TEST REPORT

Reference No.	:	WTZ20F07049674X1L
Applicant	:	Zhongshan Songwei Lighting Electrical Co., LTD
Address	:	No. 502, Dong'an North Road, Cao Er, Guzhen Town, Zhongshan, Guangdong
Manufacturer	:	The same as above
Address	:	The same as above
Product Name	:	Bread lamp
Model No.	:	See model list on page 3.
Standards	:	Luminaires Part 2-1: Fixed general purpose luminaries EN 60598-2-1:1989 EN 60598-1:2015+A1:2018
Date of Receipt sample	:	2020-07-30
Date of Test	:	2020-08-01 to 2020-08-20
Date of Issue	:	2020-08-31
Test Report Form No.	:	WSL-6059821A-01A
Test Result	:	**Pass**

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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Test item description	:	Fixed lamps
Trade Mark	:	--
Model/Type reference	:	See model list on page 3.
Ratings	:	See model list on page 3.

Copy of marking plate:

Bread lamp
Model No.: 191244005-1
220-240VAC 50Hz
18W 4000K

Zhongshan Songwei Lighting Electrical Co;LTD

On the luminaries surface

On the LED cover

Note:
1. The marking labels for other models are identical as above, expect the model No. and rated wattage.
2. 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.
3. The marking for other models are identical except the model name and wattage.

Summary of testing:

1. All tests were performed on models 191244005-1 the tests results complied with the requirements of the standards mentioned in page one.
2. The LED driver was assessed acc. to EN 61347-2-13:2014+A1:2017 and EN 61347-1:2015, found to comply with the requirement.
3. Integral LED module was assessed according to EN 62031:2008+A1:2013+A2:2015 and found to comply with the requirement.
4. Retinal blue light hazard was assessed according to IEC/TR 62778:2014, lamp classification group: RG0 unlimited.
5. Assessment of lighting equipment related to human exposure to electromagnetic fields was evaluated and fulfilled the requirements of EN 62493:2015 and found to comply with the requirement.
6. Only the most unfavorable results are recorded in this report.

Test items particulars:

Classification of installation and use.....: Fixed

Supply Connection.....: Terminal block

Possible test case verdicts:

- test case does not apply to the test object.....: N (Not applicable)
- test object does meet the requirement.....: P (Pass)
- test object does not meet the requirement.....: F (Fail)

General remarks:

"(see remark #)" refers to a remark appended to the report.
"(see appended table)" refers to a table appended to the report.
Throughout this report a point is used as the decimal separator.

2020.08.31

This report is based on report WTZ20F07049674L for delete two models, the report WTZ20F07049674L was become invalid after issuing of this report.

General product information:

1. Fixed general purpose luminaries, for indoor use only.
2. All models have the same structure, except for rated power and 191244005-1 with switch.

Model list

Item	Model	Rated voltage (VAC)	Rated frequency (Hz)	Rated power (W)	Protection against electric shock	IP degree
1	191244005-1	220-240	50Hz	18W	Class I	IP20
2	191144001-1	220-240	50Hz	18W	Class I	IP20
3	191143001-1	220-240	50Hz	12W	Class I	IP20

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.2 (0)	**GENERAL TEST REQUIREMENTS**		**P**
1.2 (0.3)	More sections applicable.....	Yes ☐ No ☒	—
1.2 (0.5)	Components	(see Annex 1)	—
1.2 (0.7)	**Information for luminaire design in light sources standards**		—
1.2 (0.7.2)	Light source safety standard	IEC 62031	—
	Luminaire design in the light source safety standard		P
1.4 (2)	**CLASSIFICATION**		**P**
1.4 (2.2)	Type of protection (Class 0 excluded)..... :	Class I	—
1.4 (2.3)	Degree of protection (Requirement: Ordinary)..... :	IP20	—
1.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces ..... :	Yes ☒ No ☐	—
1.4 (2.5)	Luminaire for normal use ..... :	Yes ☒ No ☐	—
	Luminaire for rough service ..... :	Yes ☐ No ☒	—
1.5 (3)	**MARKING**		**P**
1.5 (3.2)	Mandatory markings	See “Copy of marking plate”	P
	Position of the marking		P
	Format of symbols/text		P
1.5 (3.3)	Additional information		P
	Language of instructions	In English	P
1.5 (3.3.1)	Combination luminaires		N
1.5 (3.3.2)	Nominal frequency in Hz	50Hz	P
1.5 (3.3.3)	Operating temperature		N
1.5 (3.3.4)	Symbol or warning notice		N
1.5 (3.3.5)	Wiring diagram		N
1.5 (3.3.6)	Special conditions		N
1.5 (3.3.7)	Metal halide lamp luminaire – warning		N
1.5 (3.3.8)	Limitation for semi-luminaires		N
1.5 (3.3.9)	Power factor and supply current		N
1.5 (3.3.10)	Suitability for use indoors		N
1.5 (3.3.11)	Luminaires with remote control		N
1.5 (3.3.12)	Clip-mounted luminaire – warning		N
1.5 (3.3.13)	Specifications of protective shields		N
1.5 (3.3.14)	Symbol for nature of supply	~	P

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.5 (3.3.15)	Rated current of socket outlet		N
1.5 (3.3.16)	Rough service luminaire		N
1.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments		N
1.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N
1.5 (3.3.19)	Protective conductor current in instruction if applicable		N
1.5 (3.3.20)	Provided with information if not intended to be mounted within arms reach		N
1.5 (3.3.21)	Non-replaceable and non-user replaceable light sources information provided	non-user replaceable	P
1.5 (3.3.22)	Controllable luminaires, classification of insulation provided		N
1.5 (3.3.23)	Luminaire without controlgear provided with necessary information for selection of appropriate component		N
1.5 (3.3.24)	If not supplied with terminal block, information on the packaging		N
1.5 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P
1.6 (4)	**CONSTRUCTION**		**P**
1.6 (4.2)	Components replaceable without difficulty		N
1.6 (4.3)	Wireways smooth and free from sharp edges		P
1.6 (4.4)	Lampholders		N
1.6 (4.4.1)	Integral lampholder		N
1.6 (4.4.2)	Wiring connection		N
1.6 (4.4.3)	Lampholder for end-to-end mounting		N
1.6 (4.4.4)	Positioning		N
	- pressure test (N) .....:	--	N
	After test the lampholder comply with relevant standard sheets and show no damage		N
	After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation		N
	- bending test (Nm) .....:		N
	After test the lampholder have not moved from its position and show no permanent deformation		N

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.4.5)	Peak pulse voltage		N
1.6 (4.4.6)	Centre contact		N
1.6 (4.4.7)	Parts in rough service luminaires resistant to tracking		N
1.6 (4.4.8)	Lamp connectors		N
1.6 (4.4.9)	Caps and bases correctly used		N
1.6 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N
1.6 (4.5)	Starter holders		N
	Starter holder in luminaires other than class II	No starter holder used	N
	Starter holder class II construction		N
1.6 (4.6)	Terminal blocks		P
	Tails		N
	Unsecured blocks		N
1.6 (4.7)	Terminals and supply connections		P
1.6 (4.7.1)	Contact to metal parts		P
1.6 (4.7.2)	Test 8 mm live conductor		P
	Test 8 mm earth conductor		P
1.6 (4.7.3)	Terminals for supply conductors		P
1.6 (4.7.3.1)	Welded connections:		N
	- stranded or solid conductor		N
	- spot welding		N
	- welding between wires		N
	- Type Z attachment		N
	- mechanical test according to 15.8.2		N
	- electrical test according to 15.9		N
	- heat test according to 15.9.2.3 and 15.9.2.4		N
1.6 (4.7.4)	Terminals other than supply connection		N
1.6 (4.7.5)	Heat-resistant wiring/sleeves		N
1.6 (4.7.6)	Multi-pole plug		N
	- test at 30 N		N
1.6 (4.8)	Switches:		P
	- adequate rating		P
	- adequate fixing		P
	- polarized supply		N

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- compliance with IEC 61058-1 for electronic switches		P
1.6 (4.9)	Insulating lining and sleeves		P
1.6 (4.9.1)	Retainement		P
	Method of fixing.....:	Heat-shrink	P
1.6 (4.9.2)	Insulated linings and sleeves		P
	Resistant to a temperature > 20 °C to the wire temperature or		P
	a) & c) Insulation resistance and electric strength		N
	b) Ageing test. Temperature (°C).....:		N
1.6 (4.10)	Insulation of Class II luminaires		P
1.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation	For Class II construction	P
	Safe installation fixed luminaires		P
	Capacitors and switches		N
	Interference suppression capacitors according to IEC 60384-14		N
1.6 (4.10.2)	Assembly gaps:		N
	- not coincidental		N
	- no straight access with test probe		N
1.6 (4.10.3)	Retainment of insulation:		P
	- fixed		P
	- unable to be replaced; luminaire inoperative		P
	- sleeves retained in position		N
	- lining in lampholder		N
1.6 (4.10.4)	Protective impedance device		N
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor		N
	Y1 or Y2 capacitors comply with IEC 60384-14		N
	Resistors comply with test (a) in 14.1 of IEC 60065		N
1.6 (4.11)	Electrical connections		P
1.6 (4.11.1)	Contact pressure		P
1.6 (4.11.2)	Screws:		N
	- self-tapping screws		N
	- thread-cutting screws		N
1.6 (4.11.3)	Screw locking:		N

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- spring washer		N
	- rivets		N
1.6 (4.11.4)	Material of current-carrying parts	> 50% Cu	P
1.6 (4.11.5)	No contact to wood or mounting surface		P
1.6 (4.11.6)	Electro-mechanical contact systems		P
1.6 (4.12)	Mechanical connections and glands		P
1.6 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N
	Torque test: torque (Nm); part.....:	Screw fixed LED board :0.5 Nm	P
	Torque test: torque (Nm); part.....:	Screw fixed Terminal block :0.5 Nm	P
1.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N
1.6 (4.12.4)	Locked connections:		N
	- fixed arms; torque (Nm).....:	--	N
	- lampholder; torque (Nm).....:	--	N
	- push-button switches; torque 0,8 Nm.....:	--	N
1.6 (4.12.5)	Screwed glands; force (Nm) .....:	--	N
1.6 (4.13)	Mechanical strength		P
1.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm).....:	--	N
	- other parts; energy (Nm).....:	All enclosure and cover: 0.35 Nm	P
	1) live parts		P
	2) linings		N
	3) protection		P
	4) covers		P
1.6 (4.13.3)	Straight test finger	All enclosure and cover: 30 N	P
1.6 (4.13.4)	Rough service luminaires		N
	- IP54 or higher		N
	a) fixed		N
	b) hand-held		N
	c) delivered with a stand		N
	d) for temporary installations and suitable for mounting on a stand		N
1.6 (4.13.6)	Tumbling barrel		N
1.6 (4.14)	Suspensions and adjusting devices		P

