clause	Requirement + Test	Result - Remark	Verdict

4 (4)	**GENERAL REQUIREMENTS**		
- (4)	Insulation materials according requirements in Annex N of IEC 61347-1		N/A
- (4)	Compliance of independent controlgear enclosure with IEC 60 598-1		N/A
- (4)	Built-in electronic controlgear with double or reinforced insulation comply with Annex O of IEC 61347-1		P
4 (4)	SELV controlgear comply with Annex I of this part 2 and Annex L of IEC 61347-1		N/A
4 (-)	Transformer comply with IEC 61558		N/A
	Dielectric strength test of insulated winding wires is limited to 3 kV if input voltage ≤ 300 V		N/A

6 (6)	**CLASSIFICATION**		
	Built-in controlgear ..... :	Yes ☐ No ☒	—
	Independent controlgear ..... :	Yes ☐ No ☒	—
	Integral controlgear ..... :	Yes ☒ No ☐	—
6 (-)	Auto-wound controlgear ..... :	Yes ☐ No ☒	—
	Separating controlgear ..... :	Yes ☐ No ☒	—
	Isolating controlgear ..... :	Yes ☐ No ☒	—
	SELV controlgear ..... :	Yes ☐ No ☒	—

7 (7)	**MARKING**	**N/A**

8 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		
- (10.1)	Controlgear protected against accidental contact with live parts		P
- (A2)	Voltage measured with 50 kΩ		N/A
- (A3)	Voltage > 35 V peak or > 60 V d.c. or protective impendance device		N/A
- (10.1)	Lacquer or enamel not used for protection or insulation		P
	Adequate mechanical strength on parts providing protection		P
- (10.2)	Capacitors > 0,5 μF: voltage after 1 min (V): < 50 V .....:		**N/A**
- (10.3)	**Controlgear providing SELV**		**N/A**

Attachment 4: Additional requirement of EN 61347-2-13: 2014 + A1: 2017			
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		P
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		P
	SELV outputs separated by at least basic insulation		N/A
	ELV conductive parts insulated as live parts		N/A
	Tests according Annex L of IEC 61347-1	(see Annex L)	P
- (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
9 (8)	**TERMINALS**		
	Screw terminals according section 14 of IEC 60598-1:		N/A
	Separately approved; component list		N/A
	Part of the controlgear		N/A
	Screwless terminals according section 15 of IEC 60598-1:		N/A
	Separately approved; component list		N/A
	Part of the controlgear		N/A
10 (9)	**PROVISION FOR PROTECTIVE EARTHING**		**N/A**

Attachment 4: Additional requirement of EN 61347-2-13: 2014 + A1: 2017			
Clause	Requirement + Test	Result - Remark	Verdict

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

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

14 (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)		N/A

Attachment 4: Additional requirement of EN 61347-2-13: 2014 + A1: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
- (14.3)	Short-circuit or interruption of semiconductor devices		P
- (14.4)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	P
- (14.5)	Short-circuit across electrolytic capacitors		N/A
14 (-)	Reversed voltage polarity if d.c. supplied control gear	(see appended table)	P
- (14.6)	After the tests has been carried out on three samples:		P
	The insulation resistance ≥ 1 MΩ ..... :	20 MΩ	P
	No flammable gases		P
	No accessible parts have become live		P
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P
- (14.7)	Relevant fault condition tests with high-power a.c. supply		—
14 (-)	Temperature declared thermally protected lamp controlgear fulfil requirements in Annex C		N/A

15 (-)	**TRANSFORMER HEATING**		
15.1	**General**		**P**
	Transformer comply with clause L.6 and L.7 of IEC 61347-1		P
	Output voltage of SELV controlgear not exceed limits in 10.4 of IEC 61347-1 during the test of 15.1 and 15.2		N/A
15.2 (-)	**Normal operation**		**P**
	Comply with clause L.6 of IEC 61347-1		P
15.3 (-)	**Abnormal operation**		**P**
	Comply with clause L.7 of IEC 61347-1		P
	Double LED modules or equivalent load connected in parallel to the output terminals of constant voltage type		N/A
	Double LED modules or equivalent load connected in series to the output terminals of constant current type		P
15 (-)	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		**P**

Attachment 4: Additional requirement of EN 61347-2-13: 2014 + A1: 2017			
Clause	Requirement + Test	Result - Remark	Verdict

