LVD TEST REPORT

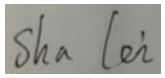
Report No.:	SET2015-09441
Product:	LED Fire Rated Downlight
Model No. :	5RS015-1, 5RS015-2, 5RS015-3, 5RS015-4, 5RS015-5
Brand Name:	--
Applicant:	Suzhou Radiant Lighting Technology Co., Ltd
Issued by:	CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd
Lab Location:	Electronic Testing Building, Shahe Road, Xili, Nanshan District, Shenzhen, 518055, P. R. China **Tel:** 86 755 26628136 **Fax:** 86 755 27601436

Query No. :IZJRbKSG

Test Report

Product	:	LED Fire Rated Downlight
Model No.	:	5RS015-1, 5RS015-2, 5RS015-3, 5RS015-4, 5RS015-5
Brand Name	:	--
Applicant	:	Suzhou Radiant Lighting Technology Co., Ltd
Applicant Address	:	Jiatai Road West, Shuanglong Industrial Park, Fenghuang Town, Zhangjiagang City, Jiangsu, China
Manufacturer	:	Suzhou Radiant Lighting Technology Co., Ltd
Manufacturer Address	:	Jiatai Road West, Shuanglong Industrial Park, Fenghuang Town, Zhangjiagang City, Jiangsu, China
Rating	:	100-240V~, 50/60Hz, 8W
Test Standards	:	EN 60598-2-2: 2012 Luminaires - Part 2-2: Particular requirements - Recessed luminaires EN 60598-1:2008 +A11: 2009 Luminaires - Part 1: General requirements and tests EN 61347-2-13: 2006 Lamp controlgear - Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules EN 61347-1: 2008 + A1: 2011 +A2: 2013 Lamp controlgear - Part 1: General and safety requirements EN 62031: 2008 +A1: 2013 +A2: 2015 LED modules for general lighting - Safety specifications EN 62471: 2008 Photobiological safety of lamps and lamp systems; EN 62493: 2010 Assessment of lighting equipment related to human exposure to electromagnetic fields
Test Result	:	PASS

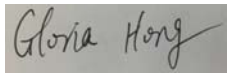
Tested by .....: Sha Lei



June. 30, 2015

Signature, Date

Reviewed by .....: Gloria Hong



June. 30, 2015

Signature, Date

Approved by .....: Wu Li An

June. 30, 2015

Signature, Date

Test item particulars:	
Classification of installation and use	Recessed luminaires
Supply Connection	Terminals
Protection against electric shock.....	CLASS I
IP	IPXX
ta.....	25°C
Testing	
Date of receipt of test item.....:	2015-06-16
Date(s) of performance of test .....:	2015-06-16 to 2015-06-30
Date of report issue .....:	2015-06-30
Factory…….....:	Suzhou Radiant Lighting Technology Co., Ltd
Address.....:	Jiatai Road West, Shuanglong Industrial Park, Fenghuang Town, Zhangjiagang City, Jiangsu, China

Test case verdicts

Test case does not apply to the test object .....:	N/A
Test item does meet the requirement .....:	P(ass)
Test item does not meet the requirement.....:	F(ail)
.....:	

General remarks:	Attached with:
This test report shall not be reproduced except in full without the written approval of the testing laboratory. The test results presented in this report relate only to the item tested. "(see remark #)" refers to a remark appended to the report.	ANNEX 5: LAMP CONTROLGEAR - PART 2-13: PARTICULAR REQUIREMENTS FOR D.C. OR A.C. SUPPLIED ELECTRONIC CONTROLGEAR FOR LED MODULES ANNEX 6: LED MODULES FOR GENERAL LIGHTING - SAFETY SPECIFICATIONS ANNEX 7: PHOTOBIOLOGICAL SAFETY OF LAMPS AND LAMP SYSTEMS ANNEX 8: ASSESSMENT OF LIGHTING EQUIPMENT RELATED TO HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS ANNEX 9: PHOTO DOCUMENT

General descriptions:

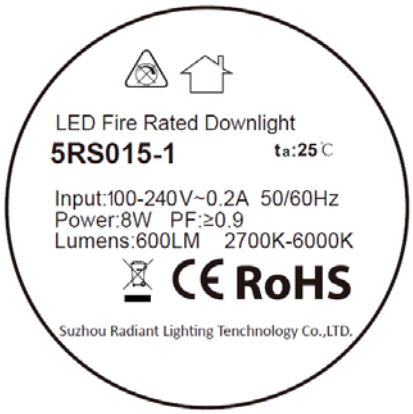
The product is a LED Fire Rated Downlight with built-in LED driver for indoor use.
LED driver test in appliance, Details see annex 5 and annex 6.

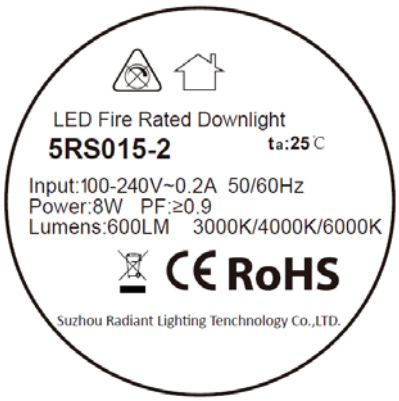
Model difference

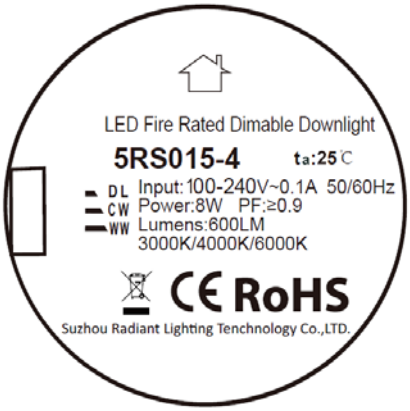
All models included in this report are similar in electrical and constructions except for LED driver. Details information is shown in the following table.

Model name	Rating	LED Driver model	Transformer for LED Driver	Dimming funcation
5RS015-1	100-240Vac 50/60Hz 8W	RT7.815.B99A 20150606	EE1621	--
5RS015-2		RT7.815.B91A 20150513	EE1621	--
5RS015-3		RT7.815.B86A 20150415	EE1619	Dimming
5RS015-4		RT7.815.B92A 20150520	EE1622	Dimming
5RS015-5		RT7.815.B89A 20150512	EE1622	Dimming

See copy of marking plate







EN 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
2.3 (0)	**GENERAL TEST REQUIREMENTS**		—
2.3 (0.1)	Information for luminaire design considered	Standard Yes ☒ No ☐	—
2.3 (0.3)	More sections applicable .....:	Yes ☐ No ☒	—
2.5 (2)	**CLASSIFICATION**		—
2.5 (2.2)	Type of protection (Class 0 excluded)..... :	Class I	—
2.5 (2.3)	Degree of protection (Requirement: Ordinary)..... :	IPXX	—
2.5 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces..... :	Yes ☒ No ☐	—
	Luminaire not suitable for direct mounting on normally flammable surfaces..... :	Yes ☐ No ☒	—
2.5 (2.5)	Luminaire for normal use ..... :	Yes ☒ No ☐	—
	Luminaire for rough service ..... :	Yes ☐ No ☒	—
2.6 (3)	**MARKING**		P
2.6 (3.2)	Mandatory markings	See rating label	P
	Position of the marking		P
	Format of symbols/text		P
2.6 (3.3)	Additional information		P
	Language of instructions	In English	P
2.6 (3.3.1)	Combination luminaires		N
2.6 (3.3.2)	Nominal frequency in Hz	50/60Hz	P
2.6 (3.3.3)	Operating temperature	25 ˚C	P
2.6 (3.3.4)	Symbol or warning notice		N
2.6 (3.3.5)	Wiring diagram		N
2.6 (3.3.6)	Special conditions		N
2.6 (3.3.7)	Metal halide lamp luminaire – warning		N
2.6 (3.3.8)	Limitation for semi-luminaires	Not replaceable light source	N
2.6 (3.3.9)	Power factor and supply current		P
2.6 (3.3.10)	Suitability for use indoors	Indoors	P
2.6 (3.3.11)	Luminaires with remote control		N
2.6 (3.3.12)	Clip-mounted luminaire – warning		N

EN 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
2.6 (3.3.13)	Specifications of protective shields		N
2.6 (3.3.14)	Symbol for nature of supply		P
2.6 (3.3.15)	Rated current of socket outlet		N
2.6 (3.3.16)	Rough service luminaire		N
2.6 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments	Type Y	P
2.6 (3.3.18)	Non-ordinary luminaires with PVC cable		N
2.6 (3.3.19)	Protective conductor current in instruction if applicable		N
2.6 (3.3.20)	Provided with information if not intended to be mounted within arms reach	Only to be installed outside arms reach	P
2.6 (3.4)	Test with water	Rubbing lightly for 15 s	P
	Test with hexane	Rubbing lightly for 15 s	P
	Legible after test		P
	Label attached		P
2.7 (4)	**CONSTRUCTION**		P
2.7 (4.2)	Components replaceable without difficulty		P
2.7 (4.3)	Wireways smooth and free from sharp edges		P
2.7 (4.4)	Lampholders		N
2.7 (4.4.1)	Integral lampholder		N
2.7 (4.4.2)	Wiring connection		N
2.7 (4.4.3)	Lampholder for end-to-end mounting		N
2.7 (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
2.7 (4.4.5)	Peak pulse voltage	No ignitor	N
2.7 (4.4.6)	Centre contact	No lampholder	N

EN 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
2.7 (4.4.7)	Parts in rough service luminaires resistant to tracking		N
2.7 (4.4.8)	Lamp connectors		N
2.7 (4.4.9)	Caps and bases correctly used		N
2.7 (4.5)	Starter holders		N
	Starter holder in luminaires other than class II		N
	Starter holder class II construction		N
2.7 (4.6)	Terminal blocks		P
	Tails		N
	Unsecured blocks		N
2.7 (4.7)	Terminals and supply connections		N
2.7 (4.7.1)	Contact to metal parts		N
2.7 (4.7.2)	Test 8 mm live conductor		N
	Test 8 mm earth conductor		N
2.7 (4.7.3)	Terminals for supply conductors		N
2.7 (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
2.7 (4.7.4)	Terminals other than supply connection		P
2.7 (4.7.5)	Heat-resistant wiring/sleeves		N
2.7 (4.7.6)	Multi-pole plug		N
	- test at 30 N		N
2.7 (4.8)	Switches:		N
	- adequate rating		N
	- adequate fixing		N
	- polarized supply		N
	- compliance with 61058-1 for electronic switches		N
2.7 (4.9)	Insulating lining and sleeves		N

EN 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
2.7 (4.9.1)	Retainement		N
	Method of fixing ..... :	---	N
2.7 (4.9.2)	Insulated linings and sleeves		N
	Resistant to a temperature > 20 °C to the wire temperature or		N
	a) & c) Insulation resistance and electric strength		N
	b) Ageing test. Temperature (°C) ..... :	---	N
2.7 (4.10)	Insulation of Class II luminaires		N
2.7 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		N
	Safe installation fixed luminaires		N
	Capacitors and switches		N
	Interference suppression capacitors according to IEC 60384-14		N
2.7 (4.10.2)	Assembly gaps:		N
	- not coincidental		N
	- no straight access with test probe		N
2.7 (4.10.3)	Retainment of insulation:		N
	- fixed		N
	- unable to be replaced; luminaire inoperative		N
	- sleeves retained in position		N
	- lining in lampholder		N
2.7 (4.11)	Electrical connections		P
2.7 (4.11.1)	Contact pressure		N
2.7 (4.11.2)	Screws:		N
	- self-tapping screws		N
	- thread-cutting screws		N
2.7 (4.11.3)	Screw locking:		N
	- spring washer		N
	- rivets		N
2.7 (4.11.4)	Material of current-carrying parts	> 50% Cu	P
2.7 (4.11.5)	No contact to wood or mounting surface		P
2.7 (4.11.6)	Electro-mechanical contact systems		N
2.7 (4.12)	Mechanical connections and glands		P

EN 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
2.7 (4.12.1)	Screws not made of soft metal		N
	Screws of insulating material		N
	Torque test: torque (Nm); part ..... :	---	N
2.7 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N
2.7 (4.12.4)	Locked connections:		N
	- fixed arms; torque (Nm)..... :	---	N
	- lampholder; torque (Nm) ..... :	---	N
	- push-button switches; torque 0,8 Nm..... :	---	N
2.7 (4.12.5)	Screwed glands; force (Nm)..... :	---	N
2.7 (4.13)	Mechanical strength		P
2.7 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm)..... :	--	N
	- other parts; energy (Nm) ..... :	Lampshade: 0.35Nm	P
	1) live parts		N
	2) linings		N
	3) protection		N
	4) covers		N
2.7 (4.13.3)	Straight test finger	Enclosure: 30N	P
2.7 (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
2.7 (4.13.6)	Tumbling barrel		N
2.7 (4.14)	Suspensions and adjusting devices		P
2.7 (4.14.1)	Mechanical load:		P
	A) four times the weight	4 x 0.35 kg = 1.4 kg	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