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.14.1)	Mechanical load:		P
	A) four times the weight		P
	B) torque 2,5 Nm		N
	C) bracket arm; bending moment (Nm) .....:	--	N
	D) load track-mounted luminaires	--	N
	E) clip-mounted luminaires, glass-shelve. Thickness (mm) .....:	--	N
	Metal rod. diameter (mm) .....:	--	N
	Fixed luminaire or independent control gear without fixing devices		N
1.6 (4.14.2)	Load to flexible cables		N
	Mass (kg) .....:	--	N
	Stress in conductors (N/mm²) .....:	--	N
	Mass (kg) of semi-luminaire .....:	--	N
	Bending moment (Nm) of semi-luminaire .....:	--	N
1.6 (4.14.3)	Adjusting devices:		N
	- flexing test; number of cycles .....:	--	N
	- strands broken	--	N
	- electric strength test afterwards		N
1.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N
1.6 (4.14.5)	Guide pulleys		N
1.6 (4.14.6)	Strain on socket-outlets		N
1.6 (4.15)	Flammable materials:		P
	- glow-wire test 650 °C	Lamp cover	P
	- spacing ≥ 30 mm		N
	- screen withstanding test of 13.3.1		N
	- screen dimensions		N
	- no fiercely burning material		P
	- thermal protection		N
	- electronic circuits exempted		N
1.6 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		N
	a) construction		N
	b) temperature sensing control		N
	c) surface temperature		N
1.6 (4.16)	Luminaires for mounting on normally flammable surfaces		P

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	No lamp control gear		N
1.6 (4.16.1)	Lamp control gear spacing:		N
	- spacing 35 mm		N
	- spacing 10 mm		N
1.6 (4.16.2)	Thermal protection:		N
	- in lamp control gear		N
	- external		N
	- fixed position		N
	- temperature marked lamp control gear		N
1.6 (4.16.3)	Design to satisfy the test of 12.6	(see 12.6)	N
1.6 (4.17)	Drain holes		N
	Clearance at least 5 mm		N
1.6 (4.18)	Resistance to corrosion:		P
1.6 (4.18.1)	- rust-resistance		N
1.6 (4.18.2)	- season cracking in copper		P
1.6 (4.18.3)	- corrosion of aluminium		N
1.6 (4.19)	Ignitors compatible with ballast		N
1.6 (4.20)	Rough service vibration		N
1.6 (4.21)	Protective shield:		N
1.6 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N
	Shield of glass if tungsten halogen lamps		N
1.6 (4.21.2)	Particles from a shattering lamp not impair safety		N
1.6 (4.21.3)	No direct path		N
1.6 (4.21.4)	Impact test on shield		N
	Glow-wire test on lamp compartment		N
1.6 (4.22)	Attachments to lamps not cause overheating or damage		N
1.6 (4.23)	Semi-luminaires comply Class II		N
1.6 (4.24)	Photobiological hazards		P
1.6 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N
1.6 (4.24.2)	Retinal blue light hazard		P
	Class of risk group assessed according to IEC/TR 62778……:	RG0 unlimited	--
	Luminaires with E_{thr}:		N
	a) Fixed luminaires		N

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- distance x m, borderline between RG1 and RG2..		N
	- marking and instruction according 3.2.23		N
	b) Portable and handheld luminaires		N
	- marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778		N
	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
1.6 (4.25)	Mechanical hazard		P
	No sharp point or edges		P
1.6 (4.26)	Short-circuit protection:		N
1.6 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N
1.6 (4.26.2)	Short-circuit test with test chain according 4.26.3		N
	Test chain not melt through		N
	Test sample not exceed values of Table 12.1 and 12.2		N
1.6 (4.27)	Terminal blocks with integrated screwless earthing contacts		N
	Test according Annex V		N
	Pull test of terminal fixing (20 N)		N
	After test, resistance < 0.05 Ω		N
	Pull test of mechanical connection (50 N)		N
	After test, resistance < 0.05 Ω		N
	Voltage drop test, resistance < 0.05 Ω		N
1.6 (4.28)	Fixing of thermal sensing control		N
	Not plug-in or easily replaceable type		N
	Reliably kept in position		N
	No adhesive fixing if UV radiations from a lamp can degrade the fixing		N
	Not outside the luminaire enclosure		N
	Test of adhesive fixing:		N
	Max. temperature on adhesive material (°C).....	--	—
	100 cycles between t min and t max		N
	Temperature sensing control still in position		N
1.6 (4.29)	Luminaires with non-replaceable light source		N
	Not possible to replace light source		N

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Live part not accessible after parts have been opened by hand or tools		N
1.6 (4.30)	Luminaires with non-user replaceable light source		P
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		P
	Minimum two fixing means		P
1.6 (4.31)	Insulation between circuits		P
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3		P
	Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfil requirements according 4.31.1 – 4.31.3		N
1.6 (4.31.1)	SELV circuits		N
	Used SELV source		N
	Voltage ≤ ELV		N
	Insulating of SELV circuits from LV supply		N
	Insulating of SELV circuits from other non SELV circuits		N
	Insulating of SELV circuits from FELV		N
	Insulating of SELV circuits from other SELV circuits		N
	SELV circuits insulated from accessible parts according Table X.1		N
	Plugs not able to enter socket-outlets of other voltage systems		N
	Socket outlets does not admit plugs of other voltage systems		N
	Plugs and socket-outlets does not have protective conductor contact		N
1.6 (4.31.2)	FELV circuits		N
	Used FELV source		N
	Voltage ≤ ELV		N
	Insulating of FELV circuits from LV supply		N
	FELV circuits insulated from accessible parts according Table X.1		N
	Plugs not able to enter socket-outlets of other voltage systems		N
	Socket outlets does not admit plugs of other voltage systems		N

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Socket-outlets does not have protective conductor contact		N
1.6 (4.31.3)	Other circuits		P
	Other circuits insulated from accessible parts according Table X.1		P
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		N
	- conductive parts are connected together		N
	- test according 7.2.3 of above		N
	- conductive part not cause an electric shock in case of an insulation fault		N
	- equipotential bonding in master/slave applications		N
	- master luminaire provided with terminal for accessible conductive parts of slave luminaires		N
	- slave luminaire constructed as class I		N
1.6 (4.32)	Overvoltage protective devices		N
	Comply with IEC 61643-11		N
	External to control gear and connected to earth:		N
	- only in fixed luminaires		N
	- only connected to protective earth		N

1.7 (11)	**CREEPAGE DISTANCES AND CLEARANCES**		**P**
1.7 (11.2.1)	Impulse withstand category (Normal category II)	Category II ☒ Category III ☐	—
	Category III according Annex U		N
	Protected against pollution, reduced creepage and clearance according Annex P of IEC 61347-1		N
1.7 (11.2.2)	Creepage distances for frequency up to 30 kHz	See Test Table 1.7 (11.2) I	P
	Creepage distances for frequency over 30 kHz:		N
	- Controlgear marked with $\hat{U}_{OUT}$ and f_{UOUT} according IEC 61347-1, clause 7.1, item w	See Test Table 1.7 (11.2) II	N
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 1.7 (11.2) II	N
1.7 (11.2.3)	Clearances for frequency up to 30 kHz	See Test Table 1.7 (11.2) I	P
	Clearances distances for frequency over 30 kHz:		N
	- Controlgear marked with U_P	See Test Table 1.7 (11.2) II	N
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 1.7 (11.2) II	N

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.8 (7)	**PROVISION FOR EARTHING**		**P**
1.8 (7.2.1 + 7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		P
	Resistance < 0,5 Ω	0.04Ω	P
	Self-tapping screws used		N
	Thread-forming screws		N
	Thread-forming screw used in a grove		N
	Earth makes contact first		N
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N
	Protective earthing of the luminaire not via built-in control gear		N
1.8 (7.2.2 + 7.2.3)	Earth continuity in joints etc.		N
1.8 (7.2.4)	Locking of clamping means		P
	Compliance with 4.7.3		P
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N
1.8 (7.2.5)	Earth terminal integral part of connector socket		N
1.8 (7.2.6)	Earth terminal adjacent to mains terminals		P
1.8 (7.2.7)	Electrolytic corrosion of the earth terminal		N
1.8 (7.2.8)	Material of earth terminal		P
	Contact surface bare metal		P
1.8 (7.2.10)	Class II luminaire for looping-in		N
	Double or reinforced insulation to functional earth		N
1.8 (7.2.11)	Earthing core coloured green-yellow		P
	Length of earth conductor		P
1.9 (14)	**SCREW TERMINALS**		**P**
	Separately approved; component list	(see Annex 1)	P
	Part of the luminaire	(see Annex 3)	N
1.9 (15)	**SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS**		**N**
	Separately approved; component list	(see Annex 1)	N
	Part of the luminaire	(see Annex 4)	N

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.10 (5)	**EXTERNAL AND INTERNAL WIRING**		**P**
1.10 (5.2)	Supply connection and external wiring		P
1.10 (5.2.1)	Means of connection.....:	Terminal block	P
	Outdoor luminaire has not PVC insulated external wiring if not class III or SELV ≤ 25 V a.c./60 V d.c. or protected from outdoor environment		N
1.10 (5.2.2)	Type of cable .....:	See annex 1	N
	Nominal cross-sectional area (mm²).....:	See annex 1	N
	Cables equal to IEC 60227 or IEC 60245		N
1.10 (5.2.3)	Type of attachment, X, Y or Z		N
1.10 (5.2.5)	Type Z not connected to screws		N
1.10 (5.2.6)	Cable entries:		N
	- suitable for introduction		N
	- adequate degree of protection		N
1.10 (5.2.7)	Cable entries through rigid material have rounded edges		N
1.10 (5.2.8)	Insulating bushings:		N
	- suitably fixed		N
	- material in bushings		N
	- material not likely to deteriorate		N
	- tubes or guards made of insulating material		N
1.10 (5.2.9)	Locking of screwed bushings		N
1.10 (5.2.10)	Cord anchorage:		N
	- covering protected from abrasion		N
	- clear how to be effective		N
	- no mechanical or thermal stress		N
	- no tying of cables into knots etc.		N
	- insulating material or lining		N
1.10 (5.2.10.1)	Cord anchorage for type X attachment:		N
	a) at least one part fixed		N
	b) types of cable		N
	c) no damaging of the cable		N
	d) whole cable can be mounted		N
	e) no touching of clamping screws		N
	f) metal screw not directly on cable		N
	g) replacement without special tool		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Glands not used as anchorage		N
	Labyrinth type anchorages		N
1.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		N
1.10 (5.2.10.3)	Tests:		N
	- impossible to push cable; unsafe		N
	- pull test: 25 times; pull (N) ..... :	--	N
	- torque test: torque (Nm) ..... :	--	N
	- displacement ≤ 2 mm		N
	- no movement of conductors		N
	- no damage of cable or cord		N
1.10 (5.2.11)	External wiring passing into luminaire		N
1.10 (5.2.12)	Looping-in terminals		N
1.10 (5.2.13)	Wire ends not tinned		N
	Wire ends tinned: no cold flow		N
1.10 (5.2.14)	Mains plug same protection		N
	Class III luminaire plug		N
1.10 (5.2.16)	Appliance inlets (IEC 60320)		N
	Appliance couplers of class II type		N
1.10 (5.2.17)	No standardized interconnecting cables properly assembled		N
1.10 (5.2.18)	Used plug in accordance with		N
	- IEC 60083		N
	- other standard		N
1.10 (5.3)	Internal wiring		P
1.10 (5.3.1)	Internal wiring of suitable size and type	(see Annex 1)	P
	Through wiring		N
	- not delivered/ mounting instruction		N
	- factory assembled		N
	- socket outlet loaded (A) ..... :	--	N
	- temperatures ..... :	--	N
	Green-yellow for earth only		P
1.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P
	Cross-sectional area (mm²) ..... :	(see Annex 1)	P
	Insulation thickness		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Extra insulation added where necessary		N
1.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		P
	Adequate cross-sectional area and insulation thickness		P
1.10 (5.3.1.3)	Double or reinforced insulation for class II		N
1.10 (5.3.1.4)	Conductors without insulation		N
1.10 (5.3.1.5)	SELV current-carrying parts		N
1.10 (5.3.1.6)	Insulation thickness other than PVC or rubber	PVC	N
1.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N
	Joints, raising/lowering devices		N
	Telescopic tubes etc.		N
	No twisting over 360°		P
1.10 (5.3.3)	Insulating bushings:		N
	- suitable fixed		N
	- material in bushings		N
	- material not likely to deteriorate		N
	- cables with protective sheath		N
1.10 (5.3.4)	Joints and junctions effectively insulated		N
1.10 (5.3.5)	Strain on internal wiring		N
1.10 (5.3.6)	Wire carriers		N
1.10 (5.3.7)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N
1.10 (5.4)	Test to determine suitability of conductors having a reduced cross-sectional area		P
	Under test the temperature of the luminaire wiring insulation not exceed the limits stated in Table 12.2	(see Annex 2)	P
	No damage to luminaire wiring after test		P

