



卓時檢測
TIMEWAY TESTING LABORATORY



ISO/IEC17025 Accredited Lab.

Report No: LVD0911292
File reference No: 2009-12-30

Applicant: Shenzhen Ruizi Light Science & Technology Co.,Ltd

Product: LED TUBE

Model No: PC01,PC02

Brand Name: ERVAN

Test Standards: EN 60598-1:2004+A1:2006
EN 60598-2-2:1996+A1:1997
EN 61347-1:2008
EN 61347-2-13:2006

Test result: The safety testing has been performed on the submitted samples and found in compliance with the council LVD directive 2006/95/EC.

Approved By

White Liu

Manager

Dated: December 30, 2009.

Results appearing herein relate only to the sample tested

The technical reports is issued errors and omissions exempt and is subject to withdrawal at

TIMEWAY TECHNOLOGY DEVELOPMENT LIMITED(HONG KONG)

Rm. 1803, King Centre, No.23 Dundas Street, Mongkok, Kln. HONG KONG

Tel (852)2626 1885

Fax (852)3012 1422

EN 60598-1:2004+A1:2006 EN60598-2-2:1996+A1:1997 EN61347-1:2008 EN61347-2-13:2006			
CL.	Requirement of the test	Result--Remark	Verdict

Special statement:

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meets with ISO/IEC 17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

CNAS-LAB Code: L2292

The Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of testing Laboratories.

EN 60598-1:2004+A1:2006 EN60598-2-2:1996+A1:1997 EN61347-1:2008 EN61347-2-13:2006			
CL.	Requirement of the test	Result--Remark	Verdict


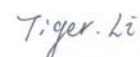
TEST REPORT

EN 60598-2-2:1996+A1:1997

Part 2: Particular requirements-section2 : Recessed luminaires

EN 61347-2-13:2006

Part 2: Particular requirements for a.c. or d.c. supplied Electronic controlgear for LED modules

Report reference No.....:	LVD0911292
Complied by (+signature).....:	Ivan Liu 
Approved by (+signature).....:	Tiger Li 
Date of issue.....:	2009-12-30
Testing Laboratory.....:	TIMEWAY TECHNOLOGY DEVELOPMENT LIMITED(HONG KONG)
Address.....:	Rm. 1803, King Centre, No.23 Dundas Street, Mongkok, Kln. HONG KONG
Testing Location.....:	Timeway Lab
All tests are performed at.....:	Shenzhen Timeway Technology Consulting Co., Ltd.
Address.....:	East 5/block 4, Anhua Industrial Zone, No.8 Tairan Rd. Chegongmiao, Futian District, Shenzhen China
Applicant.....:	Shenzhen Ruizi Light Science & Technology Co.Ltd
Address.....:	6F,Building A,No.8,East of Shangxue Technogy Zone, Bantian Street Office,Longgang District,Shenzhen, China
Standard.....:	EN60598-1:2004+A1:2006,EN60598-2-2:1996+A1:1997,EN61347-1:2008 EN 61347-2-13:2006
Test procedure.....:	LVD
Non_ standard test method.....:	N/A
Name of test object.....:	LED TUBE
Rating.....:	Input:180-240V~, 50Hz, 22W Max size:1.5m
Brand Name.....:	ERVAN
Basic model.....:	PC01
Additional model.....:	PC02
Manufacturer.....:	Shenzhen Ruizi Light Science & Technology Co.,Ltd
Address.....:	6F,Building A,No.8,East of Shangxue Technogy Zone, Bantian Street Office,Longgang District,Shenzhen, China

EN 60598-1:2004+A1:2006 EN60598-2-2:1996+A1:1997 EN61347-1:2008 EN61347-2-13:2006			
CL.	Requirement of the test	Result--Remark	Verdict

Possible test case verdicts:

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

General remark:

The test results presented in this report relate only to the object tested.
 "See remark #" refers to one remark appended to the report.
 "See appended table" reference to a table appended to the report
 This report shall not be reproduced except in full without the written approval of the testing Lab.
 The test report contains two parts, see below please!

Statement:

Shenzhen Ruizi Light Science & Technology Co. Ltd

Statement

We need adding models for CE approval is PC02
 Trade name is _____
 The basic Model No. PC01
 The basic trade name is ERVAN

We hereby state that these models are identical in interior structure, electrical circuits and components, and just model names and appearance color are different for the marketing requirement.

Your assistance on this matter is highly appreciated.

Yours sincerely,

Signature: 
 Company Name: Shenzhen Ruizi Light Science & Technology Co. Ltd



EN 60598-1:2004+A1:2006 EN60598-2-2:1996+A1:1997 EN61347-1:2008 EN61347-2-13:2006			
CL.	Requirement of the test	Result--Remark	Verdict

Label:

ERVAN
www.ervan.cn

CE
 RoHS
 2m

F
 ta..40°C

Voltage: AC100V-120V/60Hz
 AC180V-240V/50Hz

PC01

LED TUBE


Cool white
 Daylight
 Puer white
 Warm white

6W
 12W
 18W
 24W


9W
 15W
 22W
 36W

EN 60598-1:2004+A1:2006 EN60598-2-2:1996+A1:1997 EN61347-1:2008 EN61347-2-13:2006			
CL.	Requirement of the test	Result--Remark	Verdict



Part 1: EN60598-2-2:1996+A1:1997 EN60598-1:2004+A1:2006			
2.1	Scope		P
	Luminaires for use with tungsten filament, tubular fluorescent and other discharge lamps on supply voltages not exceeding 1000V.		P
2.2	General test requirements		P
2.3	Definitions		P

2.4	Classification of luminaires		P
2.4 (2.1)	General		P
2.4 (2.2)	Classification according to type of protection against electric shock		P
	Protection against electric shock as class I, class II or class III	Class II luminaires	P
2.4 (2.3)	Classification according to degree of protection against ingress of dust, solid objects and moisture	IP20	P
2.4 (2.4)	Classification according to material of the mounting surface for which the luminaire is designed		P
2.4 (2.5)	Classification according to the circumstances of use	Luminaires for normal use.	P