EN 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Metal rod. diameter (mm) ..... :		N
	Fixed luminaire or independent control gear without fixing devices		N
2.7 (4.14.2)	Load to flexible cables		N
	Mass (kg) ..... :	Not suspended by flexible cable or cord	N
	Stress in conductors (N/mm²) ..... :	---	N
	Mass (kg) of semi-luminaire ..... :	---	N
	Bending moment (Nm) of semi-luminaire ..... :	---	N
2.7 (4.14.3)	Adjusting devices:		N
	- flexing test; number of cycles ..... :	No adjusting device	N
	- strands broken		N
	- electric strength test afterwards		N
2.7 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors	No such part	N
2.7 (4.14.5)	Guide pulleys		N
2.7 (4.14.6)	Strain on socket-outlets		N
2.7 (4.15)	Flammable materials:		P
	- glow-wire test 650 °C		P
	- spacing ≥ 30 mm		N
	- screen withstanding test of 13.3.1		N
	- screen dimensions		N
	- no fiercely burning material		N
	- thermal protection		N
	- electronic circuits exempted		N
2.7 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		P
	a) construction		P
	b) temperature sensing control		N
	c) surface temperature		N
2.7 (4.16)	Luminaires for mounting on normally flammable surfaces		P
	No lamp control gear		N
2.7 (4.16.1)	Lamp control gear spacing:		N
	- spacing 35 mm		N
	- spacing 10 mm		N

EN 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
2.7 (4.16.2)	Thermal protection:		N
	- in lamp control gear		N
	- external		N
	- fixed position		N
	- temperature marked lamp control gear		N
2.7 (4.16.3)	Design to satisfy the test of 12.6		N
2.7 (4.17)	Drain holes		N
	Clearance at least 5 mm		N
2.7 (4.18)	Resistance to corrosion:		N
2.7 (4.18.1)	- rust-resistance		N
2.7 (4.18.2)	- season cracking in copper		N
2.7 (4.18.3)	- corrosion of aluminium		N
2.7 (4.19)	Ignitors compatible with ballast		N
2.7 (4.20)	Rough service vibration		N
2.7 (4.21)	Protective shield:		N
2.7 (4.21.1)	Shield fitted		N
	Shield of glass if tungsten halogen lamps		N
2.7 (4.21.2)	Particles from a shattering lamp not impair safety		N
2.7 (4.21.3)	No direct path		N
2.7 (4.21.4)	Impact test on shield		N
	Glow-wire test on lamp compartment		N
2.7 (4.22)	Attachments to lamps		N
2.7 (4.23)	Semi-luminaires comply Class II		N
2.7 (4.24)	UV radiation for tungsten halogen lamps and metal halide lamps (Annex P)		N
2.7 (4.25)	No sharp point or edges		P
2.7 (4.26)	Short-circuit protection:		N
2.7 (4.26.1)	Uninsulated accessible SELV parts		N
2.7 (4.26.2)	Short-circuit test		N
2.7 (4.26.3)	Test chain according to Figure 29		N

2.8 (11)	**CREEPAGE DISTANCES AND CLEARANCES**		**P**
	Working voltage (V) ..... :	100-240 Vac	—

EN 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Voltage form	Sinusoidal ☒ Non-sinusoidal ☐	—
	PTI	< 600 ☒ ≥ 600 ☐	—
	Impulse withstand category (Normal category II) (Category III Annex U)	Category II☒ Category III☐	—
	Rated pulse voltage (kV) ..... :	---	—
	(1) Current-carrying parts of different polarity: cr (mm); cl (mm) ..... :	Between input L and N on terminal block Cr>Cl=3.0mm	P
	(2) Current-carrying parts and accessible parts: cr (mm); cl (mm) ..... :	Between live parts and metal enclosure: Cr>Cl>6.5mm	P
	(3) Parts becoming live due to breakdown of basic insulation and metal parts: cr (mm); cl (mm) ..... :	---	N
	(4) Outer surface of cable where it is clamped and metal parts: cr (mm); cl (mm) ..... :	---	N
	(5) Not used		N
	(6) Current-carrying parts and supporting surface: cr (mm); cl (mm) ..... :	Between live parts and mounting surface : Cr>Cl>8.0mm	P

2.9 (7)	**PROVISION FOR EARTHING**		P
2.9 (7.2.1 + 7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		P
	Resistance < 0,5 Ω		P
	Self-tapping screws used		N
	Thread-forming screws		P
	Thread-forming screw used in a grove		N
	Earth makes contact first		P
2.9 (7.2.2 + 7.2.3)	Earth continuity in joints etc.		N
2.9 (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
2.9 (7.2.5)	Earth terminal integral part of connector socket		N
2.9 (7.2.6)	Earth terminal adjacent to mains terminals		P

EN 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
2.9 (7.2.7)	Electrolytic corrosion of the earth terminal		N
2.9 (7.2.8)	Material of earth terminal		P
	Contact surface bare metal		P
2.9 (7.2.10)	Class II luminaire for looping-in		N
	Double or reinforced insulation to functional earth		N
2.9 (7.2.11)	Earthing core coloured green-yellow		P
	Length of earth conductor		P
2.10 (14)	**SCREW TERMINALS**		**N**
	Separately approved; component list		N
	Part of the luminaire		N
2.10 (15)	**SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS**		N
	Separately approved; component list		N
	Part of the luminaire		N
2.11 (5)	**EXTERNAL AND INTERNAL WIRING**		P
2.11 (5.2)	Supply connection and external wiring		P
2.11 (5.2.1)	Means of connection ..... :	Power cord with terminal	P
2.11 (5.2.2)	Type of cable ..... :	PVC	P
	Nominal cross-sectional area (mm²) ..... :	1.0 mm^2	P
	Cables equal to HD21 or HD22		P
2.11 (5.2.3)	Type of attachment, X, Y or Z	Type Y	P
2.11 (5.2.5)	Type Z not connected to screws		N
2.11 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
2.11 (5.2.7)	Cable entries through rigid material have rounded edges		P
2.11 (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

EN 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
2.11 (5.2.9)	Locking of screwed bushings		N
2.11 (5.2.10)	Cord anchorage:		P
	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		N
	- no tying of cables into knots etc.		N
	- insulating material or lining		N
2.11 (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
	Glands not used as anchorage		N
	Labyrinth type anchorages		N
2.11 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		P
2.11 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N) ..... :	80	P
	- torque test: torque (Nm) ..... :	0.35	P
	- displacement ≤ 2 mm		P
	- no movement of conductors		P
	- no damage of cable or cord		P
2.11 (5.2.11)	External wiring passing into luminaire		N
2.11 (5.2.12)	Looping-in terminals		P
2.11 (5.2.13)	Wire ends not tinned		N
	Wire ends tinned: no cold flow		N
2.11 (5.2.14)	Mains plug same protection		N
	Class III luminaire plug		N

EN 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
2.11 (5.2.16)	Appliance inlets (IEC 60320)		N
	Appliance couplers of class II type		N
2.11 (5.2.17)	No standardized interconnecting cables properly assembled		N
2.11 (5.2.18)	Used plug in accordance with		N
	- IEC 60083		N
	- other standard		N
2.11 (5.3)	Internal wiring		P
2.11 (5.3.1)	Internal wiring of suitable size and type		N
	Through wiring		N
	- not delivered/ mounting instruction		N
	- factory assembled		N
	- socket outlet loaded (A)..... :	---	N
	- temperatures ..... :	---	N
	Green-yellow for earth only		N
2.11 (5.3.1.1)	Internal wiring connected directly to fixed wiring		N
	Cross-sectional area (mm²)..... :		N
	Insulation thickness		N
	Extra insulation added where necessary		N
2.11 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		N
	Adequate cross-sectional area and insulation thickness		N
2.11 (5.3.1.3)	Double or reinforced insulation for class II		N
2.11 (5.3.1.4)	Conductors without insulation		N
2.11 (5.3.1.5)	SELV current-carrying parts		N
2.11 (5.3.1.6)	Insulation thickness other than PVC or rubber		N
2.11 (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
2.11 (5.3.3)	Insulating bushings:		N
	- suitable fixed		N
	- material in bushings		N

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Clause	Requirement + Test	Result - Remark	Verdict
	- material not likely to deteriorate		N
	- cables with protective sheath		N
2.11 (5.3.4)	Joints and junctions effectively insulated		N
2.11 (5.3.5)	Strain on internal wiring		N
2.11 (5.3.6)	Wire carriers		N
2.11 (5.3.7)	Wire ends not tinned		N
	Wire ends tinned: no cold flow		N
2.12 (8)	**PROTECTION AGAINST ELECTRIC SHOCK**		**P**
2.12 (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		P
	Basic insulated parts not accessible with Ø 50 mm probe from outside, within arms reach, on wall-mounted luminaires		P
	Lamp 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
2.12 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N
2.12 (8.2.3.a)	Class II luminaire:		N
	- basic insulated metal parts not accessible during starter or lamp replacement		N
	- basic insulation not accessible other than during starter or lamp replacement		N
	- glass protective shields not used as supplementary insulation	No such part	N

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Clause	Requirement + Test	Result - Remark	Verdict
2.12 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N
2.12 (8.2.3.c)	Class III luminaires with exposed SELV parts:		N
	Ordinary luminaire:		N
	- touch current ..... :	---	N
	- no-load voltage ..... :	---	N
	Other than ordinary luminaire:		N
	- nominal voltage ..... :	---	N
2.12 (8.2.4)	Portable luminaire:		N
	- protection independent of supporting surface		N
	- terminal block completely covered		N
2.12 (8.2.5)	Compliance with the standard test finger or relevant probe		N
2.12 (8.2.6)	Covers reliably secured		N
2.12 (8.2.7)	Discharging of capacitors ≥ 0,5 μF		N
	Portable plug connected luminaire with capacitor		N
	Other plug connected luminaire with capacitor		N
	Discharge device on or within capacitor		N
	Discharge device mounted separately		N
2.13 (12)	**ENDURANCE TEST AND THERMAL TEST**		**P**
2.13 (12.3)	Endurance test:		P
	- mounting-position ..... :	Acc. to user manual	—
	- test temperature (°C) ..... :	35°C	—
	- total duration (h) ..... :	240 h	—
	- supply voltage: Un factor; calculated voltage (V):	264 VDC	—
	- lamp used ..... :	Integral LED module	—
2.13 (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
2.13 (12.4)	Thermal test (normal operation)	(see Annex 2)	P

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Clause	Requirement + Test	Result - Remark	Verdict
2.13 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	P
2.13 (12.6)	Thermal test (failed lamp control gear condition):		N
2.13 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A) ..... :		—
	- case of abnormal conditions..... :		—
	- electronic lamp control gear		N
	- measured winding temperature (°C): at 1,1 Un :		—
	- measured mounting surface temperature (°C) at 1,1 Un ..... :		N
	- calculated mounting surface temperature (°C) . :		N
	- track-mounted luminaires		N
2.13 (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
2.13 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N
2.13 (12.7.1)	Luminaire without temperature sensing control		N
2.13 (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..... :	---	—

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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
2.13 (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..... :	---	—
	- calculated temperature of fixing point/exposed part (°C) ..... :	---	—
	Ball-pressure test:		N
	- part tested; temperature (°C)..... :	---	N
	- part tested; temperature (°C)..... :	---	N
2.13 (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
2.13 (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:		N
	- part tested; temperature (°C)..... :	---	N
	- part tested; temperature (°C)..... :	---	N
2.13.1	Wiring, for connection to the supply, which passes into or can touch the luminaire shall not reach unsafe temperature.		P

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Clause	Requirement + Test	Result - Remark	Verdict
2.14 (9)	**RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE**		**P**
2.14 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP ..... :	IP00	—
	- mounting position during test ..... :	---	—
	- fixing screws tightened; torque (Nm)..... :	---	—
	- tests according to clauses ..... :	---	—
	- electric strength test afterwards		N
	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 SELV parts or where it could become a hazard		N
	d) i) For luminaires without drain holes – no water entry		N
	d) ii) For luminaires with drain holes – no hazardous water entry		N
	e) no water in watertight luminaire		N
	f) no contact with live parts (IP 2X)		N
	f) no entry into enclosure (IP 3X and IP 4X)		N
	f) no contact with live parts (IP3X and IP4X)		N
	g) no trace of water on part of lamp requiring protection from splashing water		N
	h) no damage of protective shield or glass envelope		N
2.14 (9.3)	Humidity test 48 h		P