1.11 (8)	**PROTECTION AGAINST ELECTRIC SHOCK**		**P**
1.11 (8.2.1)	Live parts not accessible with standard test finger		P
	Basic insulated parts not used on the outer surface without appropriate protection		P
	Basic insulated parts not accessible with standard test finger on portable and adjustable luminaires		N
	Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Lampholder and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements		N
	Basic insulation only accessible under lamp or starter replacement		N
	Protection in any position		P
	Double-ended tungsten filament lamp		N
	Insulation lacquer not reliable		N
	Double-ended high pressure discharge lamp		N
	Relevant warning according to 3.2.18 fitted to the luminaire		N
1.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N
1.11 (8.2.3.a)	Class II luminaire:		P
	- basic insulated metal parts not accessible during starter or lamp replacement		N
	- basic insulation not accessible other than during starter or lamp replacement		P
	- glass protective shields not used as supplementary insulation		N
1.11 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N
1.11 (8.2.3.c)	SELV circuits with exposed current carrying parts:		N
	Ordinary luminaire:		N
	- voltage under load (V)	--	N
	- no-load voltage (V)	--	N
	- touch current if applicable (mA)	--	N
	One conductive part insulated if required		N
	Other than ordinary luminaire:		N
	- nominal voltage ..... :	--	N
	Class III luminaire only for connection to SELV		N
	Class III luminaire not provided with means for protective earthing		N
1.11 (8.2.4)	Portable luminaire:		N
	- protection independent of supporting surface		N
	- terminal block completely covered		N
1.11 (8.2.5)	Compliance with the standard test finger or relevant probe		P
1.11 (8.2.6)	Covers reliably secured		P

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Clause	Requirement + Test	Result - Remark	Verdict
1.11 (8.2.7)	Luminaire other than below with capacitor > 0,5 μF not exceed 50 V 1 min after disconnection		P
	Portable luminaire with capacitor > 0,1 μF (0.25) not exceed 34 V 1 s after disconnection		N
	Other luminaires with capacitor > 0,1 μF (0.25) with plug and track adaptors not exceed 60 V 5 s after disconnection		N
1.12 (12)	**ENDURANCE TEST AND THERMAL TEST**		**P**
1.12 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 1.13		—
1.12 (12.2)	Selection of lamps and ballasts		—
	Lamp used according Annex B	(Lamp used see Annex 2)	—
	Controlgear if separate and not supplied		—
1.12 (12.3)	Endurance test:		P
	a) mounting-position	Acc. to user manual	—
	b) test temperature (°C).....	35 °C	—
	c) total duration (h)	240 h	—
	d) supply voltage (V).....	1.1Un	—
	d) if not equipped with controlgear, constant voltage/current (V) or (A)	--	—
	e) luminaire ceases to operate		—
1.12 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N
	- marking legible		P
	- no cracks, deformation etc.		P
1.12 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
1.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	N
1.12 (12.6)	Thermal test (failed lamp control gear condition):		N
1.12 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A) ..... :	--	—
	- case of abnormal conditions..... :	--	—
	- electronic lamp control gear		N
	- measured winding temperature (°C): at 1,1 Un . :	--	—

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Clause	Requirement + Test	Result - Remark	Verdict
	- measured mounting surface temperature (°C) at 1,1 Un ..... :	--	N
	- calculated mounting surface temperature (°C) .. :	-	N
	- track-mounted luminaires		N
1.12 (12.6.2)	Temperature sensing control		N
	- case of abnormal conditions..... :	--	—
	- thermal link		N
	- manual reset cut-out		N
	- auto reset cut-out		N
	- measured mounting surface temperature (°C)... :	--	N
	- track-mounted luminaires		N
1.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N
1.12 (12.7.1)	Luminaire without temperature sensing control		N
1.12 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N
	Test method 12.7.1.1 or Annex V..... :	--	—
	Test according to 12.7.1.1:		N
	- case of abnormal conditions		—
	- Ballast failure at supply voltage (V) ..... :	--	—
	- Components retained in place after the test		N
	- Test with standard test finger after the test		N
	Test according to Annex V:		N
	- case of abnormal conditions		—
	- measured winding temperature (°C): at 1,1 Un.. :	--	—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un..... :	--	—
	- calculated temperature of fixing point/exposed part (°C) ..... :	--	—
	Ball-pressure test:		N
	- part tested; temperature (°C)..... :	--	N
	- part tested; temperature (°C)..... :	--	N
1.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N
	- case of abnormal conditions		—
	- measured winding temperature (°C): at 1,1 Un.. :	--	—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un..... :	--	—

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Clause	Requirement + Test	Result - Remark	Verdict
	- calculated temperature of fixing point/exposed part (°C) ..... :	--	—
	Ball-pressure test:		N
	- part tested; temperature (°C)..... :	--	N
	- part tested; temperature (°C)..... :	--	N
1.12 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N
	- case of abnormal conditions		—
	- Components retained in place after the test		N
	- Test with standard test finger after the test		N
1.12 (12.7.2)	Luminaire with temperature sensing control		N
	- thermal link	Yes ☐ No ☐	—
	- manual reset cut-out	Yes ☐ No ☐	—
	- auto reset cut-out	Yes ☐ No ☐	—
	- case of abnormal conditions		—
	- highest measured temperature of fixing point/exposed part (°C):..... :	--	—
	Ball-pressure test:.....	See Table 1.15 (13.2.1)	N

1.13 (9)	**RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE**		**P**
1.13 (-)	If IP > IP 20 the order of tests as specified in clause 1.12		P
1.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		—
	- classification according to IP ..... :	IP20	—
	- mounting position during test ..... :	Acc. to user manual	—
	- fixing screws tightened; torque (Nm)..... :	--	—
	- tests according to clauses ..... :	Cl.9.2.0	—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N
	b) no talcum in dust-tight luminaire		N
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		N
	c.1) For luminaires without drain holes – no water entry		N
	c.2) For luminaires with drain holes – no hazardous water entry		N
	d) no water in watertight or pressure watertight luminaire		N
	e) no contact with live parts (IP 2X)		P

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Clause	Requirement + Test	Result - Remark	Verdict
	e) no entry into enclosure (IP 3X and IP 4X)		N
	e) no contact with live parts through drain holes and ventilation slots (IP3X and IP4X)		N
	f) no trace of water on part of lamp requiring protection from splashing water		N
	g) no damage of protective shield or glass envelope		N
1.13 (9.3)	Humidity test 48 h	25°C, 93%R.H.	P
1.14 (10)	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		**P**
1.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø .....:	--	—
	Insulation resistance (MΩ)		—
	SELV:		N
	- between current-carrying parts of different polarity .....:	--	N
	- between current-carrying parts and mounting surface .....:	--	N
	- between current-carrying parts and metal parts of the luminaire .....:	--	N
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....:	--	N
	- Insulation bushings as described in Section 5 ..:	--	N
	Other than SELV:		P
	- between live parts of different polarity.....:	100 MΩ	P
	- between live parts and mounting surface.....:	100 MΩ	P
	- between live parts and metal parts.....:	100 MΩ	P
	- between live parts of different polarity through action of a switch .....:	--	N
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....:	--	N
	- Insulation bushings as described in Section 5 ..:	100 MΩ	P
1.14 (10.2.2)	Electric strength test		P
	Dummy lamp		N
	Luminaires with ignitors after 24 h test		N
	Luminaires with manual ignitors		N
	Test voltage (V):		P
	SELV:		N

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Clause	Requirement + Test	Result - Remark	Verdict
	- between current-carrying parts of different polarity ..... :	--	N
	- between current-carrying parts and mounting surface ..... :	--	N
	- between current-carrying parts and metal parts of the luminaire ..... :	--	N
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts ..... :	--	N
	- Insulation bushings as described in Section 5 .. :	--	N
	Other than SELV:		P
	- between live parts of different polarity..... :	1480V	P
	- between live parts and mounting surface..... :	1480V	P
	- between live parts and metal parts..... :	1480V ;2960V For Class II construction	P
	- between live parts of different polarity through action of a switch ..... :	--	N
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts ..... :	--	N
	- Insulation bushings as described in Section 5 .. :	1480V	P
1.14 (10.3)	Touch current or protective conductor current (mA)	Touch current: Max. 0.09mA, Protective conductor current: Max. 0.950mA	P

1.15 (13)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		**P**
1.15 (13.2.1)	Ball-pressure test.....	See Test Table 1.15 (13.2.1)	P
1.15 (13.3.1)	Needle-flame test (10 s)	See Test Table 1.15 (13.3.1)	P
1.15 (13.3.2)	Glow-wire test (650°C)	See Test Table 1.15 (13.3.2)	P
1.15 (13.4)	Proof tracking test (IEC 60112).....	See Test Table 1.15 (13.4)	N

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Clause	Requirement + Test	Result - Remark	Verdict

1.7 (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* and 11.2*							**P**
	Insulation type **	**Measured clearance**	**Required**		**Measured creepage**	**Required**		
			clearance	***Table**		**creepage**	***Table**	
Distance 1:	B	3.0	1.5	11.1B	3.0	2.5	11.1A	
Working voltage (V) ..... :					240VAC			—
PTI ..... :					< 600 ☒	≥ 600 ☐		—
Pulse voltage if applicable (kV) ..... :					--			—
Supplementary information: between live parts of different polarity								
Distance 2:	R	5.5	3.0	11.1B	5.5	5.0	11.1A	
Working voltage (V) ..... :					240VAC			—
PTI ..... :					< 600 ☒	≥ 600 ☐		—
Pulse voltage if applicable (kV) ..... :					--			—
Supplementary information: between live parts and mounting surface								
Distance 3:	R	5.5	3.0	11.1B	5.5	5.0	11.1A	
Working voltage (V) ..... :					240VAC			—
PTI ..... :					< 600 ☒	≥ 600 ☐		—
Pulse voltage if applicable (kV) ..... :					--			—
Supplementary information: between live parts and metal parts								