16 (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
- (15.3)	**Plugs and socket-outlets used in SELV or ELV circuits**		**N/A**
	No dangerous compatibility between output socket-outlet and a plug for socket-outlets for input circuit in relation to installation rules, voltages and frequencies		N/A
	Plugs and socket-outlets for SELV comply with IEC 60906-3 and IEC 60884-2-4		N/A
	Plugs and socket-outlets for SELV ≤ 3 A, ≤ 25 V r.m.s. or ≤ 60 V d.c. and ≤ 72 W comply with IEC 60906-3 and IEC 60884-2-4 or:		N/A
	- plugs not able to enter socket-outlets of other standardised system		N/A
	- socket-outlets not admit plugs of other standardised system		N/A
	- socket-outlets without protective earth		N/A
- (15.4)	**Insulation between circuits and accessible parts**		**N/A**
- (15.4.2)	SELV circuits		N/A
	Source used to supply SELV circuits:		N/A
	- safety isolating transformer in accordance with relevant part 2 of IEC 61558		N/A
	- controlgear providing SELV in accordance with relevant part 2 of IEC 61347		N/A
	- another source		N/A
	Voltage in the circuit not higher than ELV		N/A
	SELV circuits insulated from LV by double or reinforced insulation		N/A
	SELV circuits insulated from non SELV circuits by double or reinforced insulation		N/A
	SELV circuits insulated from FELV circuits by supplementary insulation		N/A
	SELV circuits insulated from other SELV circuits by basic insulation		N/A
	SELV circuits insulated from accessible conductive parts according Table 6 in 15.4.5		N/A

Attachment 4: Additional requirement of EN 61347-2-13: 2014 + A1: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
- (15.4.3)	FELV circuits		N/A
	Source used to supply FELV circuits:		N/A
	- separating transformer in accordance with relevant part 2 of IEC 61558		N/A
	- separating controlgear providing basic insulation between input and output circuits in accordance with relevant part 2 of IEC 61347		N/A
	- another source		N/A
	- source in circuits separated by the LV supply by basic insulation		N/A
	Voltage in the circuit not higher than ELV		N/A
	FELV circuits insulated from LV supply by at least basic insulation		N/A
	FELV circuits insulated from other FELV circuits if functional purpose		N/A
	FELV circuits insulated from accessible conductive parts according Table 6 in 15.4.5		N/A
	Plugs and socket-outlets for FELV system comply with:		N/A
	- plugs not able to enter socket-outlets of other voltage systems		N/A
	- socket-outlets not admit plugs of other voltage systems		N/A
	- socket-outlets have a protective conductor contact		N/A
- (15.4.4)	Other circuits		N/A
	Insulation between circuits other than SELV or FELV and accessible conductive parts in according Table 6 in 15.4.5.		N/A
- (15.4.5)	Insulation between circuits and accessible conductive parts		P
	Accessible conductive parts insulated from active parts of electric circuits by insulating according Table 6		P
	Requirements for Class II construction with equipotential bonding for protection against indirect contact with live parts:		N/A
	- all conductive parts are connected together		N/A
	- conductive parts are reliably connected together according test of IEC 60598-1 cl. 7.2.3		N/A
	- conductive parts comply with requirements of Annex A in case of insulation fault		N/A

17 (16)	**CREEPAGE DISTANCES AND CLEARANCES**	

Attachment 4: Additional requirement of EN 61347-2-13: 2014 + A1: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
- (16)	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	(see 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		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

18 (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)		P
(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

Attachment 4: Additional requirement of EN 61347-2-13: 2014 + A1: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
	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

19 (18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		
- (18.1)	Ball-pressure test ..... :	See Test Table 19 (18.1)	P
- (18.2)	Test of printed boards ..... :	See Test Table 19 (18.2)	N/A
- (18.3)	Glow-wire test ..... :	See Test Table 19 (18.3)	P
- (18.4)	Needle flame test ..... :	See Test Table 19 (18.4)	P
- (18.5)	Tracking test ..... :	See Test Table 19 (18.5)	N/A

20 (19)	**RESISTANCE TO CORROSION**		
	- test according 4.18.1 of IEC 60598-1		N/A
	- adequate varnish on the outer surface		N/A

21 (-)	**MAXIMUM WORKING VOLTAGE (U_{out}) IN ANY LOAD CONDITION**		
	Not exceed declared maximum working voltage U_{out} in any load condition		N/A