2.15 (10)	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		**P**
2.15 (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
	- between current-carrying parts of different polarity ..... :	---	N
	- between current-carrying parts and mounting surface ..... :	---	N

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Clause	Requirement + Test	Result - Remark	Verdict
	- between current-carrying parts and metal parts of the luminaire ..... :	---	N
	Other than SELV:		P
	- between live parts of different polarity..... :	>10MΩ	P
	- between live parts and mounting surface..... :	>100MΩ	P
	- between live parts and metal parts..... :	>100MΩ	P
2.15 (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
	- 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
	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
2.15 (10.3)	Touch current (mA)..... :	0.062	P
	Protective conductor current..... :	---	N
2.16 (13)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		**P**
2.16 (13.2.1)	Ball-pressure test:		P
	- part tested; temperature (°C)..... :	Connector; 125°C	P
	- part tested; temperature (°C)..... :	--	N
	- part tested; temperature (°C)..... :	--	N
2.16 (13.3.1)	Needle flame test (10 s):		N
	- part tested..... :	--	N
	- part tested..... :	--	N

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Clause	Requirement + Test	Result - Remark	Verdict
	- part tested.....:	--	N
2.16 (13.3.2)	Glow-wire test (650°C):		N
	- part tested.....:	--	N
	- part tested.....:	--	N
	- part tested.....:	--	N
2.16 (13.4.1)	Tracking test:		N
	- part tested.....:	--	N
	National Differences for (country name) or Group Differences		P
	CENELEC COMMON MODIFICATIONS (EN)		P
2.6 (3)	**MARKING**		P
2.6 (3.3.101)	Adequate warning on the package		N
2.7 (4)	**CONSTRUCTION**		P
2.7 (4.11.6)	Electro-mechanical contact systems		N
2.11 (5)	**EXTERNAL AND INTERNAL WIRING**		P
2.11 (5.2.1)	Connecting leads		P
	- without a means for connection to the supply		N
	- terminal block specified		P
	- relevant information provided		P
	- compliance with 4.6, 4.7.1, 4.7.2, 4.10.1, 11.2, 12 and 13.2 of Part 1		P
2.11 (5.2.2)	Cables equal to HD21 S2 or HD22 S2		P
2.13 (12)	**ENDURANCE TEST AND THERMAL TEST**		P
2.13 (12.4.2c)	Thermal test (normal operation)		P
ZB	**ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)**		N
(3.3)	DK: power supply cord with label		N
	IT: warning label on Class 0 luminaire		N
(4.5.1)	DK: socket-outlets		N
(5.2.1)	CY, DK, FI, SE, GB: type of plug		N

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Clause	Requirement + Test	Result - Remark	Verdict

ZC	**ANNEX ZC, NATIONAL DEVIATIONS (EN)**		N
(4 & 5)	FR: Shuttered socket-outlets 10/16A		N
(13.3)	FR: Glow-wire test 850°C alt. 750°C for luminaires in premises open to public or 960°C for luminaires in emergency exits		N
(13.3)	GB: Requirements according to United Kingdom Building Regulation		N

	EN 60598-1:2008 + A11:2009		**P**
	Replace the existing definition 1.2.76 with the following:		P
1.2.76	Impulse withstand category (former term “overvoltage categories”)		P
	Numeral defining a transient overvoltage condition		P
Note 1	Impulse withstand categories I, II, III and IV are used.		P
Note 2	Explanation is taken from IEC 60364-4-44:2007		P
	Table 1.1		P

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Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 1: temperature measurements, thermal tests of Section 12	

	Type reference ..... :	5RS015-1	—
	Lamp used..... :	LED	—
	Lamp control gear used ..... :	LED driver	—
	Mounting position of luminaire ..... :	Normal used	—
	Supply wattage (W)..... :	8.1	—
	Supply current (A) ..... :	0.035	—
	Calculated power factor ..... :	0.890	—
	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..... :	1.06Un=254.4V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :	---	—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage..... :	---	—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :	---	—

temperature (°C) of part	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1	test 2	test 3	limit	test 4	limit
Connector and internal wire	--	62.1	--	150	--	--
Lampshade	--	58.7	--	Ref.	--	--
Mounting surface	--	52.6	--	90	--	--

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Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 1: temperature measurements, thermal tests of Section 12	

	Type reference ..... :	5RS015-3	—
	Lamp used..... :	LED	—
	Lamp control gear used ..... :	LED driver	—
	Mounting position of luminaire ..... :	Normal used	—
	Supply wattage (W)..... :	8.7	—
	Supply current (A) ..... :	0.038	—
	Calculated power factor ..... :	0.903	—
	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..... :	1.06Un=254.4V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :	---	—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage..... :	---	—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :	---	—

temperature (°C) of part	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1	test 2	test 3	limit	test 4	limit
Connector and internal wire	--	70.5	--	150	--	--
Lampshade	--	70.6	--	Ref.	--	--
Mounting surface	--	56.2	--	90	--	--

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Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 1: temperature measurements, thermal tests of Section 12	

	Type reference ..... :	5RS015-5	—
	Lamp used..... :	LED	—
	Lamp control gear used ..... :	LED driver	—
	Mounting position of luminaire ..... :	Normal used	—
	Supply wattage (W)..... :	8.6	—
	Supply current (A) ..... :	0.037	—
	Calculated power factor ..... :	0.902	—
	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..... :	1.06Un=254.4V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :	---	—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage..... :	---	—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :	---	—

temperature (°C) of part	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1	test 2	test 3	limit	test 4	limit
Connector and internal wire	--	60.2	--	150	--	--
Lampshade	--	65.3	--	Ref.	--	--
Mounting surface	--	54.9	--	90	--	--

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Clause	Requirement + Test	Result - Remark	Verdict
	ANNEX 2: 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) .....:		N/A
(14.3.3)	Conductor space (mm).....:		N/A
(14.4)	Mechanical tests		N/A
(14.4.1)	Minimum distance		N/A
(14.4.2)	Cannot slip out		N/A
(14.4.3)	Special preparation		N/A
(14.4.4)	Nominal diameter of thread (metric ISO thread)..:		N/A
	External wiring		N/A
	No soft metal		N/A
(14.4.5)	Corrosion		N/A
(14.4.6)	Nominal diameter of thread (mm) .....:		N/A
	Torque (Nm).....:		N/A
(14.4.7)	Between metal surfaces		N/A
	Lug terminal		N/A
	Mantle terminal		N/A
	Pull test; pull (N).....:		N/A
(14.4.8)	Without undue damage		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	ANNEX 3: 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
(15.5.1)	Terminals internal wiring		N/A
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples)….:		N/A
(15.5.1.2)	Pull test pin or tab terminals (4 N, 4 samples)……:		N/A
	Insertion force not exceeding 50 N		N/A
(15.5.2)	Permanent connections: pull-off test (20 N)		N/A
(15.6)	Electrical tests		N/A
	Voltage drop (mV) after 1 h (4 samples).....:		N/A
	Voltage drop of two inseparable joints		N/A
	Number of cycles .....:		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples).....:		N/A
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples).....:		N/A
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples) .....:		N/A
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples) .....:		N/A
(15.7)	Terminals external wiring		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	Terminal size and rating		N/A
(15.8.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....:		N/A
	Pull test pin or tab terminals (4 samples); pull (N) .....:		N/A
(15.9)	Contact resistance test		N/A
	Voltage drop (mV) after 1 h		N/A

terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										

	Voltage drop of two inseparable joints		
	Voltage drop after 10th alt. 25th cycle		
	Max. allowed voltage drop (mV)..... :		—

terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										

	Voltage drop after 50th alt. 100th cycle		
	Max. allowed voltage drop (mV)..... :		—

terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										

	Continued ageing: voltage drop after 10th alt. 25th cycle		
	Max. allowed voltage drop (mV)..... :		—

terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										

	Continued ageing: voltage drop after 50th alt. 100th cycle		
	Max. allowed voltage drop (mV)..... :		—

terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										

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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 4
LIST OF CRITICAL COMPONENTS

ANNEX 4	List of critical components				P
Object/part No.	**Manufacturer/ trademark**	**Type/model(s)**	**Technical data**	**Standard(s)**	**Mark(s) of conformity**
Connector	Shenzhen BCT Technology Co., Ltd	JN002	400 V, 16 A	EN 60320-1	VDE 40038746
Input lead wire	Shanghai Dinatong Wire Co., Ltd	H05VV-F	3 x 1.0 mm^2	VDE 0281-5	VDE 40021216
Internal wire	DONG GUAN SHENG PAI ELECTRIC WIRE & CABLE CO LTD	3239	24 AWG, 150 °C min.	--	UL E347603
Lampshade	TRINSEO (HONG KONG) LTD	ABS 5700	V-0, 60 °C	--	UL E206114
Enclosure	NAN YA PLASTICS CORP PLASTICS 4TH DIV	640PG(k)	V-0, 95 °C	--	UL E130155
LED	SHEN ZHEN HENG DA OPTOELECTRONICS TECHNOLOGY CO., LTD.	HD-C2017DW013-0904R3-6030AY-B	27.5 V, 0.3 A	EN 60598-2-2 EN 60598-1	Test in appliance
LED driver	Suzhou Radiant Lighting Technology Co., Ltd	RT7.815.B99A 20150606, RT7.815.B91A 20150513, RT7.815.B86A 20150415, RT7.815.B92A 20150520, RT7.815.B89A 20150512	Input: 200-240Vac, 50/60Hz, 8W	EN 61347-2-13 EN 61347-1	Test in appliance
Fuse (Resistor) (for RT7.815.B99A 20150606, RT7.815.B91A 20150513)	SHENZHEN GREAT ELECTRONICS CO LTD	RXF1W	10 ohm, 1 W	--	UL E301541
Fuse (Resistor) (for RT7.815.B86	SHENZHEN GREAT ELECTRONICS CO LTD	RXF1W	47 ohm, 1 W	--	UL E301541

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Clause	Requirement + Test	Result - Remark	Verdict

A 20150415, RT7.815.B92 A 20150520, RT7.815.B89 A 20150512)					
Varistor	Hongzhi Enterprises Ltd	7D471K	470 V	IEC 61051-1 IEC 61051-2	VDE 40008621
(Alternative)	Guangxi New Future Information Industry Co., Ltd	7D471K	470 V	IEC 61051-1 IEC 61051-2	VDE 40030322
Line chock(L1) (for RT7.815.B99 A 20150606, RT7.815.B91 A 20150513)	Suzhou Heicheng Electronics Co., Ltd.	3LA085	Class B, 3.3 mH	EN 61347-2-13 EN 61347-1	Test in appliance
Line chock(L1) (for RT7.815.B86 A 20150415, RT7.815.B92 A 20150520, RT7.815.B89 A 20150512)	Suzhou Heicheng Electronics Co., Ltd.	3LA113	Class B, 5.1 mH	EN 61347-2-13 EN 61347-1	Test in appliance
Transformer (for RT7.815.B99 A 20150606, RT7.815.B91 A 20150513)	Suzhou Heicheng Electronics Co., Ltd.	EE1621	Class B	EN 61347-2-13 EN 61347-1	Test in appliance
Transformer for (for RT7.815.B86 A 20150415)	Suzhou Heicheng Electronics Co., Ltd.	EE1619	Class B	EN 61347-2-13 EN 61347-1	Test in appliance
Transformer (for RT7.815.B92 A 20150520, RT7.815.B89 A 20150512)	Suzhou Heicheng Electronics Co., Ltd.	EE1622	Class B	EN 61347-2-13 EN 61347-1	Test in appliance
-Bobbin	CHANG CHUN PLASTICS CO LTD	T375J	V-0, 150 °C	--	UL E59481
-Tape	JINGJIANG YAHUA PRESSURE	PZ	130 °C	--	UL E165111

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Clause	Requirement + Test	Result - Remark	Verdict

	SENSITIVE GLUE CO LTD				
-Winding	WUXI JUFENG COMPOUND LINE CO LTD	2UEW	130 °C	--	UL E206882
-Triple insulation wire	GREAT LEOFLON INDUSTRIAL CO LTD	TRW(B)	130 °C	--	UL E211989
-Varnish	SUZHOU TAIHU ELECTRIC ADVANCED MATERIAL CO LTD	T-4260(a)	130 °C	--	UL E228349
Y-capacitor	Anshan KEI Fat Electronic Ceramic Technical Co.,Ltd	CT7	2200 pF	EN 60384-14	VDE 40011817
PCB	LIANMENG ELECTRONICS HUIYANG CO LTD	LM-2, LM-3	V-0, 130 °C	--	UL E469262
(Alternative)	Various	Various	V-0, 130 °C	--	UL