2.5	Marking		P
2.5 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text	The height of graphical symbols shall not less than 5mm except that symbols for class II and class III luminaires and for F mark may be reduced to 3mm. The height of letters and numbers shall not less than 2mm.	P
2.5 (3.2.1)	Mark of origin	See label.	P
2.5 (3.2.2)	Rated voltage(s) in volts	180-240V~	P
	Portable class III luminaires shall be marked with the rated		N

EN 60598-1:2004+A1:2006 EN60598-2-2:1996+A1:1997 EN61347-1:2008 EN61347-2-13:2006			
CL.	Requirement of the test	Result--Remark	Verdict
	voltage on the outside of the luminaire		
2.5 (3.2.3)	Rated max. ta, if other than 25 °C	40°C	P
2.5 (3.2.4)	Symbol for class II luminaires		P
2.5 (3.2.5)	Symbol for class III luminaires		N
2.5 (3.2.6)	Marking (if applicable) with IP number		P
	The use of different IP numbers on different parts of a luminaire is only applicable to fixed luminaires.		N
	Marking of IP20 on ordinary luminaires is not required		P
2.5 (3.2.7)	Maker's model number or type reference	See the label	P
2.5 (3.2.8)	Rated wattage or the designation as indicated on the lamp data sheet of the type or types of lamp for which the luminaire is designed.		P
	Where the lamp wattage alone is insufficient, the number of lamps and the type shall also be given.		N
	Luminaires for tungsten filament lamps shall be marked with the maximum rated wattage and number of lamps.		N
2.5 (3.2.9)	the relevant symbol (see Figure 1) for suitability for direct mounting on non-combustible surfaces only; As an alternative, a warning notice may be applied as described by 3.3.4.		N
	the relevant symbol (see Figure 1) for suitability for direct mounting on normally flammable surfaces	see the lable	P
	the relevant symbol (see Figure 1) for suitability for direct mounting in/on normally flammable surfaces where thermally insulating material may cover the luminaire		N
2.5 (3.2.10)	Information concerning special lamp	Not suitable	N
	In particular this applies to the symbols (see Figure 1) for luminaires for use with highpressure sodium lamps		N
2.5 (3.2.11)	Symbol (see Figure 1), if applicable, for luminaires for lamps of similar shape to "cool beam" lamps but where the use of a dichroic reflectorized "cool beam" lamp might impair safety	Not suitable	N
2.5 (3.2.12)	Except for type Z attachments, terminations shall be marked to identify live, neutral and earth in case of connection of the luminaire to the supply mains to ensure safe and satisfactory operation.		N
	The earthing termination shall be marked by the relevant symbol	Class II luminaire	N

EN 60598-1:2004+A1:2006 EN60598-2-2:1996+A1:1997 EN61347-1:2008 EN61347-2-13:2006			
CL.	Requirement of the test	Result--Remark	Verdict
	of IEC 60417 only.		
	Leads (tails) used for the connection to extra low voltage d.c. supply, shall be colour coded red to indicate its intended connection to the positive termination, and shall be colour coded black to indicate its intended connection to the negative termination.		N
	Fixed terminations, when applied, shall be marked with the "+" sign to indicate the positive connection, and shall be marked with the "-" sign to indicate the negative connection		N
	Luminaires with non-detachable flexible cables or cords which are not fitted with a plug shall include with the manufacturers instructions any information necessary to ensure safe connection,		
2.5 (3.2.13)	Symbol for minimum distance from lighted objects	See the lable	P
	The minimum distance marked shall be determined by the temperature test described in item j) of 12.4.1.		N
	The symbol for minimum distance and explanation of its meaning shall also be given either on the luminaire or in the instructions with the luminaire.		N
2.5 (3.2.14)	Symbol for rough service luminaires	No rough service used luminaires	N
2.5 (3.2.15)	Symbol for luminaires with bowl mirror lamp	No bowl mirror lamp used	N
2.5 (3.2.16)	Luminaires with glass protective shield	No such protective shield provided	N
2.5 (3.2.17)	The maximum number of luminaires that may be interconnected or the maximum total current that may be drawn by means of couplers provided for looping-in connection to the mains supply.	Not suitable	N
	For fixed luminaires this information may alternatively be provided within the installation instructions.		N
2.5 (3.2.18)	A warning symbol or notice for luminaires with ignitors intended for use with doubleended high pressure discharge lamps and luminaires with double-capped Fa8 tubular lamps if the voltage measured according to Figure 26 exceeds 34 V peak.	No ignitors used in the EUT	N
	a) Warning symbol in accordance with IEC 60417-5036 (DB:2002-10) visible during replacement of the lamp		N
	b) A warning notice near to the holder of a replaceable ignitor or replaceable switching element,		N
2.5 (3.2.19)	Symbol for luminaires designed for use with self-shielded tungsten halogen lamps only	Not suitable for use the	N