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

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Clause	Requirement + Test	Result - Remark	Verdict

1.7 (11.2)	**TABLE II: Creepage distances and clearances**							**N**
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 ☐	—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :								—
Supplementary information:								
Distance 2:								
Working voltage (V) ..... :								—
Frequency if applicable (kHz) ..... :								—
PTI ..... :					< 600 ☐		≥ 600 ☐	—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :								—
Supplementary information:								
Distance 3:								
Working voltage (V) ..... :								—
Frequency if applicable (kHz) ..... :								—
PTI ..... :					< 600 ☐		≥ 600 ☐	—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :								—
Supplementary information:								

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

1.15 (13.2.1)	**TABLE: Ball Pressure Test of Thermoplastics**		**P**
Allowed impression diameter (mm)		≤2.0	—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)
LED cover	(see Annex 1)	125	1.6
PCB of LED driver	(see Annex 1)	125	0.9
Bobbin	(see Annex 1)	125	1.1
Quick connect	(see Annex 1)	125	1.3
Supplementary information:			

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Clause	Requirement + Test	Result - Remark	Verdict

1.15 (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 LED driver	See Annex 1	10	No	0	P
Quick connect	See Annex 1	10	No	0	P
Bobbin	See Annex 1	10	No	0	P
Supplementary information:					

1.15 (13.3.2)	**TABLE: Glow-wire test (IEC 60695-2-11)**				P
Glow wire temperature	650°C				—
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test glow (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Fish paper	(see Annex 1)	30	N	0	P
LED cover	(see Annex 1)	30	N	0	P
Insulation tape	(see Annex 1)	30	N	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:					

1.15 (13.4)	**TABLE: Proof tracking test (IEC 60112)**			**N**
Test voltage PTI .....:				—
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 components					**P**
object/part No.	Code	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity
Terminal block	B	Heavy Power Co., Ltd.	PA7	450VAC; T110; 0.75-1.5mm²	EN 60998-1 EN 60998-2-1	VDE 40019839
Fish paper	B	CHANGSHU SHI LIANTANG JUEYUAN CAILIAO CHANG	6051	PI. V-0, 130°C	--	UL E236441
Lead wire to LED driver	B	DongGuan Nistar Transmitting Technology Co.Inc.	H05SJ-K	T180; 1x0.75 mm^2	VDE 0285-525-2-41	VDE 40017570
Earth wire	B	Zhongshan Dingtai Electric Co., Ltd.	H05V-K	1x0.75mm^2; 300/500V	VDE 0285-525-2-31	VDE 40048743
Switch for 191244005-1	B	Shenzhen Mairui intelligent Technology Co. LTD	MC002D6	12V~,25mA, 1E4	IEC 61058	CE
Fuse	B	Littelfuse Inc.	369	250VAC; 2A	EN 60127-1 EN 60127-3	VDE 40037351
X2 capacitor		Dongguan City Jurcc ELECTRONICS CO. LTD	MPX/MKP	275VAC; T110; 0.022μF	EN 60384-14	VDE 40034920
Bobbin	B	CHANG CHUN PLASTICS CO LTD	T375HF	150°C	--	UL E59481
Magnet Wire	B	DONG GUAN YIDA INDUSTRIAL CO LTD	xUEW(AL)/130	130°C	--	UL E344055
Insulation tape	B	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD	PZ* (b)	130°C	--	UL E165111
Quick connector	B	PINGDINGSHAN SHENMA ENGINEERING PLASTICS CO LTD	EPR27	PA66	--	UL E231964
PCB	B	INTERNATIONAL LAMINATE MATERIAL LTD	DL-C3	V-0	--	UL E134893
Heat-shrinkable tube	B	SHENZHEN WOLIDA TRADING CO LTD	RSFR-H	600VAC; 125°C	--	UL E329530
Alternative	D	DONGGUAN SALIPT CO LTD	SALIPT S-901-300	300VAC; 125°C	--	UL E209436
Lead wire to LED board	B	SHINESTATE INTERNATIONAL LTD	1007	24AWG; 80°C; 300V	--	UL E213431

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Clause	Requirement + Test	Result - Remark	Verdict

LED	C	Guangzhou Hongli Opto-Electronic Co.,Ltd	2835	IF=150mA, VF=3.0-3.2V,	IEC/TR 62778	Test with appliance
LED board	B	WODE ELECTRONICS TECHNOLOGY (ZHUHAI)CO., LTD	WD-16	Al. V-0; 130°C	--	UL E323980
LED cover	B	NAN YA PLASTICS (HUI ZHOU) CORP LTD	5410G1	PC; V-0	--	UL E235269

The codes above have the following meaning:

A - The component is replaceable with another one, also certified, with equivalent characteristics

B - The component is replaceable if authorised by the test house

C - Integrated component tested together with the appliance

D - Alternative component

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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	**Temperature measurements, thermal tests of Section 12**	**P**

ANNEX 2-1	Type reference ..... :	191244005-1	—
	Lamp used ..... :	LED 18W	—
	Lamp control gear used ..... :	Integral drive	—
	Mounting position of luminaire ..... :	Acc. to user manual	—
	Supply wattage (W) ..... :	--	—
	Supply current (A) ..... :	--	—
	Calculated power factor ..... :	--	—
	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 times rated voltage	—
	- 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
Terminal block	25.0	--	34.6	--	110	--	--
Lead wire to LED driver	25.0	--	42.7	--	180	--	--
LED driver PCB	25.0	--	68.1	--	130	--	--
Lead wire to switch	25.0	--	43.6	--	90	--	--
Switch	25.0	--	40.2	--	55	--	--
Switch ambient	25.0	--	39.7	--	55	--	--
Fuse	25.0	--	57.0	--	130	--	--
X2	25.0	--	56.2	--	110	--	--
CE1	25.0	--	78.9	--	105	--	--
Winding	25.0	--	78.1	--	130	--	--
Bobbin	25.0	--	68.6	--	150	--	--
Lead wire to LED board	25.0	--	50.3	--	80	--	--

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Clause	Requirement + Test	Result - Remark	Verdict

LED board	25.0	--	62.2	--	Ref.	--	--
LED cover	25.0	--	70.1	--	Ref.	--	--
Quick connect	25.0	--	60.5	--	Ref.	--	--
Mounting surface	25.0	--	35.4	--	90	--	--
Illuminated surface (0.1m)	25.0	--	25.3	--	90	--	--

ANNEX 3	**Screw terminals (part of the luminaire)**	**N**

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

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

ANNEX 4	**Screwless terminals (part of the luminaire)**	**N**

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

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Clause	Requirement + Test	Result - Remark	Verdict

15.6.2	Mechanical tests		N
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....:		N
(15.6.2.2)	Pull test pin or tab terminals (4 samples); pull (N) .....:		N
(15.6.3)	Electrical tests		N
	Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1		N

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

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

ANNEX 5	**National Differences for (country name) or Group Differences**	**P**
	CENELEC COMMON MODIFICATIONS (EN)	P

ATTACHMENT TO TEST REPORT IEC 60598-2-1
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES
Luminaires
Part 2: Particular Requirements:
Section One – Fixed general purpose luminaires

Differences according to.....: EN 60598-2-1:1989 used in conjunction with EN 60598-1:2015+A1:2018

Annex Form No.....: --

Annex Form Originator.....: --

Master Annex Form.....: --

ZB	**ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)**		**N**
(3.3)	DK: power supply cords of class I luminaires with label		N
(4.5.1)	DK: socket-outlets		N
(5.2.1)	CY, DK, FI, GB: type of plug		N

ZC	**ANNEX ZC, NATIONAL DEVIATIONS (EN)**		**N**
(4 & 5)	FR: Shuttered socket-outlets 10/16A		N
	FR: Safety requirements for high buildings (Arrêté du 30 décembre 2011 portant règlement de sécurité pour la construction des immeubles de grande hauteur et leur protection contre les risques d'incendie et de panique; Section VIII; Article GH 48, Eclairage) Glow-wire test for outer parts of luminaires:		N
	- 850°C for luminaires in stairways and horizontal travel paths		N
	- 650°C for indoor luminaires		N
	GB: Requirements according to United Kingdom Building Regulation		N

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
ANNEX 6	**Lamp controlgear - Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules IEC 61347-2-13:2014+A1:2016**		**P**
4 (4)	**GENERAL REQUIREMENTS**		**P**
- (4)	Insulation materials according requirements in Annex N of IEC 61347-1	(see Annex N)	N
- (4)	Compliance of independent controlgear enclosure with IEC 60 598-1		N
- (4)	Built-in electronic controlgear with double or reinforced insulation comply with Annex O of IEC 61347-1	(see Annex O)	N
4 (4)	SELV controlgear comply with Annex I of this part 2 and Annex L of IEC 61347-1	(see Annex L)	N
4 (-)	Transformer comply with IEC 61558		P
	Dielectric strength test of insulated winding wires is limited to 3 kV if input voltage ≤ 300 V		P
6 (6)	**CLASSIFICATION**		**P**
	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**
7.1 (7.1)	**Mandatory markings**		**N**
	a) mark of origin	See copy of marking plate	N
	b) model number or type reference	See copy of marking plate	N
	c) symbol for independent controlgear, if applicable		N
	d) correlation between interchangeable parts and controlgear marked		N
	e) rated supply voltage (V)		N
	supply frequency (Hz)		N
	supply current (A)	See copy of marking plate	N
	f) earthing symbol		N
	k) wiring diagram		N
	l) value of tc	See copy of marking plate	N

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Clause	Requirement + Test	Result - Remark	Verdict
	m) symbol for declared temperature		N
	t) LUM earthing symbol		N
	u) if not SELV maximum working voltage U_{out} between:		N
	- output terminals (V) .....:		N
	- output terminals and earth (V) .....:		N
7.1 (-)	Constant voltage type:	Yes ☐ No ☐	—
	- rated output power P_{rated} (W) .....:		N
	- rated output voltage U_{rated} (V) .....:		N
	Constant current type:	Yes ☐ No ☐	—
	- rated output power P_{rated} (W) .....:		N
	- rated output current I_{rated} (A) .....:		N
	Indication if for LED modules only		N
7.1 (7.2)	Marking durable and legible		N
	Rubbing 15 s water, 15 s petroleum; marking legible		N
7.2 (7.1)	**Information to be provided, if applicable**		N
	h) declaration of protection against accidental contact		N
	i) cross-section of conductors (mm²)		N
	j) number, type and wattage of lamp(s)		N
	s) SELV symbol		N
7.2 (-)	- declaration of mains connected windings		N