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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 5
LAMP CONTROLGEAR - PART 2-13: PARTICULAR REQUIREMENTS FOR D.C. OR A.C. SUPPLIED ELECTRONIC CONTROLGEAR FOR LED MODULES

4 (4)	**CLASSIFICATION**		**P**
	Compliance of independent control gear enclosure with EN 60 598-1		P
	Independent SELV control gear comply with Annex I	(see Annex I)	P

6 (6)	**CLASSIFICATION**		**P**
	Independent controlgear.....:	Yes ☐ No ☒	
	Built-in controlgear .....:	Yes ☒ No ☐	
	Integral controlgear .....:	Yes ☐ No ☒	
	SELV- equivalent or isolating controlgear .....:	Yes ☒ No ☐	
	Auto-wound controlgear .....:	Yes ☐ No ☒	
	Independent SELV controlgear .....:	Yes ☐ No ☒	

7	**MARKING**		**P**
7.1 (7.1)	Mandatory markings:		P
	- mark of origin	See rating label	P
	- model number, type reference .....:	See model difference	P
	- symbol for independent controlgear, if applicable		P
	- correlation between interchangeable parts and controlgear marked		N
	- rated supply voltage (V) .....:	100-240V	P
	- earthing symbol		P
	- wiring diagram		P
	- value of tc	75 °C	P
	- symbol for declared temperature	Ta 50 °C	P
	Constant voltage type:	Yes ☐ No ☒	
	- rated output voltage (V) .....:		N
	Constant current type:	Yes ☒ No ☐	
	- rated output current (A) .....:	0.285	P
	- rated maximum output voltage (V) .....:	21	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- indication if for LED modules only		P
7.2 (7.1)	Information to be provided, if applicable:		P
	- declaration on protection against accidental contact		P
	- cross-section of conductors (mm²) .....:	1.0	P
	- number, type and wattage of lamp(s)		N
	- directly mains-connected windings		N
	- SELV-equivalent controlgear		P
- (7.2)	Marking durable and legible		P
	Rubbing 15 s water, 15 s petroleum; marking legible		P
8 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		**P**
- (10.1)	Controlgear protected against accidental contact with live parts		P
- (A.2)	Current measured according to IEC 60990, figure 4 and clause 7.1: max. 0,7 mA (peak) or 2,0 mA d.c., for f > 1000 Hz max. 70 mA .....:	0.132mA max.	P
- (A.3)	Voltage at 50 kΩ (V): max. 34 V (peak) .....:	0.41V max.	P
	Lacquer or enamel not used for protection or insulation		N
	Adequate mechanical strength on parts providing protection		P
- (10.2)	Capacitors > 0,5 F: voltage after 1 min (V): < 50 V .....:		N
8.1 (-)	SELV-equivalent controlgear accessible parts are insulated from live parts by double or reinforced insulation according 8.6 and 13.1 in IEC 60065		P
8.2 (-)	Exposed terminals of SELV or SELV-equivalent controlgear are allowed if: - the rated or maximum output voltage does not exceeding 25 V r.m.s. - the no-load output voltage does not exceed 30 V r.m.s. or 33 √2 V peak		N
	Insulated terminals if rated output voltage >25 V		N
	One capacitor Y1 or two capacitors Y2 of the same values used in series between SELV or SELV-equivalent output and primary circuits - Capacitor complying with IEC 60384-14 - Other components bridging the separating transformer complying with EN 60065, clause 14		P

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Clause	Requirement + Test	Result - Remark	Verdict

9 (8)	**TERMINALS**		**N**
	Screw terminals: compliance with Section 14 of IEC 60598-1		N
	Screwless terminals: compliance with Section 15 of IEC 60598-1		N

10 (9)	**PROVISION FOR EARTHING**		P
	External metal parts connected to the earth terminal:		P
	- compliance with 7.2.1 in IEC 60598-1		P
	Test with a current of 10 A between earthing terminal and each of the accessible metal parts; measured resistance ( ): < 0,5Ω .....:	0.020Ω	P
	Protective earth, symbol		P
	Terminal complying with clause 8 in Part 1		P
	Locked against loosening and not possible to loosen by hand		P
	Not possible to loosen clamping means unintentionally on screwless terminals		N
	Earthing via means of fixing		P
	Earthing terminal only used for the earthing of the control gear		P
	All parts of material minimizing the danger of electrolytic corrosion		P
	Made of brass or equivalent material		P
	Contact surface bare metal		P
	Conductors by tracks on printed circuit boards:		P
	- a.c. current of 25 A for 1 min between earthing terminal and accessible metal parts		P
	The voltage drop between the earthing terminal or earthing contact and the accessible metal part shall be measured and the resistance calculated from the current and the voltage drop. In no case shall the resistance exceed 0,5 Ω. (A1:2011)		P

11 (11)	**MOISTURE RESISTANCE AND INSULATION**		**P**
	After storage 48 h at 91-95% relative humidity and 20-30 C measuring of insulation resistance with d.c. 500 V (M): .....:	> 100M	P
	Insulation resistance shall be not less than 2 MΩ for basic insulation and 4 MΩ for reinforced insulation between live parts and the body. (A1:2011)	Between primary circuit and enclosure> 100M;	P

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Clause	Requirement + Test	Result - Remark	Verdict
		Between input terminal and output terminal > 100M.	
	Adequate insulation between input and output terminals not bounded together in SELV-equivalent controlgear		P
12 (12)	**ELECTRIC STRENGTH**		**P**
	Immediately after clause 11 electric strength test for 1 min		P
	Working voltage < 42 V, test voltage 500 V		N
	Working voltage > 42 V, test voltage (V):		P
	Basic insulation, 2U+1000V	1480V	P
	Supplementary insulation, 2U+ 1750V		N
	Reinforced insulation, test voltage (V): 4U+ 2750V	3710V	P
	No flashover or breakdown		P
	Windings in separating transformers in SELV-equivalent control gear according to 14.3.2 of EN 60065		P
13 (13)	**THERMAL ENDURANCE FOR WINDINGS (Not applicable)**		**——**
14 (14)	**FAULT CONDITIONS**		**P**
	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
- (14.1)	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
	Distances on printed boards provided with coating according to IEC 60664-3		P
- (14.2)	Short-circuit or interruption of semiconductor devices	(see appended table)	P
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile	No such materials	N

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Clause	Requirement + Test	Result - Remark	Verdict
- (14.4)	Short-circuit across electrolytic capacitors	(see appended table)	P
- (14.5)	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P
	After the tests the insulation resistance with d.c. 500 V (M) are > 1 MΩ .....:	>100MΩ	P
	Temperature declared thermally protected controlgear fulfil the requirements in Annex C		N
- (14.6)	Connect the controlgear under test to a high-power a.c. supply capable of passing a fault current of at least 160 A+10-0%, as shown in Figure 3. Apply the relevant fault condition. (A1:2011)		P
15	**TRANSFORMER HEATING**		**P**
	Windings of separating transformer in a SELV-equivalent controlgear fulfil the requirements according to 7.1 and 11.2 of IEC 60065	(see appended table)	P
15.1	Temperatures do not exceed the changed values of the values in column 2 of Table 3 of IEC 60065, in respect to relevant ambient temperature at tc, under normal operation	(see appended table)	P
15.2	Temperatures do not exceed the changed values of the values in column 3 of Table 3 of IEC 60065, in respect to relevant ambient temperature at tc, under abnormal conditions of Cl. 16 and fault conditions of Cl. 14		P
	Ambient temperature at ta .....:	50 °C	
16	**ABNORMAL CONDITIONS**		**P**
	Safety not impaired when ballast is operated at any voltage between 90% and 110% of rated voltage		P
16.1	Control gear which are of the constant voltage output type:		
	a) No LED module inserted		N
	b) Double LED modules or equivalent load connected to the output terminals		N
	c) Output terminal short-circuited (20 cm and 200 cm or declared length)		N
	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		N
16.2	Control gear which are of the constant current output type:		
	a) No LED module connected		P
	b) Double the LED modules or equivalent load		P

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Clause	Requirement + Test	Result - Remark	Verdict
	connected in series to the output terminals		
	c) Output terminal short-circuited (20 cm and 200 cm or declared length)		P
	Maximum output voltage not exceeded		P
	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		P
17 (15)	**CONSTRUCTION**		**P**
	Socket-outlet in the output circuit does not accept plugs complying with IEC 60083 and IEC 60906		N
	Not possible to engage plugs accepted by socket-outlet in the output circuit with socket-outlets complying with IEC 60083 and IEC 60906		N
- (15.1)	Wood, cotton, silk, paper and similar fibrous material not use as insulation	No such parts	N
- (15.2)	Printed boards used as internal connections complies with clause 14 of IEC 61347-1		P
18 (16)	**CREEPAGE DISTANCES AND CLEARANCES**		**P**
	Creepage distances and clearances according to Table 3 and 4, as appropriate	(see appended table)	P
	Printed boards see clause 14 of IEC 61347-1		P
	Insulating lining of metallic enclosures		P
19 (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		P
(4.11.2)	Screws:		N
	- self-tapping screws		N
	- thread-cutting screws		N
	- at least two self-tapping screws		N
(4.11.3)	Screw locking:		P
	- spring washer		P
	- rivets		N
(4.11.4)	Material of current-carrying parts	Copper	P
(4.11.5)	No contact to wood	No such parts	N

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Clause	Requirement + Test	Result - Remark	Verdict
(4.12)	Mechanical connections and glands:		P
(4.12.1)	Mechanical stress		N
	Screws not made of soft metal		N
	Screws of insulating material		N
	Torque test: part; torque (Nm) .....:		N
	Torque test: part; torque (Nm) .....:		N
	Torque test: part; torque (Nm) .....:		N
	Torque test: part; torque (Nm) .....:		N
(4.12.2)	Screw diameter < 3 mm screwed into metal		N
(4.12.3)	Void		
(4.12.4)	Locked connections		N
(4.12.5)	Screwed glands: force (N) .....:		N
20 (18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		**P**
(18.1)	Parts of insulating material retaining live parts in position, ball-pressure test:		P
	- part; test temperature (^{o}C,) .....:	PCB, 125 ^{o}C, 0.7 mm	P
	- part; test temperature (^{o}C,) .....:	Bobbin, 125^{o} C, 0.8 mm	P
	- part; test temperature (^{o}C,) .....:	Enclosure, 125 ^{o}C, 1.3 mm	P
(18.2)	Printed boards in accordance with IEC 60249-1, 4.3		P
(18.3)	External parts of insulating material preventing electric shock glow-wire test 650 ^{o}C	Enclosure	P
(18.4)	Parts of insulating material retaining live parts in position, needle-flame test 10 s:	PCB, Bobbin	P
	- flame extinguished within 30 s		P
	- no flaming drops igniting tissue paper		P
(18.5)	Tracking test		N
21 (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

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Clause	Requirement + Test	Result - Remark	Verdict

14	**TABLE: tests of fault conditions**		**P**
Model: RT7.815.B99A 20150606			
Part	Simulated fault	Description	Hazard
BD1(pin1-2)	Short	Fuse opened	No
C31	Short	Fuse opened	No
U1 pin 4-5	Short	Fuse opened	No
CE2	Short	Unit shut down	No
D3	Short	Unit shut down	No
Model: RT7.815.B86A 20150415			
Part	Simulated fault	Description	Hazard
BD1(pin1-2)	Short	Fuse opened	No
C1	Short	Fuse opened	No
Q1 pin 1-2	Short	Fuse opened	No
Q1 pin 1-3	Short	Unit shut down	No
Q1 pin 2-3	Short	Fuse opened	No
C7	Short	Unit shut down	No
D5	Short	Unit shut down	No
Model: RT7.815.B86A 20150512			
Part	Simulated fault	Description	Hazard
BD1(pin1-2)	Short	Fuse opened	No
C1	Short	Fuse opened	No
Q1 pin 1-2	Short	Fuse opened	No
Q1 pin 1-3	Short	Unit shut down	No
Q1 pin 2-3	Short	Fuse opened	No
C7	Short	Unit shut down	No
D5	Short	Unit shut down	No

18 (16)	**TABLE: clearance and creepage distance measurements**					**P**
	Minimum distances for a.c. (50/60 Hz) sinusoidal voltages					P
RMS working voltage (V) not exceeding	50	150	250	500	750	1000
a) between live parts of different polarity.	--	--	Cr.=3.0 mm Cl.=3.0 mm	--	--	--