EN 60598-1:2004+A1:2006 EN60598-2-2:1996+A1:1997 EN61347-1:2008 EN61347-2-13:2006			
CL.	Requirement of the test	Result--Remark	Verdict
		 symbol “  ”	
2.5 (3.3)	In addition to the above marking, all details which are necessary to ensure proper installation, use and maintenance shall be given either on the luminaire, semi-luminaire or on built-in ballasts or in the manufacturer's instructions provided with the luminaire,		P
	Written instructions related to safety shall be in a language which is acceptable in the country in which the equipment is to be installed.	English	P
2.5 (3.3.1)	For combination luminaires, the permissible ambient temperature, the class of protection or the protection against ingress of dust, solid objects and moisture of an alternative part if not at least equal to that of the basic luminaire.	Not combination luminaires	N
2.5 (3.3.2)	Nominal frequency in Hz	50Hz	P
2.5 (3.3.3)	Operating temperature:		—
	a) The rated maximum operating temperature (of a winding) t_w in degrees Celsius;		N
	b) The rated maximum operating temperature (of a capacitor) t_c in degrees C		N
	c)The maximum temperature to which the insulation of supply cables and interconnecting cables will be subjected within the luminaire under the most unfavourable conditions of normal operation, if in excess of 90 °C	No such need	N
	Spacing requirements to be observed during installation.	See installation instructions please	P
2.5 (3.3.4)	A warning notice shall be attached to the luminaire or given in the manufacturer's instructions explaining that the luminaire can under no circumstances be mounted on normally flammable surfaces.	No such luminaire	N
	luminaires which are provided with an adaptor for mounting on a track are required to be F-marked as they have to meet the requirements for such luminaires.		N
2.5 (3.3.5)	A wiring diagram, except where the luminaire is suitable for direct connection to the mains supply.	Direct connection to the mains supply	N
2.5 (3.3.6)	Special conditions for which the luminaire, including the ballast, is suitable; for instance, whether or not the luminaire is intended for looping-in.	Not have any special conditions for use	N
2.5	Luminaires provided with metal halide lamps shall, if applicable, be provided with the following warning notice:	No metal halid lamp is	N

EN 60598-1:2004+A1:2006 EN60598-2-2:1996+A1:1997 EN61347-1:2008 EN61347-2-13:2006			
CL.	Requirement of the test	Result--Remark	Verdict
(3.3.7)	“The luminaire shall only be used complete with its protective shield”.	used in the luminaire	
2.5 (3.3.8)	The manufacturer of semi-luminaires shall supply information on limitations of use of such devices,	Not semi-luminaire	N
2.5 (3.3.9)	In addition, the manufacturer shall be prepared to supply information on the power factor and the supply current.	See user manual	P
	For connections suitable for both resistive and inductive loads,		N
2.5 (3.3.10)	Suitability for use indoors	Indoor use only	P
2.5 (3.3.11)	For luminaires using remote control gear, the range of lamps for which the luminaire is designed	No remote control provided	N
2.5 (3.3.12)	For clip-mounted luminaires a warning when the luminaire is not suitable for mounting on tubular material	Not clip-mounted luminaire	N
2.5 (3.3.13)	The manufacturer shall provide the specifications of all protective shields.	Not have any protective shield provided	N
2.5 (3.3.14)	Symbol for nature of supply	~	P
2.5 (3.3.15)	The rated current at rated voltage shall be declared by the manufacturer for any socket outlet incorporated in the luminaire, if less than the rated value.	Not have any socket outlet	N
2.5 (3.3.16)	The information about rough service luminaires	Not rough service luminaire	N
	– the connection to IPX4 rated socket outlets;		N
	– the correct mounting taking into account the temporary installation;		N
	– the correct fixing to a stand, and also where the stand is not supplied with the luminaire, the maximum height of a possible stand, and its required stability by the indication of the number and minimum length of the legs.		N
2.5 (3.3.17)	For type X attachments having a specially prepared cord:	Not contain external flexible cable or cord	N
	For type Y attachments:		N
	For type Z attachments:		N
2.5 (3.3.18)	Luminaires which are other than ordinary, provided with a PVC non-detachable cable or cord, shall be provided with information about the intended use, i.e. ‘For indoor use only’	Not non-ordinary	N
2.5 (3.3.101)	Where the terminal block is not supplied with the luminaire		N
2.5 (3.4)	Test with water 15s		P

EN 60598-1:2004+A1:2006 EN60598-2-2:1996+A1:1997 EN61347-1:2008 EN61347-2-13:2006			
CL.	Requirement of the test	Result--Remark	Verdict
	Test with hexane 15s		P
	Legible after test		P
	Inspection after the tests detailed in section 12		P
2.5.1	Insulating ceiling F mark, symbol 	Not suitable for this subclause, necessary instructions is contained in the user instructions	N

2.6	Construction		P
2.6(4.1)	General		P
2.6 (4.2)	Components replaceable without difficulty		P
2.6 (4.3)	Wireways smooth and free from sharp edges		P
2.6 (4.4)	Lampholders	No lampholder provided	N
2.6 (4.4.1)	Integral lampholder		N
2.6 (4.4.2)	Wiring connection		N
2.6 (4.4.3)	Lampholder for end-to-end mounting		N
2.6 (4.4.4)	Lampholders which are put into position by the user shall be capable of easy and correct positioning.		N
2.6 (4.4.5)	For luminaires with ignitors, the peak pulse voltage occurring across contacts in the lampholders which are part of the pulse voltage circuit shall not be greater than the pulse the voltage marked on the lampholder.		N
2.6 (4.4.6)	For luminaires with ignitors incorporating Edison screw lampholders, the centre contact of the lampholder shall be connected to the lead which supplies the pulse voltage.		N
2.6 (4.4.7)	The insulating parts of lampholders and plugs incorporated in rough service luminaires shall be of a material resistant to tracking.		N
2.6 (4.4.8)	Lamp connectors		N
2.6 (4.4.9)	Caps or bases originally developed for single-capped ELV lamps shall not be used in the luminaires intended for use with general purpose tungsten halogen lamps with rated voltages higher than 50V.		N

EN 60598-1:2004+A1:2006 EN60598-2-2:1996+A1:1997 EN61347-1:2008 EN61347-2-13:2006			
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2.6 (4.5)	Starter holders	No starter is used in this luminaire.	N
	Starter holder in luminaires other than class II		N
	Starter holder class II construction		N
2.6 (4.6)	Terminals blocks	No terminal blocks	N
2.6 (4.7)	Terminals and supply connections		N
2.6 (4.7.1)	Adequate precautions shall be taken to prevent metal parts from becoming live due to a detached wire or screw.		N
2.6 (4.7.2)	Test 8 mm live conductor		N
	Test 8 mm earth conductor		N
	Terminals for supply conductors		N
2.6 (4.7.4)	Terminals other than supply connection		N
2.6 (4.7.5)	Heat-resistant wiring/sleeves	No need.	N
2.6 (4.7.6)	Multi-pole plug		N
2.6 (4.8)	Switches	No switches in this luminaire.	N
	- adequate rating		N
	- adequate fixing		N
	- polarized supply		N
2.6 (4.9)	Insulating lining and sleeves		P
2.6 (4.9.1)	Retainment		P
	Method of fixing		P
2.6 (4.9.2)	Insulated linings and sleeves	Certificated by UL	P
	a) & c) Insulation resistance and electric strength		N
	b) Ageing test. Temperature (°C)		N
2.6 (4.10)	Insulation of Class II luminaires		P
2.6 (4.10.1)	No contact, mounting surface - accessible metal parts - wiring of basic insulation		P
	Safe installation fixed luminaires		P