14	**TABLE: tests of fault conditions**	**P**
Part	**Simulated fault**	**Hazard**
BD1	Short circuit	NO
IC2	Short circuit	NO
Q1	Short circuit	NO
Output	Short circuit	NO

Attachment 4: Additional requirement of EN 61347-2-13: 2014 + A1: 2017			
Clause	Requirement + Test	Result - Remark	Verdict

17 (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	
Distance 1:	B	2,7	1,5	9	2,7	2,5	7	
Working voltage (V) ..... :					240 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: between L and N								
Distance 2:	B	2,8	1,5	9	2,8	2,5	7	
Working voltage (V) ..... :					240 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: between two end of fuse								
Distance 3:	R	>6,5	3	9	>6,5	5	7	
Working voltage (V) ..... :					240 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: between live part and enclosure								

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

19 (18.1)	TABLE: Ball Pressure Test			P
Allowed impression diameter (mm) ..... :		2		—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	

Attachment 4: Additional requirement of EN 61347-2-13: 2014 + A1: 2017			
Clause	Requirement + Test	Result - Remark	Verdict

PCB	Guangdong Yongchuangxin Electronics Co., Ltd.	125,0	0,99
Supplementary information: —			

19 (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:					

19 (18.3)	TABLE: Glow-wire test			P
Glow wire temperature..... :	650°C			—
Object/ Part No./ Material	Manufacturer/ trademark	Ignition of specified layer Yes/No	Duration of burning (s)	Verdict
PCB	Guangdong Yongchuangxin Electronics Co., Ltd.	No	0	P
Supplementary information: —				

19 (18.4)	TABLE: Needle-flame test				
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (s)	Ignition of specified layer Yes/No	Duration of burning (s)	Verdict
PCB	Guangdong Yongchuangxin Electronics Co., Ltd.	10	No	0	P
Supplementary information: —					

19 (18.5)	TABLE: Proof tracking test	N/A
Test voltage PTI ..... :	175 V	—

Attachment 4: Additional requirement of EN 61347-2-13: 2014 + A1: 2017			
Clause	Requirement + Test	Result - Remark	Verdict

Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
Supplementary information:					

Attachment 4: Additional requirement of EN 61347-2-13: 2014 + A1: 2017			
Clause	Requirement + Test	Result - Remark	Verdict
(A)	**ANNEX A - TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS A LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK**		**N/A**
(C)	**ANNEX C – PARTICULAR REQUIREMENTS FOR ELECTRONIC LAMP CONTROLGEAR WITH MEANS OF PROTECTION AGAINST OVERHEATING**		**N/A**
(D)	**ANNEX D – REQUIREMENTS FOR CARRY OUT THE HEATING TESTS OF THERMALLY PROTECTED LAMP CONTROLGEAR**		
	Tests in C7 performed in accordance with Annex D, if applicable		N/A
(F)	**ANNEX F – DRAUGHT-PROOF ENCOSURE**		
	Draught-proof enclosure in accordance with the description		P
	Dimensions of the enclosure		P
	Other design; description		N/A
(H)	**ANNEX H - TESTS**		
	All tests performed in accordance with the advice given in Annex H, if applicable		P
I (L)	**ANNEX I IN THIS PART 2 – PARTICULAR ADDITIONAL REQUIREMENTS FOR SELV D.C. OR A.C. SUPPLIED ELECTRONIC CONTROLGEARS FOR LED MODULES**		**N/A**
J (-)	**ANNEX J IN THIS PART 2 – PARTICULAR ADDITIONAL SAFETY REQUIREMENTS FOR A.C., A.C./D.C. OR D.C. SUPPLIED ELECTRONIC CONTROLGEAR FOR EMERGENCY LIGHTING**		**N/A**
(N)	**ANNEX N: REQUIREMENTS FOR INSULATION MATERIALS USED FOR DOUBLE OR REINFORCED INSULATION**		**N/A**
(O)	**ANNEX O: ADDITIONAL REQUIREMENTS FOR BUILT-IN ELECTRONIC CONTROLGEAR WITH DOUBLE OR REINFORCED INSULATION**		**N/A**
(P)	**Creepage distances and clearances and distance through isolation (DTI) for lamp controlgear which are protected against pollution by the use of coating or potting**		**N/A**

--- End of Attachment 4---