8 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		P
- (10.1)	Controlgear protected against accidental contact with live parts	Rely on enclosure	P
- (A2)	Voltage measured with 50 kΩ	(see Annex A)	N
- (A3)	Voltage > 35 V peak or > 60 V d.c. or protective impendance device	(see Annex A)	N
- (10.1)	Lacquer or enamel not used for protection or insulation		N
	Adequate mechanical strength on parts providing protection		P
- (10.2)	Capacitors > 0,5 μF: voltage after 1 min (V): < 50 V .....:	Max. 12V	P
- (10.3)	**Controlgear providing SELV**		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Accessible conductive parts are insulated from live parts by double or reinforced insulation in SELV controlgear		N
	No connection between output circuit and the body or protective earthing circuit		N
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		N
	SELV outputs separated by at least basic insulation		N
	ELV conductive parts insulated as live parts		N
	Tests according Annex L of IEC 61347-1	(see Annex L)	N
- (10.4)	**Accessible conductive parts in SELV circuits**		N
	Output voltage under load ≤ 25 V r.m.s. or ≤ 60 V d.c.		N
	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
	One conductive part is insulated if output voltage or current exceeding the values above and withstand test voltage 500 V		N
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor		N
	Y1 or Y2 capacitors comply with IEC 60384-14		N
	Resistors comply with test (a) in 14.1 of IEC 60065		N
9 (8)	**TERMINALS**		**N**
	Screw terminals according section 14 of IEC 60598-1:		N
	Separately approved; component list	(see Annex 1)	N
	Part of the controlgear	(see Annex 2)	N
	Screwless terminals according section 15 of IEC 60598-1:		N
	Separately approved; component list	(see Annex 1)	N
	Part of the controlgear	(see Annex 3)	N
10 (9)	**PROVISION FOR PROTECTIVE EARTHING**		**N**
- (9.1)	Provisions for protective earthing		N
	Terminal complying with clause 8		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Locked against loosening and not possible to loosen by hand		N
	Not possible to loosen clamping means unintentionally on screwless terminals		N
	All parts of material minimizing the danger of electrolytic corrosion		N
	Made of brass or equivalent material		N
	Contact surface bare metal		N
	Test according 7.2.3 of IEC 60598-1		N
- (9.2)	Provision for functional earthing		N
	Comply with clause 8 and 9.1		N
	Functional earth insulated from live parts by double or reinforced insulation		N
- (9.3)	Lamp controlgear with conductors for protective earthing by tracks on printed circuit board		N
	Test with a current of 25 A between earthing terminal or earthing contact 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
- (9.4)	Earthing of built-in lamp controlgear		N
	Earth by means of fixing to earthed metal of luminaire in compliance of 7.2 of IEC 60598-1		N
	Earthing terminal only for earthing the built-in controlgear		N
- (9.5)	Earthing via independent controlgear		N
- (9.5.1)	Earth connection to other equipment		N
	Looping or through connection, conductor min. 1,5 mm² and of copper or equivalent		N
	Protective earthing wires in line with 5.3.1.1 and clause 7 of IEC 60598-1		N
- (9.5.2)	Earthing of the lamp compartments powered via the independent lamp controlgear		N
	Test with a current of 25 A between input and output earth terminals; measured resistance (Ω) between earthing terminal or earthing contact and each of the accessible metal parts at ≥ 10 A according 7.2.3 of IEC 60598-1: < 0,5 Ω ..... :		N
	Output earthing terminal marked as in 7.1 t) of IEC 61347-1		N
11 (11)	**MOISTURE RESISTANCE AND INSULATION**		**P**

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
- (11)	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance:		P
	For basic insulation ≥ 2 MΩ ..... :	> 100 MΩ	P
	For double or reinforced insulation ≥ 4 MΩ ..... :	--	N
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		N
12 (12)	**ELECTRIC STRENGTH**		**P**
- (12)	Immediately after clause 11 electric strength test for 1 min		P
	Basic insulation for SELV, test voltage 500 V		N
	Working voltage ≤ 50 V, test voltage 500 V		N
	Working voltage > 50 V ≤ 1000 V, test voltage (V):		P
	Basic insulation, 2U + 1000 V	Between L & N (remove fuse): 1480V (Working voltage: 240V)	P
	Supplementary insulation, 2U + 1000 V		N
	Double or reinforced insulation, 4U + 2000 V		N
	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
14 (14)	**FAULT CONDITIONS**		**P**
- (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
	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
- (14.3)	Short-circuit or interruption of semiconductor devices	(see appended table)	P

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Clause	Requirement + Test	Result - Remark	Verdict
- (14.4)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	N
- (14.5)	Short-circuit across electrolytic capacitors	(see appended table)	P
14 (-)	Reversed voltage polarity if d.c. supplied control gear	(see appended table)	N
- (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		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
15 (-)	**TRANSFORMER HEATING**		**P**
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
15.2 (-)	Normal operation		P
	Comply with clause L.6 of IEC 61347-1		N
15.3 (-)	Abnormal operation		P
	Comply with clause L.7 of IEC 61347-1		N
	Double LED modules or equivalent load connected in parallel to the output terminals of constant voltage type		N
	Double LED modules or equivalent load connected in parallel 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
16 (15)	**CONSTRUCTION**		**P**
- (15.1)	Wood, cotton, silk, paper and similar fibrous material		P
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
- (15.2)	Printed circuits		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Printed circuits used as internal connections complies with clause 14		P
- (15.3)	Plugs and socket-outlets used in SELV or ELV circuits		N
	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
	Plugs and socket-outlets for SELV comply with IEC 60906-3 and IEC 60884-2-4		N
	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
	- plugs not able to enter socket-outlets of other standardised system		N
	- socket-outlets not admit plugs of other standardised system		N
	- socket-outlets without protective earth		N
- (15.4)	Insulation between circuits and accessible parts		N
- (15.4.2)	SELV circuits		N
	Source used to supply SELV circuits:		N
	- safety isolating transformer in accordance with relevant part 2 of IEC 61558		N
	- controlgear providing SELV in accordance with relevant part 2 of IEC 61347		N
	- another source		N
	Voltage in the circuit not higher than ELV		N
	SELV circuits insulated from LV by double or reinforced insulation		N
	SELV circuits insulated from non SELV circuits by double or reinforced insulation		N
	SELV circuits insulated from FELV circuits by supplementary insulation		N
	SELV circuits insulated from other SELV circuits by basic insulation		N
	SELV circuits insulated from accessible conductive parts according Table 6 in 15.4.5		N
- (15.4.3)	FELV circuits		N
	Source used to supply FELV circuits:		N
	- separating transformer in accordance with relevant part 2 of IEC 61558		N

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Clause	Requirement + Test	Result - Remark	Verdict
	- separating controlgear providing basic insulation between input and output circuits in accordance with relevant part 2 of IEC 61347		N
	- another source		N
	- source in circuits separated by the LV supply by basic insulation		N
	Voltage in the circuit not higher than ELV		N
	FELV circuits insulated from LV supply by at least basic insulation		N
	FELV circuits insulated from other FELV circuits if functional purpose		N
	FELV circuits insulated from accessible conductive parts according Table 6 in 15.4.5		N
	Plugs and socket-outlets for FELV system comply with:		N
	- plugs not able to enter socket-outlets of other voltage systems		N
	- socket-outlets not admit plugs of other voltage systems		N
	- socket-outlets have a protective conductor contact		N
- (15.4.4)	Other circuits		P
	Insulation between circuits other than SELV or FELV and accessible conductive parts in according Table 6 in 15.4.5.		P
- (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:		P
	- all conductive parts are connected together		N
	- conductive parts are reliably connected together according test of IEC 60598-1 cl. 7.2.3		N
	- conductive parts comply with requirements of Annex A in case of insulation fault		N
17 (16)	**CREEPAGE DISTANCES AND CLEARANCES**		**P**
- (16)	Creepage distances and clearances according to 16.2 and 16.3		P
	Controlgears providing SELV comply with additional requirements in Annex L		N
	Insulating lining of metallic enclosures		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Controlgear protected against pollution comply with Annex P	(see Annex P)	N
- (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
	Creepage distances according to Table 8	(see appended table)	N
- (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
	Clearances distances for basic or supplementary insulation according to Table 10	(see appended table)	N
	Clearances distances for reinforced insulation according to Table 11	(see appended table)	N
18 (17)	**SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS**		**P**
	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		N
(4.11.2)	Screws:		N
	- self-tapping screws		N
	- thread-cutting screws		N
(4.11.3)	Screw locking:		N
	- spring washer		N
	- rivets		N
(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		P
(4.12)	Mechanical connections and glands		N
(4.12.1)	Screws not made of soft metal		N
	Screws of insulating material		N
	Torque test: torque (Nm); part.....:		N
	Torque test: torque (Nm); part.....:	--	N
	Torque test: torque (Nm); part.....:	--	N
(4.12.2)	Screws with diameter < 3 mm screwed into metal	--	N

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
(4.12.4)	Locked connections:		N
	- fixed arms; torque (Nm) ..... :	--	N
	- lampholder; torque (Nm) ..... :	--	N
	- push-button switches; torque 0,8 Nm ..... :	--	N
(4.12.5)	Screwed glands; force (Nm)..... :	--	N
19 (18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		**P**
- (18.1)	Ball-pressure test ..... :	See Test Table 19 (18.1)	P
- (18.2)	Test of printed boards ..... :	See Test Table 19 (18.2)	P
- (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
20 (19)	**RESISTANCE TO CORROSION**		**N**
	- test according 4.18.1 of IEC 60598-1		N
	- adequate varnish on the outer surface		N
21 (-)	**MAXIMUM WORKING VOLTAGE (Uout) IN ANY LOAD CONDITION**		**P**
	Not exceed declared maximum working voltage Uout in any load condition		P
14	**TABLE: tests of fault conditions**		**P**
LED driver			
Part	Simulated fault		Hazard
IC1	Short circuit		~~YES~~/NO
D1	Short circuit		~~YES~~/NO
D2	Short circuit		~~YES~~/NO
C3	Short circuit		~~YES~~/NO
Output	Short circuit		~~YES~~/NO

IEC 61347-2-13			
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	3.0	1.5	9	3.0	2.5	7	
Working voltage (V)					240			—
Frequency if applicable (kHz)					--			—
PTI					< 600 ☒ > 600 ☐			—
Peak value of the working voltage Ûout if applicable (kV)					--			—
Pulse voltage if applicable (kV)					--			—
Supplementary information: between opposite polarity of live parts(L and N, Two pins of fuse on PCB)								

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

19 (18.1)	**TABLE: Ball Pressure Test**			**P**
Allowed impression diameter (mm) ..... :		≤2,0		—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
See table 1.15 (13.2.1)				
Supplementary information:				

19 (18.2)	**TABLE: Test of printed boards**				**P**
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 of LED driver	See Annex 1	30	No	6	P
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
See table 1.15 (13.3.2)				
Supplementary information:				

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

19 (18.4)	**TABLE: Needle-flame test**				**P**
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (s)	Ignition of specified layer Yes/No	Duration of burning (s)	Verdict
See table 1.15 (13.3.1)					
Supplementary information:					

19 (18.5)	**TABLE: Proof tracking test**		**N**
Test voltage PTI ..... :		--	—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens	Verdict
See table 1.15 (13.4)			
Supplementary information:			

(A)	**ANNEX A - TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS A LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK**		**N**
(A.1)	Comply with A.2 or A.3		N
(A.2)	Voltage ≤ 35 V peak or ≤ 60 V d.c ..... :	--	N
(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
	Comply with Annex G.2 of IEC 60598-1		N

(C)	**ANNEX C – PARTICULAR REQUIREMENTS FOR ELECTRONIC LAMP CONTROLGEAR WITH MEANS OF PROTECTION AGAINST OVERHEATING**		**N**
(C3)	GENERAL REQUIREMENTS		N
(C3.1)	Thermal protection means integral with the convertor, protected against mechanical damage		N
	Renewable only by means of a tool		N
	If function depending on polarity, for cord-connected equipment protection means in both leads		N
	Thermal links comply with IEC 60691		N
	Electrical controls comply with IEC 60730-2-3		N
(C3.2)	No risk of fire by breaking (clause C7)		N
(C5)	CLASSIFICATION		N
	a) automatic resetting type		—
	b) manual resetting type		—