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	Capacitors		P
	Interference suppression capacitors according to IEC 60384-14	Certificated according to IEC60384-14	P
2.6 (4.10.2)	Assembly gaps:		N
	-not coincidental		N
	-no straight access with test probe		N
2.6 (4.10.3)	Retainment of insulation		P
	- fixed		P
	- unable to be replaced; luminaire inoperative		P
	- sleeves retained in position		P
	- lining in lampholder		N
2.6 (4.11)	Electrical connections		P
2.6 (4.11.1)	Contact pressure		P
2.6 (4.11.2)	Screws:		N
	- self-tapping screws		N
	- thread-cutting screws		N
	- at least two self-tapping screws		N
2.6 (4.11.3)	Screw locking:		N
	- spring washer		N
	- rivets		N
2.6 (4.11.4)	Material of current-carrying parts		P
2.6 (4.11.5)	No contact to wood		P
2.6 (4.11.6)	Electro-mechanical contact systems	No electro-mechanical contact system	N
2.6 (4.12)	Screws and connections (mechanical) and glands		N
2.6 (4.12.1)	Screws not made of soft metal		N
	Screws of insulating material		N

EN 60598-1:2004+A1:2006 EN60598-2-2:1996+A1:1997 EN61347-1:2008 EN61347-2-13:2006			
CL.	Requirement of the test	Result--Remark	Verdict
	Torque test: torque (Nm); part.....:		N
2.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N
2.6 (4.12.4)	Locked connections:		N
	- fixed arms; torque (Nm)		N
	- lampholder; torque (Nm)		N
	- push-button switches; torque 0,8 Nm		N
2.6 (4.12.5)	Screwed glands; force (N).....:		N
2.6 (4.13)	Mechanical strength		P
2.6 (4.13.1)	Impact tests:		P
	Parts (other than ceramic) providing protection against electric shock	0.35Nm	P
	Ceramic parts and all other parts of the luminaires		P
2.6 (4.13.2)	Metal parts enclosing live parts shall have adequate mechanical strength		N
2.6 (4.13.3)	Straight test finger		N
2.6 (4.13.4)	Rough service luminaires	No rough service luminaries.	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
2.6 (4.13.5)	Not used		--
2.6 (4.13.6)	Tumbling barrel		N
2.6 (4.14)	Suspensions and adjusting devices	Fix luminaire	N
2.6 (4.14.1)	Mechanical load:		N
	A) four times the weight		N
	B) torque 2,5 Nm		N

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CL.	Requirement of the test	Result--Remark	Verdict
	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
2.6 (4.14.2)	Load to flexible cables		N
	Mass (kg)		N
	Stress in conductors (N/mm ²)		N
	Mass (kg) of semi-luminaire		N
	Bending moment (Nm) of semi-luminaire		N
2.6 (4.14.3)	Adjusting devices:		N
	- flexing test; number of cycles.....:		N
	- strands broken		N
	- electric strength test afterwards		N
2.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N
2.6 (4.14.5)	Guide pulleys		N
2.6 (4.14.6)	Strain on socket-outlets		N
2.6 (4.15)	Flammable materials:		P
	- glow-wire test 650 °C	Enclosure	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
2.6 (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

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CL.	Requirement of the test	Result--Remark	Verdict
2.6 (4.16)	Luminaires marked with F-symbol		P
2.6 (4.16.1)	Lamp control gear spacing:		P
	- spacing 35 mm		P
	- spacing 10 mm		P
2.6 (4.16.2)	Thermal protection:		N
	- in lamp control gear		N
	- external		N
	- fixed position		N
	- temperature marked lamp control gear		N
2.6 (4.16.3)	"F" curve measured		N
2.6 (4.17)	Drain holes	No such instruction.	N
	Clearance at least 5 mm		N
2.6 (4.18)	Resistance to corrosion:	No parts corroded can influence the safety	N
2.6 (4.18.1)	- rust resistance		N
2.6 (4.18.2)	- season cracking in copper		N
2.6 (4.18.3)	- corrosion of aluminium		N
2.6 (4.19)	Ignitors compatible with ballast	No ignitors in the ballast.	N
2.6 (4.20)	Rough service vibration	No rough service luminaires.	N
2.6 (4.21)	Protective shield:	No tungsten halogen lamps are used in this luminaires.	N
2.6 (4.21.1)	Shield fitted		N
2.6 (4.21.2)	Particles from a shattering lamp not impair safety		N
2.6 (4.21.3)	No direct path		N