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Clause	Requirement + Test	Result - Remark	Verdict

b) between live parts and accessible metal parts which are permanently fixed to the lamp control gear, including screws or devices for fixing covers or fixing the lamp control gear to its support		--	--	Cr.=6.0 mm Cl.=6.0 mm	--	--	--
c) for ballasts declared not to rely on the luminaire enclosure for protection against electric shock between live parts and the outer accessible surface of insulating parts		--	--	--	--	--	--
Creepage distances							
- Basic insulation	PTI ≧ 600	0.6	0.8	1.5	3	4	5.5
	< 6001	1.2	1.6	2.5	5	8	10
- Supplementary Insulation	PTI ≧ 600	--	0.8	1.5	3	4	5.5
	PTI < 600	--	1.6	2.5	5	8	10
- Reinforced insulation	PTI ≧ 600	--	3.2	5	6	8	11
Clearances							
- Basic insulation		0.2	0.8	1.5	3	4	5.5
- Supplementary Insulation		--	0.8	1.5	3	4	5.5
- Reinforced insulation		--	1.6	3	6	8	11

	Minimum distances for non-sinusoidal pulse voltages						N
rated pulse voltage (peak kV)	2,0	2,5	3,0	4,0	5,0	6,0	8,0
required minimum distances, clearances (mm)	1,0	1,5	2	3	4	5,5	8
Specify the value measured	--	--	--	--	--	--	--
rated pulse voltage (peak kV)	10	12	15	20	25	30	40
required minimum distances, clearances (mm)	11	14	18	25	33	40	60
Specify the value measured	--	--	--	--	--	--	--
rated pulse voltage (peak kV)	50	60	80	100	--	-	--
required minimum distances, clearances (mm)	75	90	130	170	--	--	--
Specify the value measured	--	--	--	--	--	--	--

A	**ANNEX A, TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS A LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK**		**P**
A.2	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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):		P
A.3	The voltage between the part concerned and any accessible part is measured and does not exceed 34 V (peak):		P

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 controlgear, 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		N
	b) manual resetting type		N
	c) non-renewable, non-resetting type		N
	d) renewable, non-resetting type		N
	e) other type of thermal protection; description :		N
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

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Clause	Requirement + Test	Result - Remark	Verdict
	Introducing of the most onerous test condition determined during test of clause 14		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
	Controlgear according to C5 a) or C5 e) operated until stable conditions are achieved		N
	Automatic-resetting thermal protectors working 3 times		N
	Controlgear according to C5 b) working 6 times		N
	Controlgear 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
E	**ANNEX E – USE OF CONSTANT S OTHER THAN 4500 IN tw TESTS**		**N**
E1	Constant S claimed		N
	Claimed test method		N
E2	Procedure A		N
	Adequate data provided by the manufacturer		N
	The inverse of the slope is greater than or equal to the claimed value of S		N
	Compliance with the failure criteria for procedure B		N
E3	Procedure B		N
	Claimed value of T1		N
	Claimed value of T2		N
	Endurance test carried out at:		N
	T1 (7 samples)		N
	T2 (7 samples)		N
	Duration of test calculated from equation (2)		N
	T1		N
	T2		N

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Clause	Requirement + Test	Result - Remark	Verdict
	During the test: - No open circuit - No breakdown insulation		N
	The claimed constant S is deemed to be verified		N

F	**ANNEX F - DRAUGHT-PROOF ENCLOSURE**		N
	Draught-proof enclosure in accordance with the description		N
	Dimensions of the enclosure		N
	Other design; description		N

H	**ANNEX H - TESTS**		N
	All tests performed in accordance with the advise given in Annex H, if applicable		N

I	**ANNEX I - PARTICULAR ADDITIONAL REQUIREMENTS FOR INDEPENDENT SELV D.C. OR A.C. SUPPLIED ELECTRONIC CONTROLGEAR FOR LED MODULES**		**N**
I.3	Classification		
I.3.1	Class I	Yes ☐ No ☐	
	Class II	Yes ☐ No ☐	
I.3.2	a) non-inherently short circuit proof controlgear	Yes ☐ No ☐	
	b) non-inherently open circuit proof controlgear	Yes ☐ No ☐	
	c) inherently short circuit proof controlgear	Yes ☐ No ☐	
	d) inherently open circuit proof controlgear	Yes ☐ No ☐	
	e) fail safe controlgear	Yes ☐ No ☐	
	f) non-short-circuit proof controlgear	Yes ☐ No ☐	
	g) non-open-circuit proof controlgear	Yes ☐ No ☐	
I.4	Marking		N
	Adequate symbols are used		N
I.5	Protection against electric shock		N
I.5.1	No connection between output winding and body		N
	No connection between output winding and protective earthing circuit		N
I.5.2	Input and output circuits electrically separated from each other		N

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Clause	Requirement + Test	Result - Remark	Verdict
I.5.2.1	Insulation between input and output winding of the HF-transformer consists of double or reinforced insulation		N
	Class II: insulation between input/output and body consists of double or reinforced insulation		N
	Class I: insulation between input and body consists of basic and between output and body supplementary insulation		N
I.5.2.2	Insulation between input and output winding via the core consists of double or reinforced insulation		N
	Insulation between cord and windings of the HD-transformer consists of basic insulation		N
I.5.2.3	Serrated tape, additional layer		N
I.5.2.4	Class I controlgear for fixed connection provided with basic insulation plus protective screening comply with the following conditions:		N
	a) Insulation between the input winding and the protective screen complies with the requirements for basic insulation		N
	b) Insulation between the protective screen and the output winding complies with the requirements for basic insulation		N
	c) Metal screen consists of a metal foil or of a wire wound screen		N
	d) Metal screen so arranged that both edges cannot simultaneously touch a magnetic core		N
	e) Metal screen and its lead-out wire have a cross-section sufficient to ensure that an overload device will open the circuit before the screen is destroyed		N
	f) Lead-out wire sufficiently fixed to the metal screen		N
I.5.2.5	Last turn of each winding of the transformer retained by positive means		N
	Impregnated winding		N
	Winding held together by means of insulating material		N
I.5.3	Components bridging between input and output circuit		N
I.5.3.1	Used capacitors and resistors comply with 8.2		N
I.5.3.2	Used opto-couplers		N
I.6	Heating		N
I.6.1	No excessive temperatures in normal use		N
	Used material classified as Class _____		

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Clause	Requirement + Test	Result - Remark	Verdict
	Stated value of ta _____		
I.6.2	Upri: 1.06 time supply rated voltage		
	Determined temperature rises in windings: - Primary: _____ K - Limit max: _____ K - Secondary: _____ K - Limit max: _____ K		N
	After the test:		N
	- no connections have worked loose		N
	- no reduction of creepage distances and clearances		N
	- no flow of sealing compound		N
	- no operation of protecting devices		N
	- electric strength test between input and output windings		N
I.6.3	Cycling test (10 cycles):		N
I.6.3.1	- heat run at _____ K		N
I.6.3.2	- moisture treatment 48 h		N
I.6.3.3	- vibration test 1 h; 1,5 g		N
I.6.3.4	After the tests:		N
	- insulation resistance		N
	- dielectric strength test at 35 % of specified value; test voltage _____ V		N
	- Current or the ohmic component does not deviates by more than 30 %		N
I.7	Short-circuit and overload protection		N
I.7.1	Upri: 1.06 times rated voltage or 0.94 and 1.06 times rated supply voltage - used voltage V		N
I.7.2 I.7.3 I.7.4	Determined temperature rise in windings and on other parts:		N
	- test according to Clause I.7.3.1 to I.7.3.5		N
	- Primary winding ___K		N
	- Limit max ___ K		N
	- Secondary winding ___ K		N
	- Limit max ___K		N
	- External enclosure ___ K		N

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Clause	Requirement + Test	Result - Remark	Verdict
	- Limit max __K		N
	- Rubber insulation of wiring_____ K		N
	- Limit max __K		N
	- PVC insulation of wiring ___ K		N
	- Limit max __ K		N
	- Supports ___ K		N
	- Limit max ___ K		N
I.7.5	Fail-safe convertors		N
I.7.5.1	- Upri: 1.06 times rated supply voltage V:		
	- Isec: 1.5 times rated output current A:		
	- time until steady-state conditions t1 (h) :		
	- time until failure t2 (h): < t1; < 5 h :		N
I.7.5.2	During the test:		N
	- no flames, molten material, etc.		N
	- temperature rise of enclosure < 150 K		N
	- temperature rise of plywood support < 100 K		N
	After the test:		N
	- electric strength (test voltage; 35 % of specified value); no flashover or breakdown for primary-to-secondary and for primary-to-body		N
	- live parts not accessible by test finger through holes of enclosure		N
I.8	Insulation resistance and electric strength		N
I.8.1	Conditioned 48 h between 91 % and 95 %		N
I.8.2	Adequate insulation (500 V d.c. for 1 min) between:		N
	Live parts and the body -for basic insulation not less than 2 MΩ .....:		N
	Live parts and the body -for reinforced insulation not less than 4 MΩ .....:		N
	Input- and output circuits not less than 5 MΩ .....:		N
	Metal parts of class II controlgear which are separated from live parts by basic insulation only and the body not less than 5 MΩ.....:		N
	Metal foil in contact with the inner and outer surfaces of enclosures of insulating material not less than 2 MΩ .....:		N
I.8.3	Electric strength test:		N

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	1) Between live parts of input circuits and live parts of output circuits.....		N
	2) Over basic or supplementary insulation between:		N
	a) live parts which are or may become of different polarity		N
	b) live parts and enclosure if intended to be connected to protective earth		N
	c) accessible metal parts and a metal rod of the same diameter as the flexible cable or cord		N
	d) live parts and an intermediate metal part.....		N
	e) intermediate metal parts and the body.....		N
	3) Over reinforced insulation between the body and live parts		N
	No flashover or breakdown occurred		N
I.9	Construction		N
I.9.1	Comply with all requirements		N
I.9.2	The distance between input and output terminals shall not be less than 25 mm.....:		N
I.10	Components		N
I.10.1	Socket-outlets in the output circuit does not accept plugs complying with IEC 60083 and IEC 60906-1		N
I.10.2	Self-resetting devices shall not be used unless it is certain that there will be no hazards		N
	Compliance is checked by connecting the controlgear for 48 h at 1.06 times the rated voltage with the output short-circuited		N
I.11	Creepage distances and clearances		N
	1. Insulation between input and output circuits:		N
	a) measured values > specified values (mm) .....:		N
	b) measured values > specified values (mm) .....:		N
	c) measured values > specified values (mm) .....:		N
	2. Insulation between adjacent input circuits: measured values > specified values (mm)		N
	2. Insulation between adjacent output circuits: measured values > specified values (mm)		N
	3. Insulation between terminals for external connection:		N
	a) measured values > specified values (mm)		N
	b) measured values > specified values (mm)		N
	c) measured values > specified values (mm)		N

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	4. Basic or supplementary insulation:		N
	a) measured values > specified values (mm)		N
	b) measured values > specified values (mm)		N
	c) measured values > specified values (mm)		N
	d) measured values > specified values (mm)		N
	e) measured values > specified values (mm)		N
	5. Reinforced insulation: measured values > specified values (mm)		N
	6. Distances through insulation:		N
	a) measured values > specified values (mm)		N
	b) measured values > specified values (mm)		N
	c) measured values > specified values (mm)		N
	d) measured values > specified values (mm)		N

Annex I (EN 61347-1)	Additional requirements for built-in magnetic ballasts with double or reinforced insulation	N
Annex J	Schedule of more onerous requirement	N
Annex K	Conformity testing during manufacture	N

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

object/part No.	code	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity
See EN 60598-2-2 ANNEX 4						

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

	Clause 15 Temperature measurements		**P**
	Type reference.....:	RT7.815.B99A 20150606	
	Lamp used.....:	LED	
	Mounting position of luminaire.....:	Normal used	
	Operation: heating test is under at ta condition		P
	- abnormal operating mode .....:	a. No LED modules are connected. b. Double load (Unit shut down immediately) c. The output terminal be short-circuited (Unit shut down immediately)	
	- test 1: 0.9 times rated voltage, 1.1 times rated voltage, ...:	264V	
	- test 2: 1,1 times rated voltage or 1,05 times rated wattage ..... :	--	

Temperature (°C) of part	Normal operation		Abnormal operation			
	Test 1 264V	Limits (°C)	Test 2 a	Test 2 b	Test 2 c	Limit
Input connector	49.6	70	--	--	--	--
Input lead wire	65.9	70	--	--	--	--
Varistor	73.9	85	--	--	--	--
L1 winding	82.8	120	--	--	--	--
T1 winding	91.2	120	--	--	--	--
T1 core	87.3	--	--	--	--	--
PCB near transformer	84.6	130	--	--	--	--
Y capacitor	86.1	125	--	--	--	--
Enclosure outside	60.1	75	--	--	--	--
Note: Measured temperature under abnormal conditions is lower than that under normal condition.						