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	c) non-renewable, non-resetting type		—
	d) renewable, non-resetting type		—
	e) other type of thermal protection; description ....:		—
(C6)	MARKING		N
(C6.1)	Symbol for temperature declared thermally protected ballasts		N
(C6.2)	Declaration of the type of protection provided		N
(C7)	LIMITATION OF HEATING		N
(C7.1)	Preselection test:		N
	Test sample placed for at least 12 h in an oven having temperature (tc - 5) K		N
	No operation of the protection device		N
(C7.2)	Functioning of protection means:		N
	Normal operation of the sample in a test enclosure according to Annex D at an ambient temperature such that (tc +0; -5) °C is obtained		N
	No operation of the protection device		N
	Introducing of the most onerous test condition determined during test of clause 14.2 to 14.5		N
	Output of windings connected to the mains supply short-circuited, and other part of the controlgear operated under normal conditions		N
	Increasing of the current through the windings continuously until operation of the protection means		N
	Continuous measuring of the highest surface temperature		N
	Ballasts according to C5 a) or C5 e) operated until stable conditions are achieved		N
	Automatic-resetting thermal protectors working 3 times		N
	Ballasts according to C5 b) working 6 times		N
	Ballasts according to C5 c) and C5) d) working once		N
	Highest temperature does not exceed the marked value		N
	Any overshoot of 10% over the marked value within 15 min		N
	After 15 min value not exceed marked value		N
(D)	**ANNEX D – REQUIREMENTS FOR CARRY OUT THE HEATING TESTS OF THERMALLY PROTECTED LAMP CONTROLGEAR**		**N**

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Tests in C7 performed in accordance with Annex D, if applicable		N
(F)	**ANNEX F – DRAUGHT-PROOF ENCOSURE**		**P**
	Draught-proof enclosure in accordance with the description		P
	Dimensions of the enclosure		P
	Other design; description		N
(H)	**ANNEX H - TESTS**		**P**
	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
	Requirements not applicable to the evaluated product		—
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
	Requirements not applicable to the evaluated product		—
(N)	ANNEX N: REQUIREMENTS FOR INSULATION MATERIALS USED FOR DOUBLE OR REINFORCED INSULATION		N
	Requirements not applicable to the evaluated product		—
(O)	**ANNEX O: ADDITIONAL REQUIREMENTS FOR BUILT-IN ELECTRONIC CONTROLGEAR WITH DOUBLE OR REINFORCED INSULATION**		N
	Requirements not applicable to the evaluated product		—
(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
	Requirements not applicable to the evaluated product		—

ATTACHMENT TO TEST REPORT IEC 61347-2-13
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES

Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules

Differences according to.....: EN 61347-2-13:2014+A1:2017 used in conjunction with EN 61347-1:2015

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

	CENELEC COMMON MODIFICATIONS (EN)	P
	No Common modifications	P

EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict
ANNEX 7	**LED modules for general lighting – Safety specifications EN 62031:2008+A1:2013+A2:2015**		**P**
4	**GENERAL REQUIREMENTS**		P
4.4	Integral modules treated as part of luminaires defined in clause 0.5 of IEC 60598-1		P
4.5	Independent modules complies with requirements in IEC 60598-1		N
5	**GENERAL TEST REQUIREMENTS**		—
5.5	SELV-operated LED modules comply with Annex I of IEC 61347-2-13	(see Annex 1)	N
	General conditions for tests in Annex A	(see Annex A)	N
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**
	Requirements not applicable to the evaluated product.		—
8	**TERMINALS**		**N**
	Screw terminals according section 14 of IEC 60598-1:		N
	Separately approved; component list	(see Annex 2)	N
	Part of the luminaire	(see Annex 3)	N
	Screwless terminals according section 15 of IEC 60598-1:		N
	Separately approved; component list	(see Annex 2)	N
	Part of the luminaire	(see Annex 4)	N
	Connectors according IEC 60838-2-2:		N
	Separately approved; component list	(see Annex 2)	N
9 (9)	**PROVISION FOR PROTECTIVE EARTHING**		**N**
	Requirements not applicable to the evaluated product.		—

EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict
10 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		**N**
	Requirements not applicable to the evaluated product.		—
11 (11)	**MOISTURE RESISTANCE AND INSULATION**		**P**
	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance with d.c. 500 V (MΩ):		P
	For basic insulation ≥ 2 MΩ .....:	100MΩ	P
	For double or reinforced insulation ≥ 4 MΩ .....:	--	N
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		N
12 (12)	**ELECTRIC STRENGTH**		**P**
	Immediately after clause 11 electric strength test for 1 min		P
	Basic insulation for SELV, test voltage 500 V		N
	Working voltage ≤ 50 V, test voltage 500 V		N
	Working voltage > 50 V ≤ 1000 V, test voltage (V):		P
	Basic insulation, 2U + 1000 V		P
	Supplementary insulation, 2U + 1000 V		N
	Double or reinforced insulation, 4U + 2000 V		N
	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
13 (14)	**FAULT CONDITIONS**		**P**
- (14)	When operated under fault conditions the controlgear:		P
	- does not emit flames or molten material		P
	- does not produce flammable gases		P
	- protection against accidental contact not impaired		P
	Thermally protected controlgear does not exceed the marked temperature value		N
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	N

EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict
- (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)		P
	Creepage distances on printed boards less than specified in clause 16 in Part 1 provided with coating according to IEC 60664-3		N
- (14.2)	Short-circuit or interruption of semiconductor devices	LED	P
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	N
- (14.4)	Short-circuit across electrolytic capacitors	(see appended table)	N
- (14.5)	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		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		—
13.2	Module withstands overpower condition >15 min.		P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		N
	During the tests, tissue paper, spread below module, does not ignite		P
15	**CONSTRUCTION**		**P**
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
16	**CREEPAGE DISTANCES AND CLEARANCES**		**P**
	Creepage and distances and clearances in compliance with IEC 60598-1		P
17 (17)	**SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS**		**P**
	Screws, current-carrying parts and connections in compliance with IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1)		P
18 (18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		**N**
	Resistance to Heat, Fire and Tracking in compliance with IEC 61347-1 (clause numbers between parentheses refer to IEC 61347-1)		N
(18.1)	Ball-pressure test:		N

EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict
	- part tested; temperature (°C)..... :	--	N
(18.2)	Test of printed boards		N
	- part tested..... :	--	N
(18.3)	Glow-wire test (650°C):		P
	- part tested..... :	See Test Table 4.15 (13.3.2)	P
(18.4)	Needle flame test (10 s):		P
	- part tested..... :	See Test Table 4.15 (13.4)	P
(18.5)	Tracking test:		N
	- part tested..... :	--	N
19 (19)	**RESISTANCE TO CORROSION**		**N**
	Rust protection:		N
	- test according 4.18.1 of IEC 60598-1		N
	- adequate varnish on the outer surface		N
20	**INFORMATION FOR LUMINAIRE DESIGN**		**N**
	Information in Annex D		—
21	**HEAT MANAGEMENT**		**N**
21.1	General		N
	Exchangeability is safeguarded by cap or base		N
21.2	Heat-conducting foil and paste		N
	Heat-conducting foil delivered with the module if necessary		N
21.4	Construction		N
	Electrical connection and mechanical holding are separate		N
22	**Photobiological safety**		**P**
22.1	UV radiation		N
22.2	Blue light hazard		P
	RG at 200 mm according to IEC/TR 62778	RG0 Unlimited	P
22.3	Infrared radiation		N

EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict
A	**ANNEX A - TESTS**		**P**
	All tests performed in accordance with the advice given in Annex H of IEC 61347-1, if applicable		P

	ANNEX 1 - SELV-operated LED modules	**N**
	SELV-operated LED modules in compliance with Annex I of IEC 61347-2-13	N

IEC 62778			
Clause	Requirement + Test	Result - Remark	Verdict

Annex 8	**Retinal blue light hazard Of Lamps And Lamp Systems IEC TR 62778:2014**	**P**

	TABLE: Spectroradiometric measurement		**P**
	Measurement performed on:	☐ **LED package** ☐ **LED module** ☒ **Lamp** ☐ **Luminaire**	—
	Model number.....:	191244005-1	—
	Test voltage (V) .....:	240V	—
	Test current (mA) .....:	--	—
	Test frequency (Hz).....:	--	—
	Ambient, t (°C) .....:	25.3	—
	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	6381	—
x/y colour coordinates	---	---	0.3140/0.3377	—
Blue light hazard radiance	L_B	$W/(m^2 \cdot sr^1)$	7.340e+000	—
Blue light hazard irradiance	E_B	W/m^2	2.198e+000	—
Luminance	L	cd/m^2	9.104e+003	—
Illuminance	E	lx	6567	—
Lamp classification group: RG0 Unlimited				

EN 62493			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 9	**Assessment Of Lighting Equipment Related To Human Exposure To Electromagnetic Fields according to standard EN 62493:2015**	**P**

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

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

7	**ASSESSMENT PROCEDURE INTENTIONAL RADIATORS**		**N**
7.2	**Low-power exclusion method**		**N**
7.2.1	Input $P_{int,rad}$		—
	Exclusion level P_{max}		—
	Input power $P_{int,rad}$ < exclusion level P_{max}		N
7.3	**Application of the EMF product standard for body worn-equipment**		N

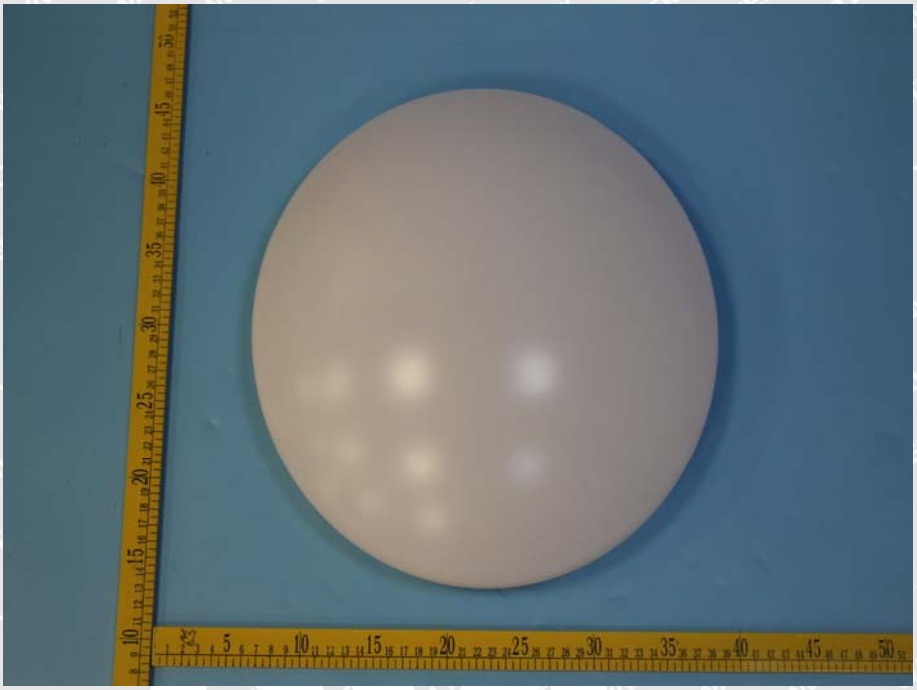
EN 62493			
Clause	Requirement + Test	Result - Remark	Verdict
	If not Clause 7.2 is met and expose distance ≤ 0.05 m, comply with IEC 62209-2		N
7.4	**Application of the EMF product standard for base stations**		N
	If not Clause 7.2 is met and if intentional radiator is base station, comply with IEC 62232		N
7.5	**Application of another EMF standard**		N
	If not Clause 7.2 is met and if intentional radiator cannot be considered as in Clause 7.3 or 7.4, comply with IEC 62311		N