EN 60598-1:2004+A1:2006 EN60598-2-2:1996+A1:1997 EN61347-1:2008 EN61347-2-13:2006			
CL.	Requirement of the test	Result--Remark	Verdict
2.6 (4.21.4)	Impact test on shield		N
	Glow-wire test on lamp compartment		N
2.6 (4.22)	Attachments to lamps	No lamp attachments	N
2.6 (4.23)	Semi-luminaires comply Class II	No semi-luminaires	N
2.6 (4.24)	UV radiation, metal halide lamps		N
2.6 (4.25)	No sharp point or edges		P
2.6 (4.26)	Short circuit protection:		N
2.6 (4.26.1)	Uninsulated accessible SELV parts		N
2.6 (4.26.2)	Short-circuit test		N
2.6 (4.26.3)	Test chain		N
2.7 (11)	CREEPAGE DISTANCES AND CLEARANCES		P
	This section specifies minimum requirements for creepage distances and clearances in luminaires.		P
	Working voltage (V).....:	240V	P
	Voltage form	~	P
	PTI	<600	P
	Rated pulse voltage (KV).....:		N
	(1) Current-carrying parts of different polarity: cr (mm); cl (mm):		P
	(2) Current-carrying parts and accessible parts: cr (mm); cl (mm):	Current-carrying parts and enclosure:>7.5mm	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 clamped and metal parts: cr (mm); cl (mm).....:		N
	(5) Current-carrying parts of switches and metal parts, after removal of insulation: Cr (mm); cl (mm).....:		N
	(6) current-carrying parts and supporting surface: cr (mm); cl (mm).....:	PCB and pastic enclosure:>6.5	P
2.8 (7)	PROVISION FOR EARTHING		N

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CL.	Requirement of the test	Result--Remark	Verdict
2.8 (7.2.1 7.2.3)	Accessible metal parts	Class II Luminaires	N
	Metal parts in contact with supporting surface		N
	Resistance < 0.5Ω		N
	Two self-tapping screws used		N
	Thread-forming screws		N
	Connector earthing first		N
2.8 (7.2.2)	Surfaces in adjustable joints, telescopic tubes, etc., providing earthing continuity, shall be such that a good electrical contact is ensured.		N
(7.2.3)	Compliance with the requirements of 7.2.1 and 7.2.2 is checked.		N
2.8 (7.2.4)	Earthing terminals shall comply with the requirements of 4.7.3. The connection shall be adequately locked against accidental loosening.		N
2.8 (7.2.5)	For a luminaire provided with a connector socket for a mains supply, the earth contact shall be an integral part of the socket.		N
2.8 (7.2.6)	For a luminaire to be connected to supply cables or to supply cables or to a non-detachable flexible cable or cord, the earth terminal shall be adjacent to the mains terminal.		N
2.8 (7.2.7)	For luminaires other than ordinary luminaires, all parts of an earth terminal shall be such as to minimize the danger of electrolytic corrosion resulting from contact with the earth conductor or any other metal in contact with them.		N
2.8 (7.2.8)	Material of earth terminal		N
	Contact surface bare metal		N
2.8 (7.2.10)	Class II luminaire for looping-in		N
2.8 (7.2.11)	Earthing core coloured green-yellow		N
	Length of earth conductor		N

2.9 (14)	SCREW TERMINALS		N
2.9 (14.1)	General	No screw terminals	N
2.9 (14.2)	Definitions		N
2.9 (14.3)	General requirements and basic principles		N

CL.	Requirement of the test	Result--Remark	Verdict
2.9 (14.4)	Mechanical tests		N
2.9 (15)	Screwless terminals and electrical connections		N
2.9 (15.1)	General		N
2.9 (15.2)	Definitions—Screwless terminals		N
2.9 (15.3)	General requiremnets		N
2.9 (15.4)	General instructions on tests		N
2.9 (15.5)	Terminals and connections for internal wiring		N
2.9 (15.6)	Electrical test		N
2.9 (15.7)	Terminals and connections for external wiring		N
2.9 (15.8)	Mechanical Tests		N
2.9 (15.9)	Electrical tests		N

2.10 (5)	EXTERNAL AND INTERNAL WIRING		P
2.10 (5.2)	Supply connection and external wiring		P
2.10 (5.2.1)	Means of connection.....:	Pulg for engagement with socket-outlets	P
2.10 (5.2.2)	Type of cable.....:		N
	Nominal cross-sectional area (mm ²).....:		N
2.10 (5.2.3)	Type of attachment, X,Y or Z		N
2.10 (5.2.5)	Type Z not connected to screws		N
2.10 (5.2.6)	Cable entries:		N
	-- suitable for introduction		N
	-- adequate degree of protection		N
2.10 (5.2.7)	Cable entries through rigid material have rounded edages		N
2.10 (5.2.8)	Insulating bushings:		N
	-- suitably fixed		N
	-- material in bushings		N

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CL.	Requirement of the test	Result--Remark	Verdict
	-- tubes or guards made of insulating material		N
2.10 (5.2.9)	Locking of screwed bushings		N
2.10 (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
2.10 (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
	Glands not used as anchorage		N
	Labyrinth type anchorages		N
2.10 (5.2, 10.2)	Adequate cord anchorage for type Y and type Z attachment		N
2.10 (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
2.10 (5.2.11)	External wiring passing into luminaire		N

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CL.	Requirement of the test	Result--Remark	Verdict
2.10 (5.2.12)	Fixed luminaires for looping-in shall be provided with terminals intended for maintaining the electrical continuity of supply cables feeding the luminaire, but not terminating in it.		N
2.10 (5.2.13)	The ends of flexible stranded conductors may be tinned but shall not have additional solder applied, unless a means is provided of ensuring that clamped connections cannot work loose owing to cold flow of the solder.		N
	Wire ends tinned: no cold flow		N
2.10 (5.2.14)	Mains plug same protection	No such plug provided.	N
	Class III luminaire plug		N
2.10 (5.2.15)	Void		--
2.10 (5.2.16)	Appliance inlet (IEC 60320)		N
	Appliance couplers of class II type		N
2.10 (5.3)	Internal wiring		P
2.10 (5.3.1)	Cross-sectional area (mm ²).....:	>0.5mm	P
	Insulation thickness	>0.6mm	P
	Temperature resistant	25°C	P
	Sleeves suitable for hot spots		P
	Green-yellow for earth only		N
	Through wiring		N
	-- cross-sectional area (mm ²).....:		N
	-- not delivered / mounting insulation		N
	-- factory assembled		N
	-- socket outlet loaded (A).....:		N
	-- temperatures.....:		N
2.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N
	Joints, raising / lowering devices		N
	Telescopic tubes etc.		N