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

	Clause 15 Temperature measurements		**P**
	Type reference.....:	RT7.815.B86A 20150415	
	Lamp used.....:	LED	
	Mounting position of luminaire.....:	Normal used	
	Operation: heating test is under at ta condition		P
	- abnormal operating mode .....:	a. No LED modules are connected. b. Double load (Unit shut down immediately) c. The output terminal be short-circuited (Unit shut down immediately)	
	- test 1: 0.9 times rated voltage, 1.1 times rated voltage, ...:	264V	
	- test 2: 1,1 times rated voltage or 1,05 times rated wattage ..... :	--	

Temperature (°C) of part	Normal operation		Abnormal operation			
	Test 1 264V	Limits (°C)	Test 2 a	Test 2 b	Test 2 c	Limit
Input connector	51.0	70	--	--	--	--
Input lead wire	67.5	70	--	--	--	--
Varistor	81.4	85	--	--	--	--
L1 winding	82.8	120	--	--	--	--
T1 winding	97.4	120	--	--	--	--
T1 core	92.1	--	--	--	--	--
PCB near transformer	98.7	130	--	--	--	--
Y capacitor	92.1	125	--	--	--	--
Enclosure outside	60.4	75	--	--	--	--
Note: Measured temperature under abnormal conditions is lower than that under normal condition.						

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

	Clause 15 Temperature measurements		**P**
	Type reference.....:	RT7.815.B89A 20150512	
	Lamp used.....:	LED	
	Mounting position of luminaire.....:	Normal used	
	Operation: heating test is under at ta condition		P
	- abnormal operating mode .....:	a. No LED modules are connected. b. Double load (Unit shut down immediately) c. The output terminal be short-circuited (Unit shut down immediately)	
	- test 1: 0.9 times rated voltage, 1.1 times rated voltage, ...:	264V	
	- test 2: 1,1 times rated voltage or 1,05 times rated wattage ..... :	--	

Temperature (°C) of part	Normal operation		Abnormal operation			
	Test 1 264V	Limits (°C)	Test 2 a	Test 2 b	Test 2 c	Limit
Input connector	49.9	70	--	--	--	--
Input lead wire	68.2	70	--	--	--	--
Varistor	77.7	85	--	--	--	--
L1 winding	84.6	120	--	--	--	--
T1 winding	91.4	120	--	--	--	--
T1 core	88.1	--	--	--	--	--
PCB near transformer	92.3	130	--	--	--	--
Y capacitor	78.6	125	--	--	--	--
Enclosure outside	60.0	75	--	--	--	--
Note: Measured temperature under abnormal conditions is lower than that under normal condition.						

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

	Mechanical strength (clause 4.13 of EN 60598-1)		**P**
4.13.1	Impact tests:		P
	- fragile parts; energy (Nm)..... :		N
	- other parts; energy (Nm) ..... :	0.35Nm	P
	1) live parts		P
	2) linings		N
	3) protection		P
	4) covers		P
4.13.3	Straight test finger	30N	P

	EXTERNAL AND INTERNAL WIRING (clause 5 of EN 60598-1)		**P**
5.2	Supply connection and external wiring		P
5.2.1	Means of connection ..... :	Non-detachable flexible cables	P
5.2.2	Type of cable ..... :	H05VV-F	P
	Nominal cross-sectional area (mm²) ..... :	1.0 mm²	P
5.2.3	Type of attachment, X, Y or Z	Type Y	P
5.2.5	Type Z not connected to screws		N
5.2.6	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
5.2.7	Cable entries through rigid material have rounded edges		P
5.2.8	Insulating bushings:		N
	- suitably fixed		N
	- material in bushings		N
	- tubes or guards made of insulating material		N
5.2.9	Locking of screwed bushings		N
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

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	- insulating material or lining		P
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
	Glands not used as anchorage		N
	Labyrinth type anchorages		N
5.2.10.2	Adequate cord anchorage for type Y and type Z attachment		P
5.2.10.3	Tests:		P
	- impossible to push cable; unsafe	80N	P
	- pull test: 25 times; pull (N)..... :	0.35 Nm	P
	- torque test: torque (Nm) ..... :	<1.0mm	P
	- displacement 2 mm		P
	- no movement of conductors		P
	- no damage of cable or cord		P
5.2.11	External wiring passing into luminaire		P
5.2.12	Looping-in terminals		N
5.2.13	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N
5.2.14	Mains plug same protection		P
	Class III luminaire plug		N
5.2.15	Colour code low voltage		N
5.2.16	Appliance inlets (IEC 60320)		N
	Appliance couplers of class II type		N
5.3	Internal wiring		N
5.3.1	Internal wiring of suitable size and type		N
	Through wiring		N
	- not delivered/ mounting instruction		N

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	- factory assembled		N
	- socket outlet loaded (A)..... :		N
	- temperatures ..... :		N
	Green-yellow for earth only		N
5.3.1.1	Internal wiring connected directly to fixed wiring		N
	Cross-sectional area (mm²)..... :		N
	Insulation thickness		N
	Extra insulation added where necessary		N
5.3.1.2	Internal wiring connected to fixed wiring via internal current-limiting device		N
	Adequate cross-sectional area and insulation thickness		N
5.3.1.3	Double or reinforced insulation for class II		N
5.3.1.4	Conductors without insulation		N
5.3.1.5	SELV current-carrying parts		N
5.3.1.6	Insulation thickness other than PVC or rubber		N
5.3.2	Sharp edges etc.		N
	No moving parts of switches etc.		N
	Joints, raising/lowering devices		N
	Telescopic tubes etc.		N
	No twisting over 360		N
5.3.3	Openings		P
	Bushings not removable		P
	Bushings in sharp openings		P
	Cables with protective sheath		P
5.3.4	Joints and junctions effectively insulated		N
5.3.5	Strain on internal wiring		N
5.3.6	Wire carriers		N
5.3.7	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N
	PROTECTION AGAINST ELECTRIC SHOCK (clause 8 of EN 60598-1)		**P**
8.2.1	Live parts not accessible		P
	Protection in any position		P

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Double-ended tungsten filament lamp		N
	Insulation lacquer not reliable		N
	Double-ended high pressure discharge lamp		N
8.2.2	Portable luminaire adjusted in most unfavourable position		N
8.2.3	Class II luminaire:		N
	- basic insulated metal parts not accessible during starter or lamp replacement		N
	- basic insulation not accessible other than during starter or lamp replacement		N
	- glass protective shields not used as supplementary insulation		N
	Class I luminaire with BC lampholder		N
8.2.4	Portable luminaire:		N
	- protection independent of supporting surface		N
	- terminal block completely covered		N
8.2.6	Covers reliably secured		P
8.2.7	Discharging of capacitors 0,5 F		N
	Portable plug connected luminaire with capacitor		N
	Other plug connected luminaire with capacitor		N
	Discharge device on or within capacitor		N
	Discharge device mounted separately		N

EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 6
LED MODULES FOR GENERAL LIGHTING - SAFETY SPECIFICATIONS

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		P
5.5	SELV-operated LED modules comply with Annex I of IEC 61347-2-13		N

6	CLASSIFICATION		P
	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.		P

7	MARKING		N
7.1	Mandatory markings:	Marking in compliance with EN 61347-2-13	N
	- mark of origin		N
	- model number, type reference..... :	--	N
	- Rated voltage/voltage range (V)..... :	--	N
	- rated current/ current range (A)..... :	--	N
	- rated input power (W) ..... :	--	N
	- indication of connections, wiring diagram..... :	--	N
	- value of t_c ..... :	--	N
	- eye protection ..... :	--	N
	- marking of built-in modules only..... :	--	N
7.2	- location of marking..... :	--	N
7.3	Marking durable and legible		N
	Rubbing 15 s water, marking legible		N

8	SCREW TERMINALS	N

EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict
	Compliance with section 14 of IEC 60598-1	No screw terminals.	N
	SCREWLESS TERMINALS		N
	Compliance with section 15 of IEC 60598-1		N
	CONNECTORS		N
	Compliance with IEC 60838-2-2		N
9	**PROVISION FOR PROTECTIVE EARTHING**		**P**
	External metal parts connected to the earth terminal:		P
	- compliance with 7.2.1 in IEC 60598-1		P
	Test with a current of 10 A between earthing terminal and each of the accessible metal parts; measured resistance (Ω): < 0,5 Ω ..... :	See EN 61347-2-13	P
	Protective earth, symbol		P
	Terminal complying with clause 8 in Part 1		P
	Locked against loosening and not possible to loosen by hand		P
	Not possible to loosen clamping means unintentionally on screwless terminals		P
	Earthing via means of fixing		P
	Earthing terminal only used for the earthing of the control gear		P
	All parts of material minimizing the danger of electrolytic corrosion		P
	Made of brass or equivalent material		P
	Contact surface bare metal		P
	Conductors by tracks on printed circuit boards:		P
	- a.c. current of 25 A for 1 min between earthing terminal and accessible metal parts		P
	- compliance with clause 7.2.1 in IEC 60598-1		P
8 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		**P**
	Protection against accidental contact with live parts in compliance with IEC 61347-1 and IEC 61347-2-13 (clause numbers between parentheses refer to IEC 61347-1 and IEC 61347-2-13)		P
- (10.1)	Controlgear protected against accidental contact with live parts		P

EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict
- (A1)	Current measured according to IEC 60990, figure 4 and clause 7.1: max. 0,7 mA (peak) or 2,0 mA d.c., for f 1000 Hz max. 70 mA ..... :	See EN 61347-2-13	P
- (A2)	Voltage at 50 kΩ (V): max. 34 V (peak)..... :	--	N
	Lacquer or enamel not used for protection or insulation		N
	Adequate mechanical strength on parts providing protection		N
- (10.2)	Capacitors > 0,5 µF: voltage after 1 min (V): < 50 V :	No accessible terminations.	N
8.1 (-)	SELV-equivalent controlgear accessible parts are insulated from live parts by double or reinforced insulation according 8.6 and 13.1 in IEC 60065	Double or reinforced insulation for live parts to accessible parts.	P
8.2 (-)	Exposed terminals of SELV or SELV-equivalent controlgear are allowed if: - the rated or maximum output voltage does not exceeding 25 V r.m.s. - the no-load output voltage does not exceed 30 V r.m.s. or 33 √2 V peak		N
	Insulated terminals if rated output voltage >25 V		N
	One capacitor Y1 or two capacitors Y2 of the same values used in series between SELV or SELV-equivalent output and primary circuits - Capacitor complying with IEC 60384-14 - Other components bridging the separating transformer complying with EN 60065, clause 14		N

11	**MOISTURE RESISTANCE AND INSULATION**		**P**
	Moisture and insulation in compliance with Clause 11, IEC 61347-1		P
	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance with d.c. 500 V (MΩ): ≥ 2 MΩ ..... :	See EN 61347-2-13	P
	Adequate insulation between input and output terminals not bounded together in SELV-equivalent controlgear	See EN 61347-2-13	P
	For double or reinforced insulation the resistance exceeds ≥ 4 MΩ	See EN 61347-2-13	P

12	**ELECTRIC STRENGTH**		**P**
	Electric strength in compliance with Clause 12 of IEC 61347-1		P
	Immediately after clause 11 electric strength test for 1 min	See EN 61347-2-13	P
	Working voltage ≤ 42 V, test voltage 500 V		N

EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict
	Working voltage > 42 V, test voltage (V): 2U + 1000 V..... :	See EN 61347-2-13	P
	Reinforced insulation, test voltage (V)..... :	See EN 61347-2-13	P
	No flashover or breakdown		P
	Windings in separating transformers in SELV-equivalent control gear according to 14.3.2 of EN 60065		N
13	**FAULT CONDITIONS**		**P**
13.1	Fault conditions in compliance with IEC 61347-1 (clause numbers between parentheses refer to IEC 61347-1)		P
	When operated under fault conditions the LED-module:	See EN 61347-2-13	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		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
	Distances on printed boards provided with coating according to IEC 60664		N
- (14.2)	Short-circuit or interruption of semiconductor devices		P
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile		N
- (14.4)	Short-circuit across electrolytic capacitors		P
- (14.5)	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P
	After the tests the insulation resistance with d.c. 500 V (MΩ) are ≥ 1 MΩ..... :	See EN 61347-2-13	P
	Temperature declared thermally protected LED-modules fulfil the requirements in Annex C of IEC 61437-1		N
13.2	Module withstands overpower condition > 15 min.		P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		N

EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict
	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
	Class of protection ..... :	Class I	--
	Working voltage (V) ..... :	AC 100-240	--
	Voltage form..... :	☒ Sinusoidal ☐ Non-sinusoidal	--
	PTI..... :	☒ < 600 ☐ > 600	--
	Rated pulse voltage (kV) ..... :	--	--
	(1) Live parts of different polarity: cr (mm); cl (mm).. :	See EN 61347-2-13	P
	(2) Live parts and accessible parts: cr (mm); cl (mm)..... :	See EN 61347-2-13	P
	(3) Parts becoming live: cr (mm); cl (mm) ..... :	--	N
	(4) Outer surface of cable: cr (mm); cl (mm) ..... :	--	N
	(5) Live parts of switches: cr (mm); cl (mm) ..... :	--	N
	(6) Live parts and supporting surface: cr (mm); cl (mm)..... :	See EN 61347-2-13	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
(4.11)	Electrical connections:		P
(4.11.1)	Contact pressure		N
(4.11.2)	Screws:		N
	- self-tapping screws		N
	- thread-cutting screws		N
	- at least two self-tapping screws		N
(4.11.3)	Screw locking:		N
	- spring washer		N
	- rivets		N
(4.11.4)	Material of current-carrying parts		P

EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict
(4.11.5)	No contact to wood		P
(4.12)	Mechanical connections and glands:		N
(4.12.1)	Mechanical stress		N
	Screws not made of soft metal		N
	Screws of insulating material		N
	Torque test: part; torque (Nm) ..... :	--	N
	Torque test: part; torque (Nm) ..... :	--	N
	Torque test: part; torque (Nm) ..... :	--	N
(4.12.2)	Screw diameter < 3 mm screwed into metal		N
(4.12.3)	Void		N
(4.12.4)	Locked connections		N
(4.12.5)	Screwed glands: force (N) ..... :	--	N
18 (18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		**P**
	Resistance to Heat, Fire and Tracking in compliance with IEC 61347-1 (clause numbers between parentheses refer to IEC 61347-1)		P
(18.1)	Parts of insulating material retaining live parts in position, ball-pressure test:	See EN 61347-2-13	P
	- part; test temperature (°C)..... :	See EN 61347-2-13	P
(18.2)	Printed boards in accordance with IEC 60249-1, 4.3		P
(18.3)	External parts of insulating material preventing electric shock glow-wire test 650 °C	See EN 61347-2-13	P
(18.4)	Parts of insulating material retaining live parts in position, needle-flame test 10 s:		P
	- flame extinguished within 30 s		P
	- no flaming drops igniting tissue paper		P
(18.5)	Tracking test		N
19	**RESISTANCE TO CORROSION**		**N**
	Resistance to corrosion in compliance with IEC 61347-1		N
	Rust protection:	No ferrous part.	N
	- test according 4.18.1 of IEC 60598-1		N
	- adequate varnish on the outer surface		N
A	**ANNEX A - TESTS**		**P**
	All tests performed in accordance with the advise given in Annex H of IEC 61347-1, if applicable		P

EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict

B	**ANNEX B - SELV-operated LED modules**	**N**
	ANNEX I of IEC 61347-2-13 - PARTICULAR ADDITIONAL REQUIREMENTS FOR INDEPENDENT SELV D.C. OR A.C. SUPPLIED ELECTRONIC STEP-DOWN CONVERTORS FOR FILAMENT LAMPS See EN 61347-2-13	N

14	**TABLE: tests of fault conditions**	
Part	**Simulated fault**	**Hazard**
--	--	--

EN 62471			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 7
PHOTOBIOLOGICAL SAFETY OF LAMPS AND LAMP SYSTEMS

TABLE: Emission limits for risk groups of continuous wave lamps										**P**
Lamp classification group..... :	☒ **Exempt**	☐ **risk 1**	☐ **risk 2**	☐ **risk 3**						
Risk	**Action spectrum**	**Symbol**	**Units**	**Emission Measurement**						
				Exempt		**Low risk**		**Mod risk**		
				Result	**Limit**	**Result**	**Limit**	**Result**	**Limit**	
Actinic UV	$S_{UV}(\lambda)$	E_S	$W \cdot m^{-2}$	5.7×10^{-5}	0.001	--	0.003	--	0.03	
Near UV	--	E_{UVA}	$W \cdot m^{-2}$	0	10	--	33	--	100	
Blue light	B(λ)	L_B	$W \cdot m^{-2} \cdot sr^{-1}$	1.9	100	--	10000	--	4000000	
Bluelight, small source	B(λ)	L_B	$W \cdot m^{-2}$	--	1.0*	--	1.0	--	400	
Retinal thermal	B(λ)	L_R	$W \cdot m^{-2} \cdot sr^{-1}$	11.4	28000/α	--	28000/α	--	71000/α	
Retinal thermal, weak visual stimulus**	B(λ)	L_{IR}	$W \cdot m^{-2} \cdot sr^{-1}$	--	6000/α	--	6000/α	--	6000/α	
IR radiation, eye	--	E_{IR}	$W \cdot m^{-2}$	0	100	--	570	--	3200	

Remarks:

* Small source defined as one with α<0.011 radian. Averaging field of view at 10000 s is 0.1 radian.

** Involves evaluation of non-GLS source.

EN 62493			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 8
ASSESSMENT OF LIGHTING EQUIPMENT RELATED TO HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

TABLE: measuring result for exposure to electromagnetic fields		**P**
Measuring distance(cm): ..... :	30	
Measuring value (F)	**Limit value (F)**	**Result**
0.13	0.85	P

Remarks:

The measured induced current density due to the electric field in the frequency range 20 kHz to 10 MHz. Other disturbance test is given in the relevant EMC report.

ANNEX 9

Photo document

Photo 1 (5RS015-1, 5RS015-2, 5RS015-3, 5RS015-4, 5RS015-5)

Photo 2 (5RS015-1, 5RS015-2, 5RS015-3, 5RS015-4, 5RS015-5)

Photo document

Photo 3 (5RS015-1, 5RS015-2, 5RS015-3, 5RS015-4, 5RS015-5)

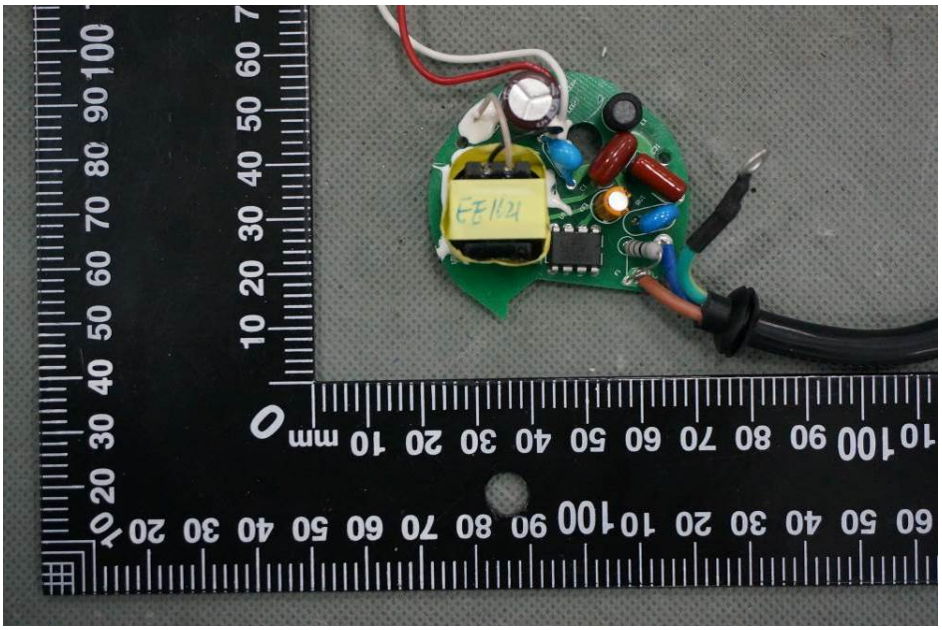

Photo 4 (RT7.815.B99A 20150606)

Photo document

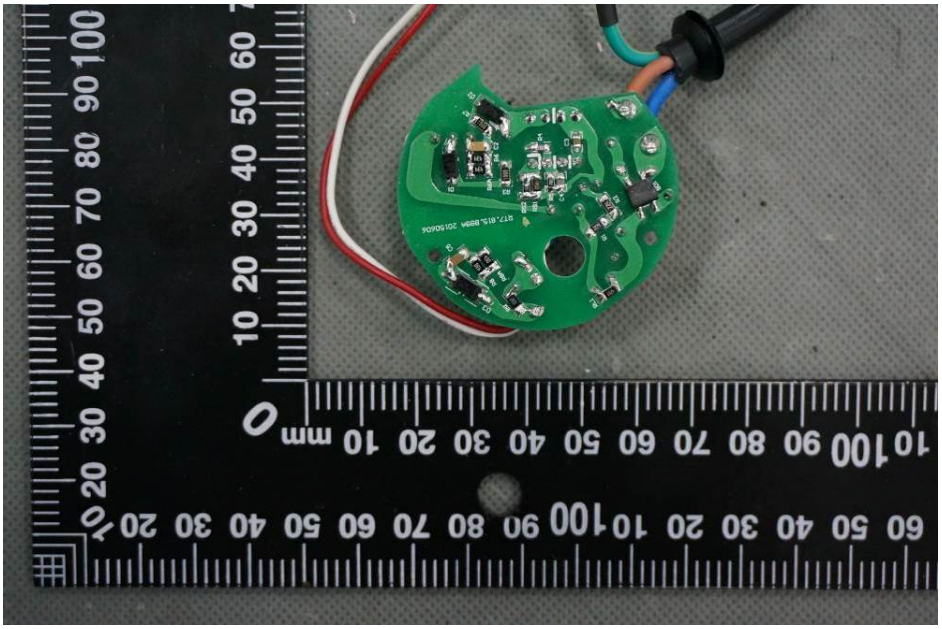

Photo 5 (RT7.815.B99A 20150606)

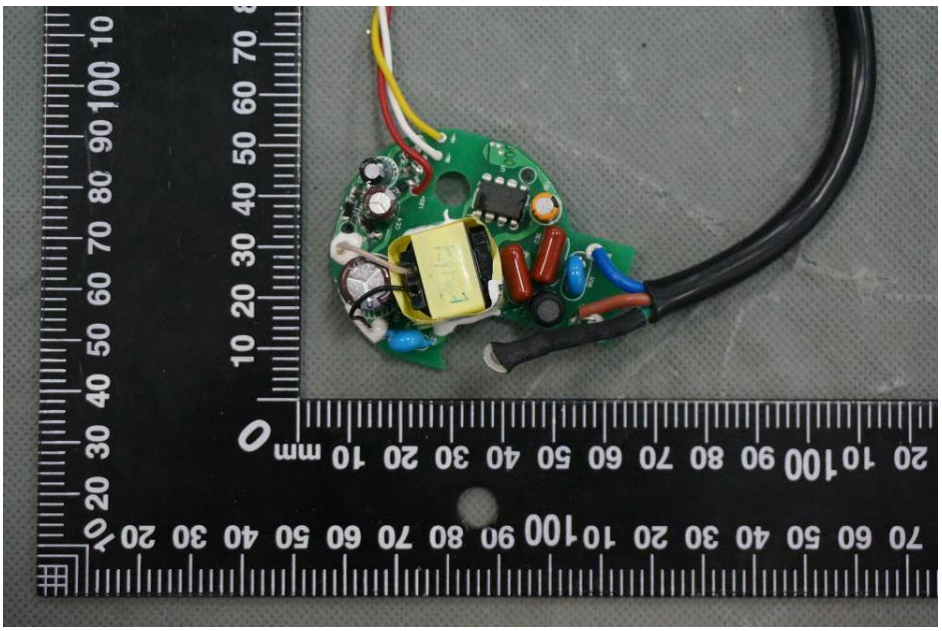

Photo 6 (RT7.815.B91A 20150513)

Photo document

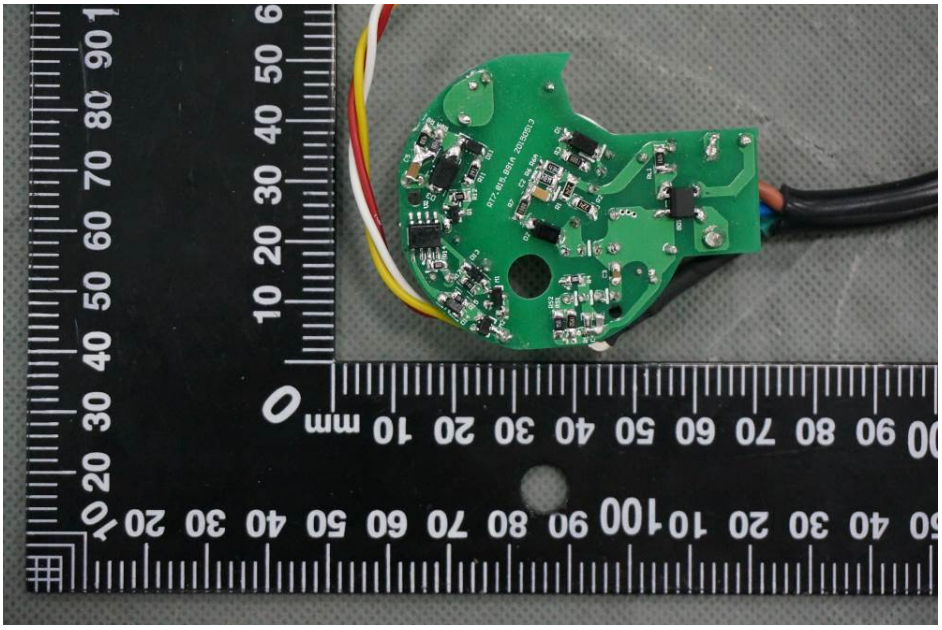

Photo 7 (RT7.815.B91A 20150513)