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

====== End of Report ======

Photo Documentation

Model: 191244005-1



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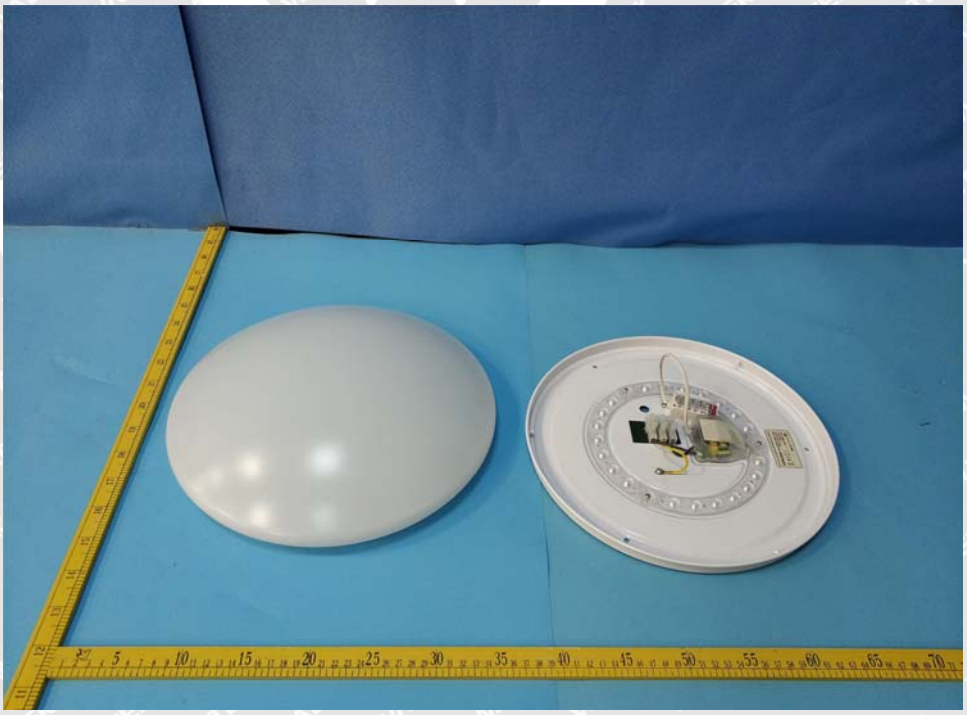


Photo 2

Photo Documentation

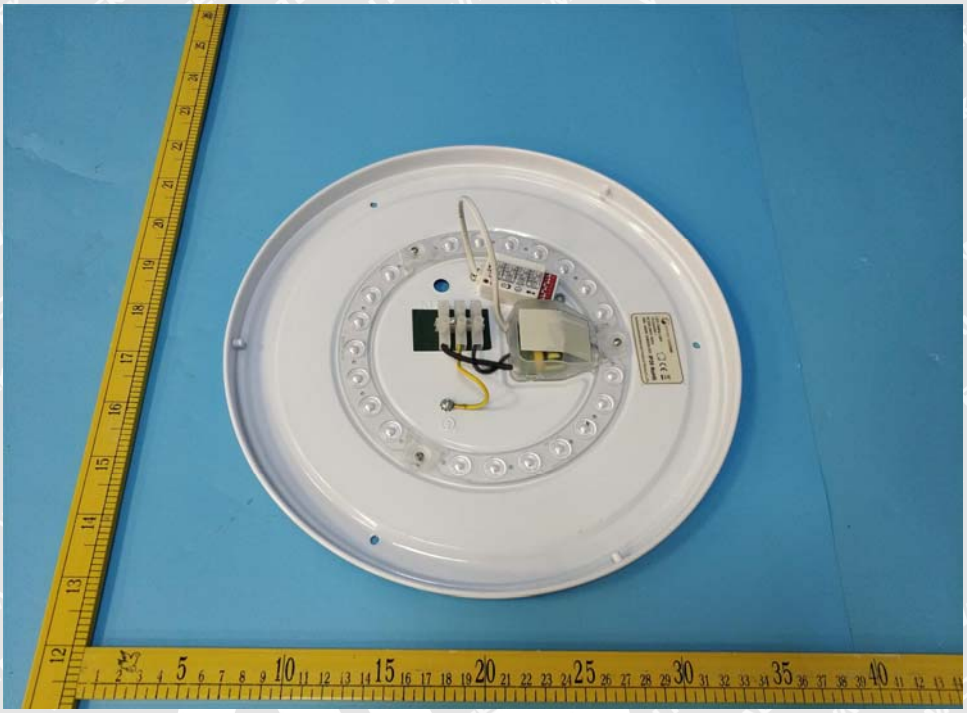
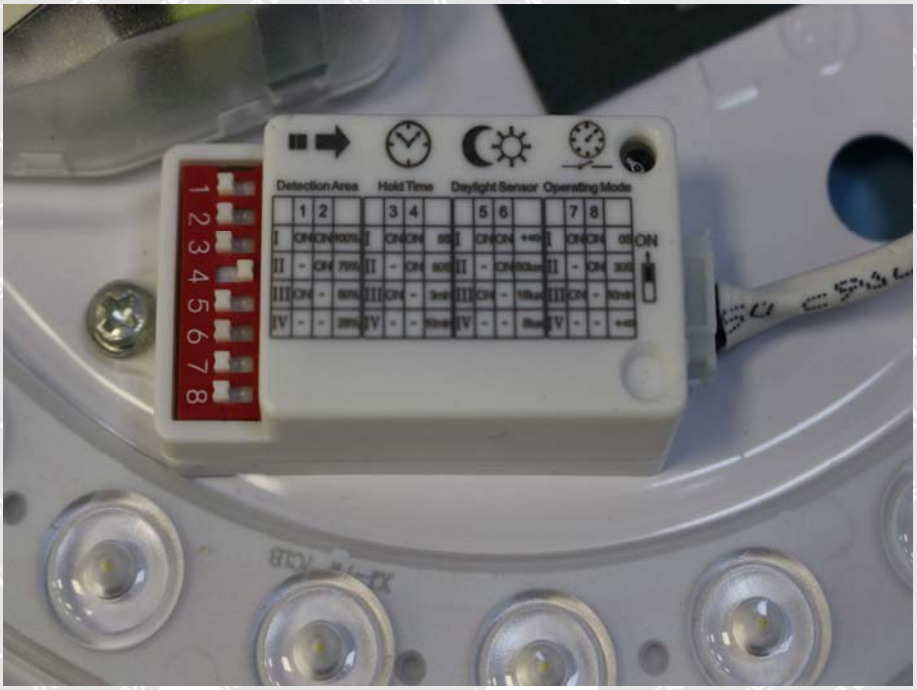


Photo 3

Photo 4

Photo Documentation



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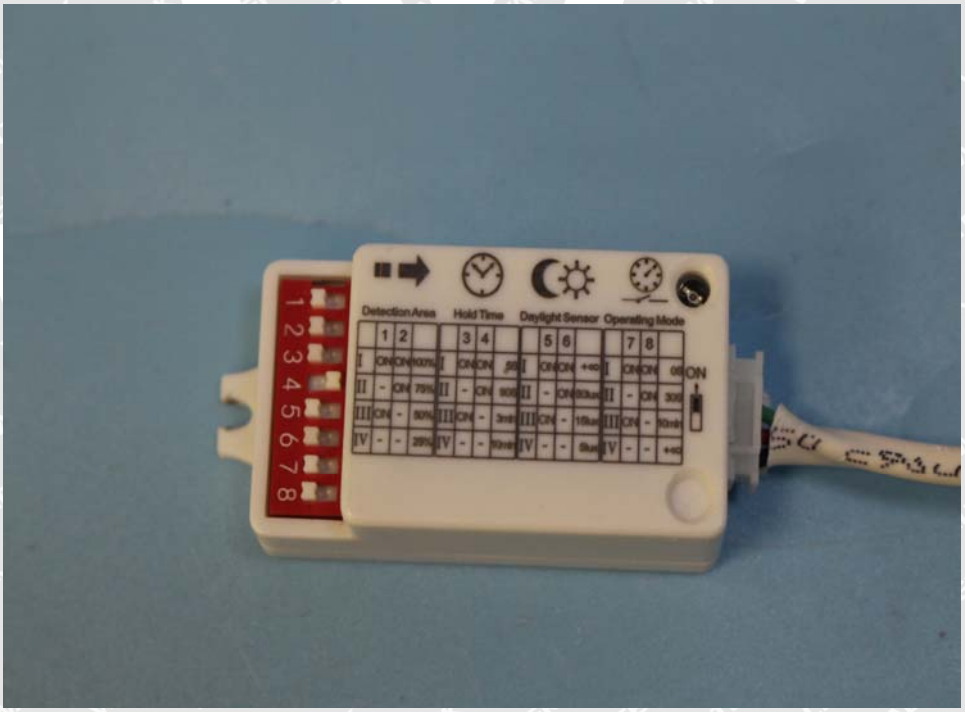