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CL.	Requirement of the test	Result--Remark	Verdict
	No twisting over 360°		P
2.10 (5.3.3)	Openings		N
	Bushings not removable		N
	Bushings in sharp openings		N
	Cables with protective sheath		N
2.10 (5.3.4)	Joints and junctions effectively insulated		N
2.10 (5.3.5)	Strain on internal wiring		N
2.10 (5.3.6)	Wire carriers		N
2.10 (5.3.7)	Wire ends not tinned	No clamping means used for wire connection.	N
	Wire ends tinned: no cold flow		N
2.10	Flexible cables or cords used as a means of connection to the supply, when supplied by the luminaire manufacturer, shall be at least equal in their mechanical and electrical properties to those specified in IEC 60227 ¹⁾ , IEC 60227A ²⁾ or IEC 60245 ³⁾ and shall be capable of withstanding without deterioration the highest temperature to which they may be exposed under normal conditions of use.		N

2.11 (8)	PROTECTION AGAINST ELECTRIC SHOCK		P
2.11 (8.2.1)	Live parts not accessible		P
	Protection in any position		P
	Double-ended tungsten filament lamp		N
	Insulation lacquer not reliable		N
	Double-ended high pressure discharge lamp		N
2.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position	Fixed luminaires.	N
2.11 (8.2.3)	Class II luminaire:		P
	-- basic insulated metal parts not accessible during starter or lamp		N

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CL.	Requirement of the test	Result--Remark	Verdict
	replacement		
	-- basic insulation not accessible other than during starter or lamp replacement		P
	-- glass protective shields not used as supplementary insulation		P
	Class I luminaire with BC lampholder		N
2.11 (8.2.4)	Portable luminaire	Not portable luminaires	N
	-- Protection independent of supporting surface		N
	-- Terminal block completely covered		N
2.11 (8.2.6)	Covers reliably secured		P
2.11 (8.2.7)	Discharging of capacitors $\geq 0.5\mu\text{F}$		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
2.11	The parts of the luminaire and components within the ceiling space or cavity shall provide the same degree of protection against electric shock as the luminaire parts below the ceiling space.		P
2.12 (12)	ENDURANCE TEST AND THERMAL TEST		P
2.12 (12.3.1)	Endurance test:		P
	-- mounting-position.....:	In a similar supporting surface(as in normal operating condition)	P
	-- test temperature ($^{\circ}\text{C}$).....:	40+10 $^{\circ}\text{C}$	P
	-- total duration (h).....:	240h	P
	-- supply voltage: Un factor; calculated voltage (V).....:	264V	P
	-- lamp used.....:	LED lamp	P
2.12 (12.3.2)	After endurance test:		P
	-- no part unserviceable		P

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CL.	Requirement of the test	Result--Remark	Verdict
	-- luminaire not unsafe		P
	-- no damage to track system		N
	-- marking legible		P
	-- no cracks, deformation etc.		P
2.12 (12.4)	Thermal test (normal operation)	See appended table	P
2.12 (12.5)	Thermal test (abnormal operation)	See part 2 and appended table	P
2.12 (12.6)	Thermal test (failed lamp control gear condition):		N
2.12 (12.6.1)	-- case of abnormal conditions.....:		N
	-- electronic lamp control gear		N
	-- measured winding temperature (°C); at 1.1Un.....:		N
	-- measured mounting surface temperature (°C); at 1.1 Un.....:		N
	-- calculated mounting surface temperature (°C).....:		N
	-- track-mounted luminaires		N
2.12 (12.6.2)	Temperature sensing control	No temperature sensing control	N
	-- case of abnormal conditions.....:		N
	-- thermal link		N
	-- manual reset cut-out		N
	-- auto reset cut-out		N
	-- measured mounting surface temperature (°C)		N
	-- track-mounted luminaires		N
2.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires)		N
	-- case of abnormal conditions		N
2.12 (12.7.1)	-- measured winding temperature (°C): at 1.1 Un.....:		N
	-- measured temperature of fixing point / exposed part (°C) at 1.1 Un.....:		N
	-- calculated temperature of fixing point / exposed part (°C).....:		N

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CL.	Requirement of the test	Result--Remark	Verdict
2.12 (12.7.2)	Temperature sensing control		N
	-- thermal link		N
	-- manual reset cut-out		N
	-- auto reset cut-out		N
	-- measured temperature of fixing point / exposed part (°C).....:		N
2.12.1	Wiring, for connection to the supply, which passes into or can touch the luminaire shall not reach unsafe temperature.		P
2.13 (9)	RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE		P
2.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	-- classification according to IP.....:	IP20	P
	-- mounting position during test.....:	See user manual and installation instructions.	P
	-- fixing screws tightened; torque (Nm).....:		N
	-- tests according to clauses.....:		N
	-- 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 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)	No live parts can be touched	P
	No entry into enclosure (IP 3X and IP 4X)		N
2.13 (9.3)	Humidity test 48h	95%RH, 25°C. After this treatment, the EUT show no damage affecting compliance with the requirements of this standard.	P
2.14 (10)	INSULATION RESISTANCE AND ELECTRIC		P

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CL.	Requirement of the test	Result--Remark	Verdict
	STRENGTH		
2.14 (10.2.1)	Insulation resistance test		P
	Insulation resistance (MΩ):		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.....:	>100MΩ (limit: ≥2 MΩ)	P
	-- between live parts and mounting surface.....:	>100MΩ (limit: ≥4 MΩ)	P
	-- between live parts and metal parts.....:	>100MΩ (limit: ≥4 MΩ)	P
	-- between live parts of different polarity through action of a switch.....:		N
2.14 (10.2.2)	Electric strength test		P
	Dummy lamp		N
	Luminaires with ignitors after 24h test		N
	Luminaires with manual ignitors		N
	Test voltage (V)	4U+2750V	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 luminaire....:		N
	Other than SELV:		P
	-- between live parts of different polarity.....:	1480V	P
	-- between live parts and mounting surface.....:	3710V, 1min	P
	-- between live parts and metal parts.....:	3710V, 1min	P
	-- between live parts of different polarity through action of a switch.....:		N