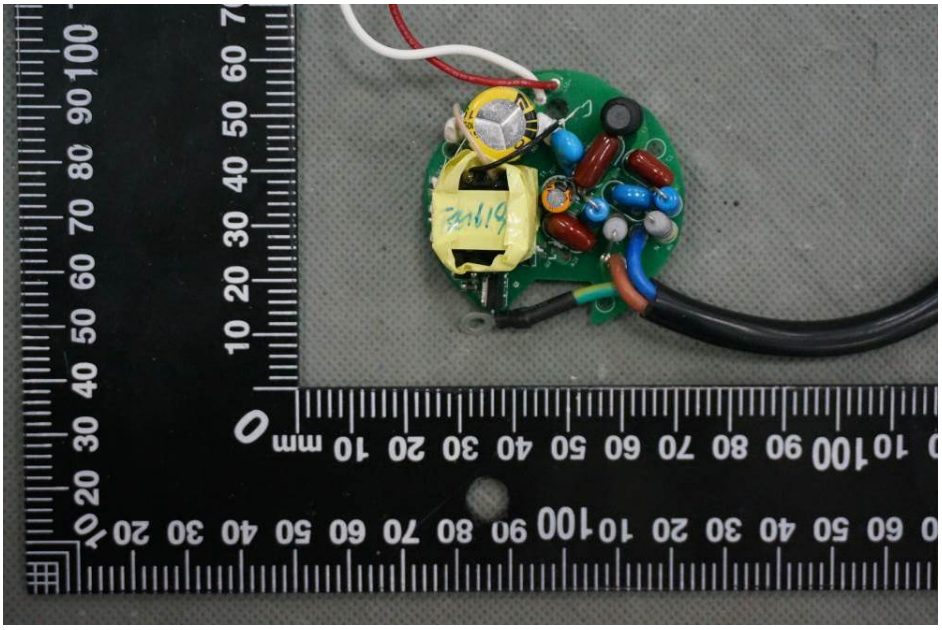

Photo 8 (RT7.815.B86A 20150415)

Photo document

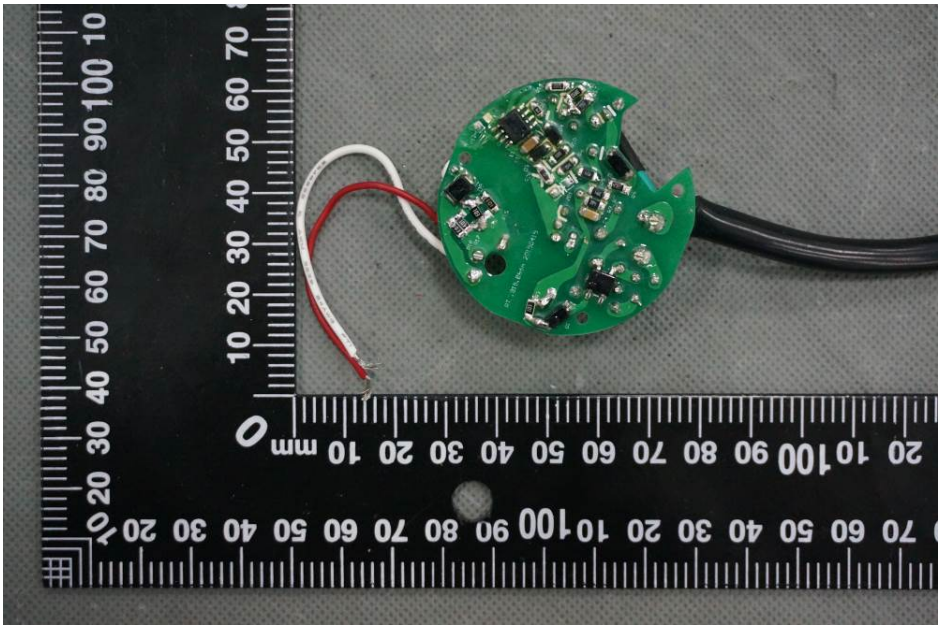

Photo 9 (RT7.815.B86A 20150415)

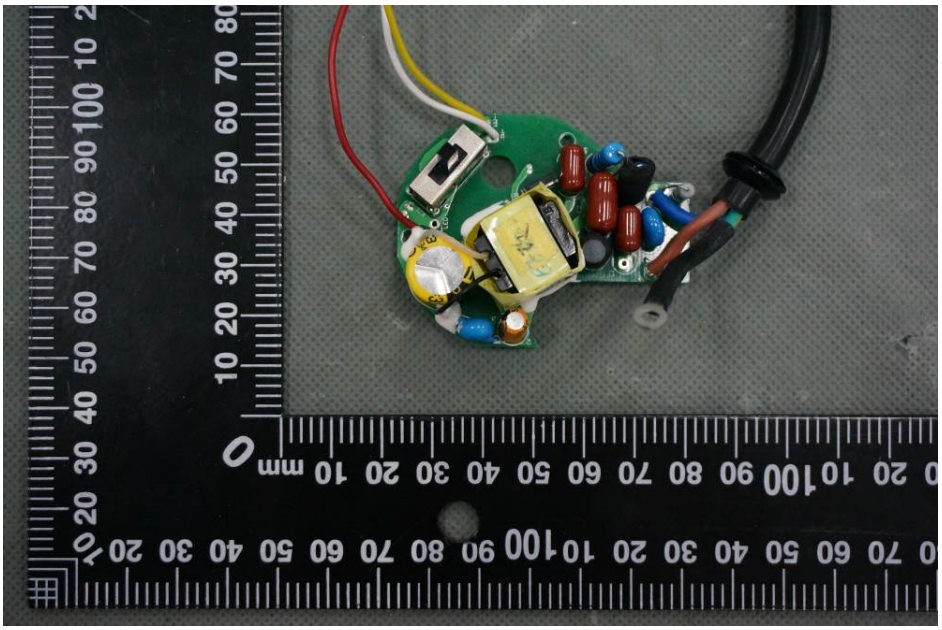

Photo 10 (RT7.815.B92A 20150520)

Photo document

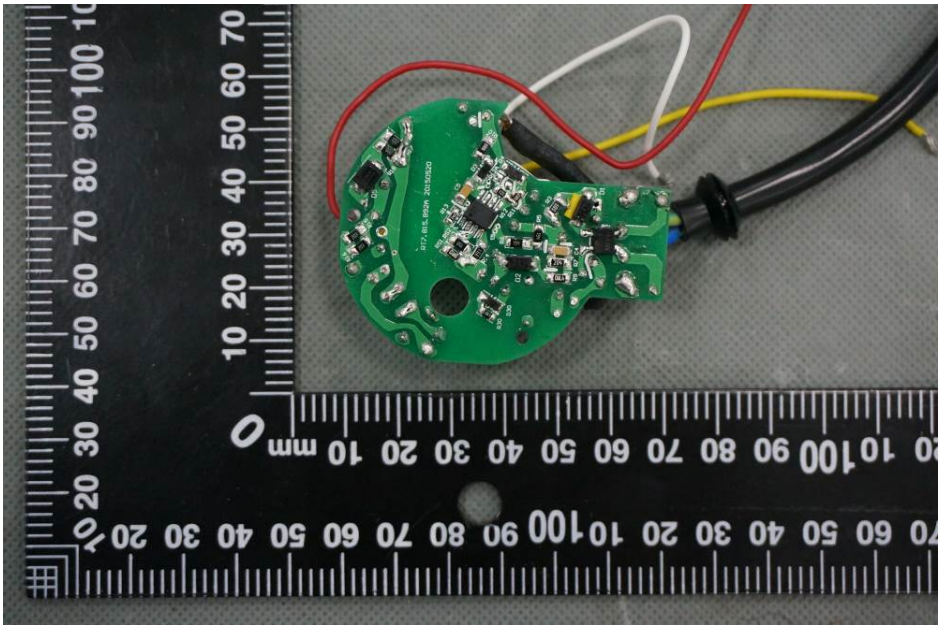

Photo 11 (RT7.815.B92A 20150520)

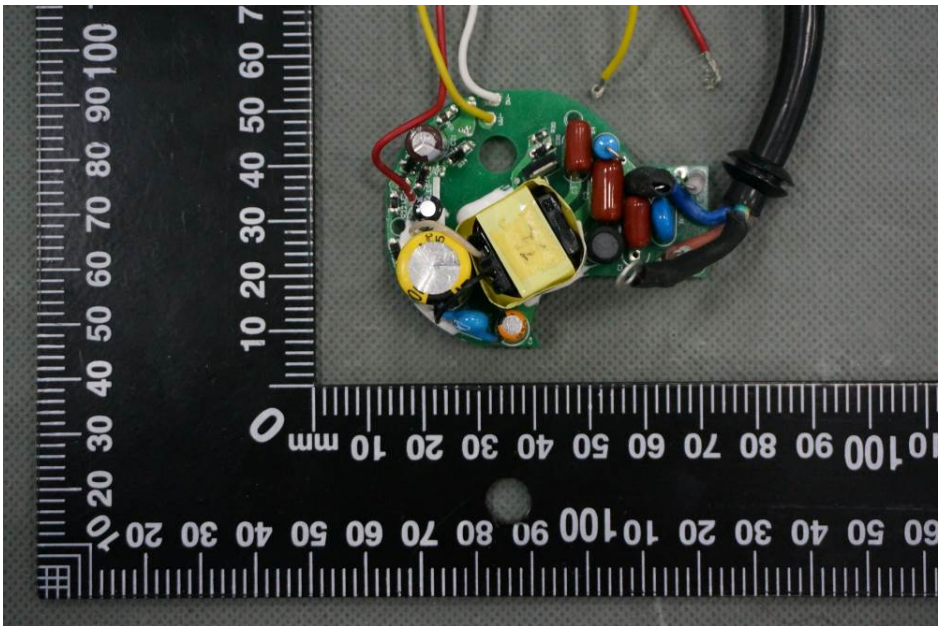

Photo 12 (RT7.815.B89A 20150512)

Photo document

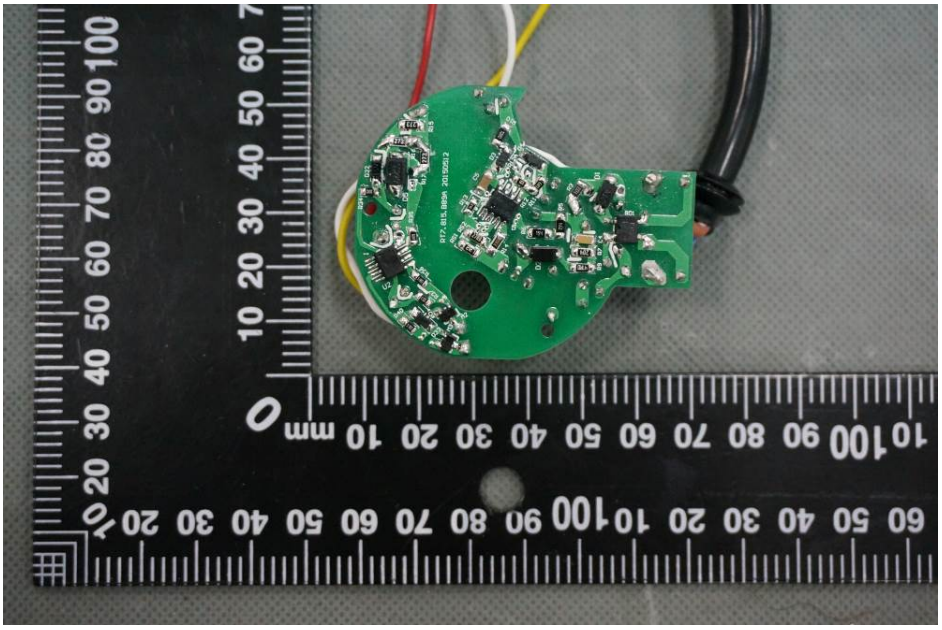

Photo 13 (RT7.815.B89A 20150512)