Photo 6

Photo Documentation

Photo 7

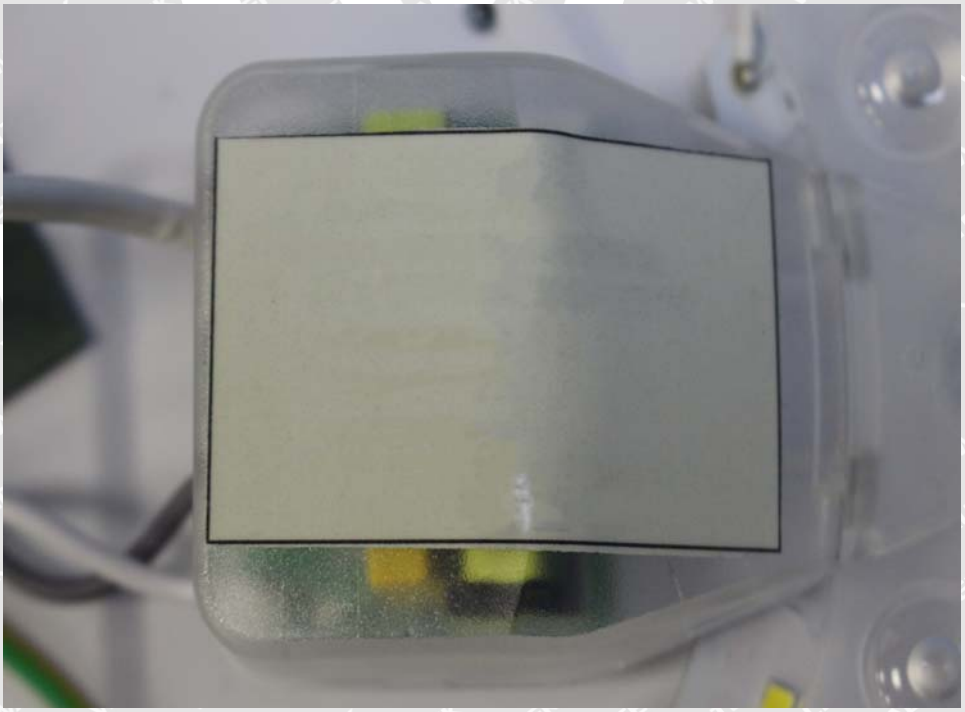
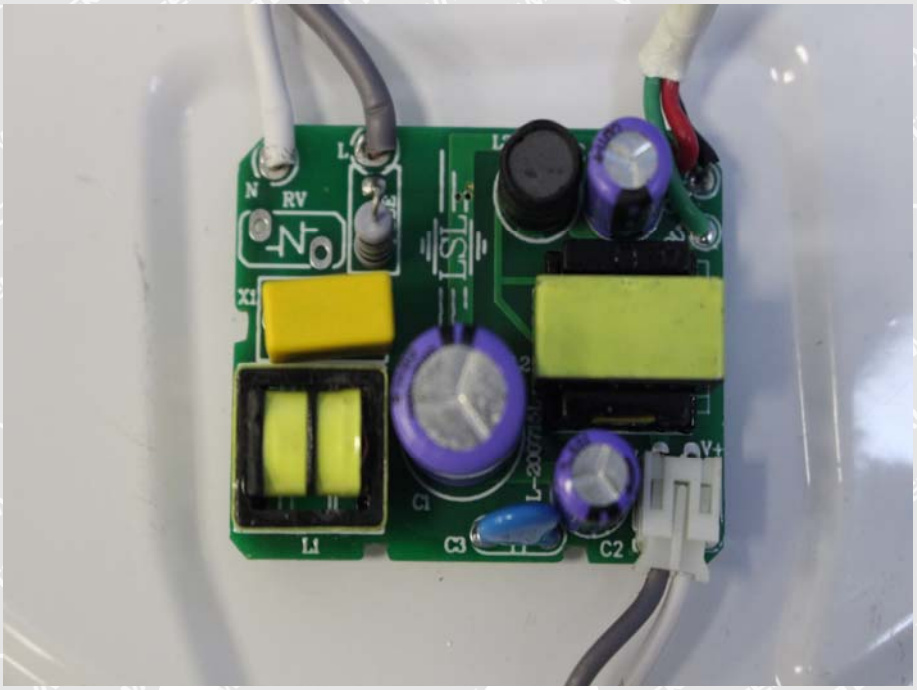


Photo 8

Photo Documentation



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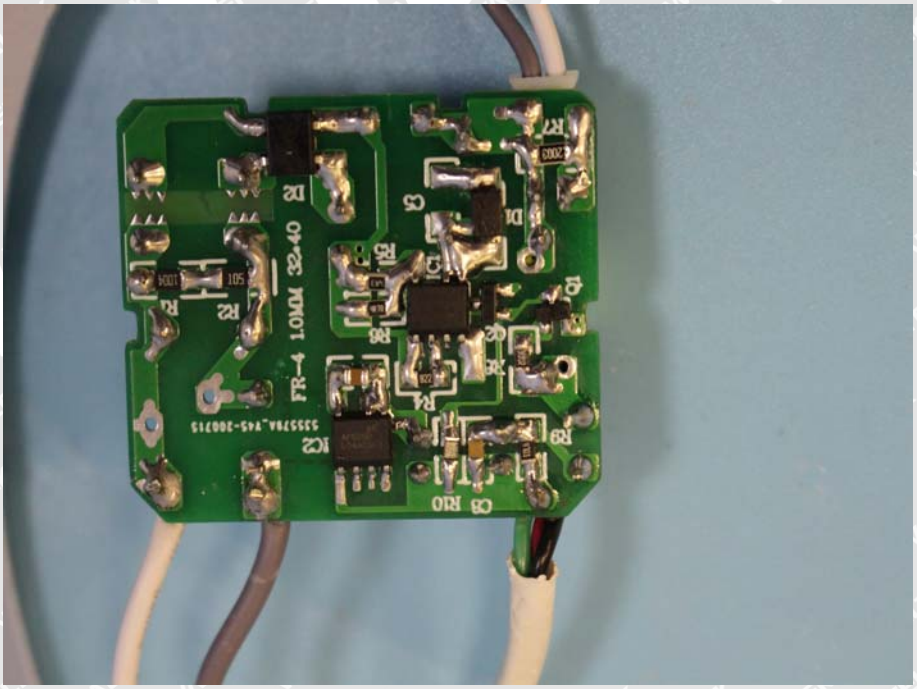

Photo 10

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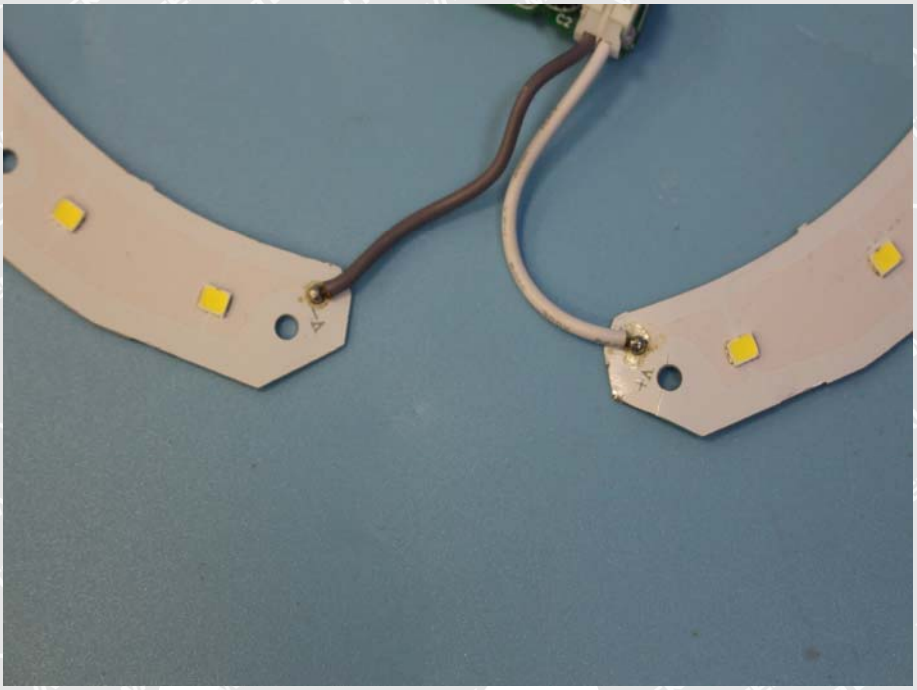
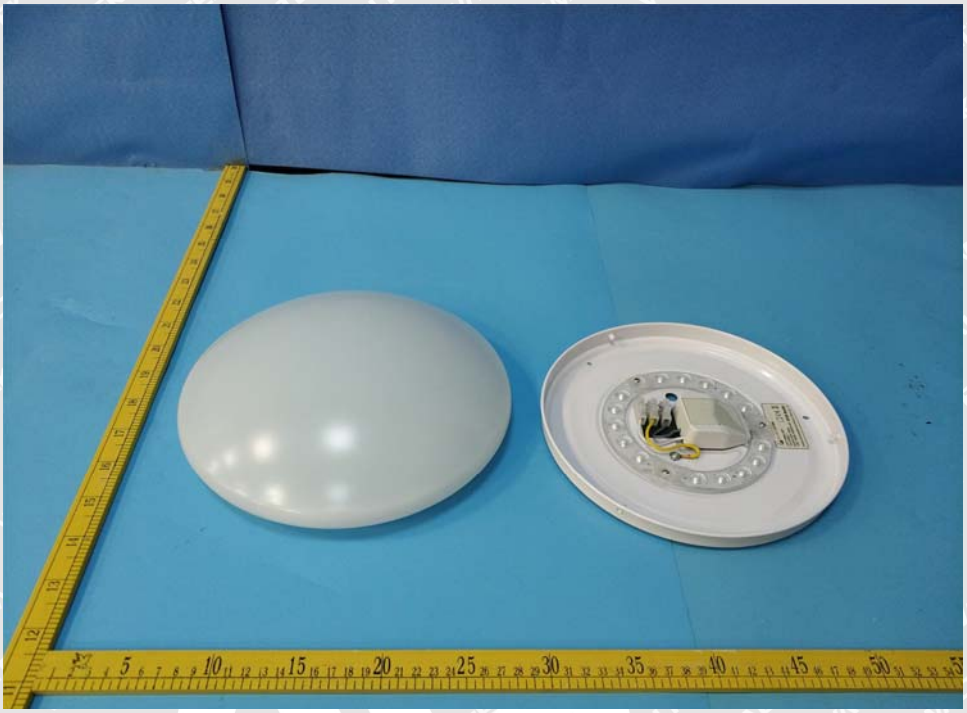


Photo 11

Model: 191143001-1

Photo 12

Photo Documentation



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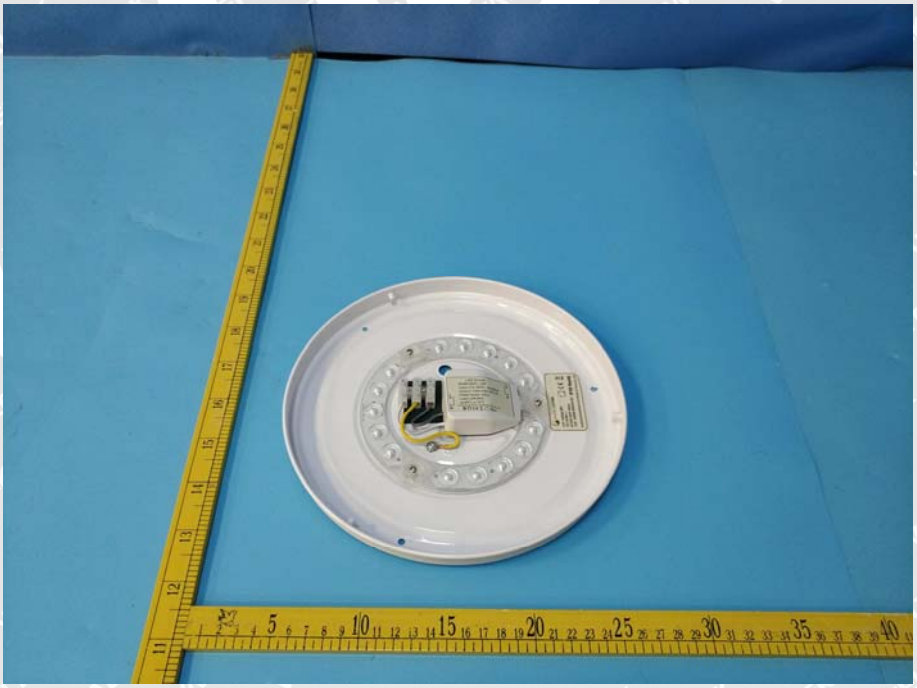

Photo 14

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