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CL.	Requirement of the test	Result--Remark	Verdict
2.14 (10.3.1)	Leakage current (mA).....:	0.05 (Limit: ≤0.5mA)	P
2.15 (13)	RESISTANCE TO HEAT, FIRE AND TRACKING		P
	-- part tested; temperature (°C).....:	25°C	P
2.15 (13.3.1)	Needle flame test (10s)		N
	-- part tested.....:		N
	-- part tested.....:		N
2.15 (13.2.2)	Glow-wire test (650°C)		P
	-- part tested.....:		P
	-- part tested.....:		P
2.15 (13.4.1)	Tracking test: part tested.....:		P
ZB	ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)		P
(2.2)	Class 0 not accepted		P
(3.3)	DK: power supply cord with label		N
	IT: warning label on class 0 luminaire		N
(4.5.1)	DK: socket-outlets		N
(4.5.1)	FR: socket-outlets		N
(5.2.1)	CY, DK, FI, SE, GB: type of plug		N
ZC	ANNEX ZC, NATIONAL DEVIATIONS (EN)		N
(13.3)	DK: Needle flame test during 30s		N
(13.3)	GB: Requirements according to United Kingdom Building Regulation		N
(13.3.2)	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



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CL.	Requirement of the test	Result--Remark	Verdict

Part 2:	EN 61347-2-13:2006 EN61347-1:2008		
1.	Scope		P
2.	Normative reference		P
3.	Definitions		P
4.	General requirements		P
	Lamp controlgear shall be so designed and constructed that in normal use it operates without danger to the user or surroundings.		P
	Independent SELV controlgear shall comply with the requirements of Annex I. This includes insulation resistance, electric strength, creepage distances and clearances of the outer case.		N
	controlgear which are not of the pure voltage and current types are tested according to the requirements of either a voltage source or a current source, whichever comes closer to the electrical behaviour of the controlgear.		N

5.	General notes on tests		P
5(5.1)	Tests according to this standard are type tests		P
5(5.2)	Unless otherwise specified, the tests are carried out at an ambient temperature of 10°C to 30°C		P
5(5.3)	Unless otherwise specified, the type test is carried out on one sample consisting of one or more items submitted for the purpose of the type test		P
5(5.4)	The tests shall be carried out in the order listed in this standard unless otherwise specified in parts 2 of IEC 61347		P
5(5.5)	For the thermal test, independent lamp controlgear shall be mounted in a test corner		N
5(5.6)	For d.c. supplied ballasts intended for use from a battery supply		N
5(5.7)	Earlier test reports may be updated in accordance with this edition		N

6.	Classification		P
6(6)	according to the method of installation	Integral	P
	According to protection against electric shock	Auto-wound controlgear	P

7.	Marking		N
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CL.	Requirement of the test	Result--Remark	Verdict
7.1	Controlgear, other than integral controlgear, shall be clearly and durably marked		N
7.1(7.1)	a)Mark of origin		N
	b)Model number or type reference of the manufacturer		N
	c)Symbol for independent lamp controlgear 		N
	d)The correlation between replaceable and interchangeable parts		N
	e)Rated supply voltage		N
	f)The earthing terminals (if any) shall be identified by the symbol		N
	k)Wiring diagram indicating the position and purpose of terminals		N
	l)Value of t_c		N
	m) Symbol for temperature declared, thermally protected controlgear 		N
	For constant voltage types: rated output voltage		N
	For constant current type		N
	if applicable: an indication that the control gear is suitable for operation with LED modules only.		N
7.2(7.2)	h) Indication that the lamp controlgear does not rely upon the luminaire enclosure for protection against accidental contact with live parts		N
	i) Indication of the cross-section of conductors for which the terminals		N
	j)The lamp type and rated wattage or wattage range for which the lamp controlgear is suitable		N
	Mention whether the controlgear has mains-connected winding		N
	Mention that they are SELV-equivalent controlgear, if applicable.		N

8.	Protection against accident contact with live parts.		N
8 (10.1)	Live parts not accessible	See part 1	N
	Adequate mechanical strength		N
	Use of tool required		N
	The accessible live part is checked by a test finger.		N

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CL.	Requirement of the test	Result--Remark	Verdict
8 (10.2)	Provision of discharge device (uF, V)		N
8.1	For SELV-equivalent controlgear		N
8.2	Output circuits of SELV- or SELV equivalent control gear		N
9.	Terminals		N
9(8)	Screw terminals to EN 60598-1, Section 14	No such terminal provided.	N
	General		N
	Definitions		N
	General requirements and basic principles		N
	Mechanical tests		N
9(8)	Screwless terminal to EN 60598-1, Section 15		N
	General		N
	Definitions—Screwless terminals		N
	General requirements		N
	General instructions on tests		N
	Terminals and connections for internal wiring		N
	Electrical test		N
	Terminals and connections for external wiring		N
	Mechanical Tests		N
	Electrical tests		N
10.	Provisions for earthing		N
10 (9)	Earthing terminals shall comply with the requirements of clause 8.		N
	The electrical connection/clamping means shall be adequately locked against loosening.		N
	Earthing of lamp controlgear via means of fixing the lamp controlgear to earthed metal is permitted.		N
	Danger of corrosion		N
	Material suitable		N
	Test for the lamp controlgear with conductors for protective earthing provided by tracks on printed circuit boards		N

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CL.	Requirement of the test	Result--Remark	Verdict
11.	Moisture resistance and insulation		N
11 (11)	After humidity test; no appreciable damage		N
	Insulation resistance after humidity test:		N
	-- Live parts of different polarity ($M\Omega$):		N
	-- Live parts and external parts ($M\Omega$):		N
	For SELV-equivalent controlgear, the insulation between input and output terminals not bonded together shall be adequate		N
12.	Electric strength		N
12 (12)	Lamp controlgear shall adequate electric strength.		N
	-- Live parts of different polarity (V):		N
	-- Live parts and external parts (V):		N
	No flashover or breakdown shall occur during the test		N
	Insulation conditions of windings of separating transformers in SELV-equivalent control gear		N
13. (13.)	Thermal endurance of windings		N
	The requirements of clause 14 of IEC 61347-1 do not apply		N
14.	Fault conditions		P
14(14)	There shall be no emission of flames or molten material or production of flammable gases	See appended table	P
	The protection against accidental contact in accordance with 10.1 shall not be impaired		P
14(14.1)	Short circuit across creepage distances and clearances		P
14(14.2)	Short circuit across or, if applicable, interruption of semi-conductor devices		P
14(14.3)	Short circuit across insulation consisting of covering of lacquer, enamel or textile.		N
14(14.4)	Short circuit across electrolytic capacitors.		P
14(14.5)	Compliance is checked by operating the lamp controlgear		P
	The insulation resistance measured at approximately 500 V d.c. shall be not less than 1 $M\Omega$	$\geq 24 M\Omega$	P
	Gases liberated from component parts		P

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CL.	Requirement of the test	Result--Remark	Verdict
	Accessible parts		P
	emission of flames or molten materia		P
15	Transformer heating		N
	In SELV-equivalent controlgear, windings of separating transformers shall be tested according to 7.1 and 11.2 of IEC 60065.		N
(15.1)	For normal operation		N
(15.2)	For operation under abnormal conditions		N
16	Abnormal conditions		P
	The controlgear shall not impair safety when operated under abnormal conditions	See appended table	P
16.1	Controlgear which are of the constant voltage output type		N
	a) No LED module is inserted.		N
	b) Double the LED modules or equivalent load		N
	c) The output terminals of the controlgear shall be short-circuited		N
16.2	Controlgear which are of the constant current output type	No hazard observed.	P
	The maximum output voltage shall not be exceeded		P
	a) No LED module is inserted.		P
	b) Double the LED modules or equivalent load		P
	c) The output terminals of the controlgear shall be short-circuited		P
17.	Construction		P
17(15.1)	Wood, cotton, silk, paper and similar fibrous material		P
17(15.2)	Printed circuits		P
	Socket-outlets in the output circuit		N
18.	Creepage distances and clearances		N
	Unless otherwise specified in Clause 14, the requirements of clause 16 of IEC 61347-1 apply	See part 1	N
18(16)	Creepage distances and clearances shall be not less than the values given in Tables 3 and 4, as appropriate, unless otherwise specified in Clause 14.		N

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CL.	Requirement of the test	Result--Remark	Verdict
	A metal enclosure shall have an insulating lining in accordance with IEC 60598-1		N
	Lamp controlgear, where the components are so encapsulated in a self-hardening compound bonded to the relevant surfaces that no clearances exist, are not checked.		N
	Printed circuit boards are exempt from the requirements of this clause because they are tested according to Clause 14.		N
	Creepage distances shall be not less than the required minimum clearance.		N
19.	Screws, current-carrying parts and connection		N
19(17)	Screws, current-carrying parts and mechanical connections, the failure of which might cause the lamp controlgear to become unsafe, shall withstand the mechanical stresses occurring in normal use.	No screws used in lamp controlgear	N
	Compliance is checked by inspection and the tests of 4.11 and 4.12 of Clause 4 of IEC 60598-1.		N
20.	Resistance to heat, fire and tracking		P
20(18.1)	Parts retaining live parts in position or providing protection against electric shock		P
20(18.2)	resistant to flame and ignition/fire		P
20(18.3)	glow-wire test	Enclosure	P
20(18.4)	needle-flame test		P
20(18.5)	Lamp controlgear intended for building into luminaires other than ordinary		N
21. (19)	Resistance to corrosion		N
	The ferrous parts shall be adequately protected against rusting.	No ferrous parts in this lamp controlgear.	N
	Compliance is checked by the test of 4.18.1 of Clause 4 of IEC 60598-1.		N
	Protection by varnish is deemed to be adequate for the outer surfaces.		N

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CL.	Requirement of the test	Result--Remark	Verdict

APPENDIX			--
Annex A	Test to establish whether a conductive part is a live part which may cause an electric shock.		P
Annex B	Particular requirements for thermally protected lamp controlgear		N
Annex C	Particular requirements for electronic lamp controlgear with means of protection against overheating		N
Annex D	Requirements for carrying out the heating tests of thermally protected lamp controlgear		N
Annex E	Use of contact S other than 4500 in t_w tests		N
Annex F	Draught-proof enclosure		P
Annex G	Explanation of the derivation of the values of pulse voltages		N
Annex H	Test		P
Annex I	Particular additional requirements for independent SELV d.c. or a.c. supplied electronic controlgear for LED modules		P

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CL.	Requirement of the test	Result--Remark	Verdict

ANNEX 1 TABLE: List of critical components					
Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Stan-dard (Edition / year)	Mark(s) of conformity1)
X-capacitor	Various	Various	85°C	--	UL&VDE
ZV	Various	Various	85°C	--	UL
L1 Winding	Various	Various	130°C	--	UL
L1 insulating tape	Various	Various	130°C	--	UL
L1 bobbin	Various	Various	130°C	--	UL
L3 winding	Various	Various	130°C	--	UL
L3 bobbin	Various	Various	130°C	--	UL
L3 insulating tape	Various	Various	130°C	--	UL
C3	Various	Various	130°C	--	UL
C5	Various	Various	130°C	--	UL
F1	Various	Various	130°C	--	UL
D7	Various	Various	130°C	--	UL
D8	Various	Various	130°C	--	UL
D9	Various	Various	130°C	--	UL
U1	Various	Various	85°C	--	UL
Q1	Various	Various	130°C	--	UL
NTC	Various	Various	130°C	--	VDE
insulating base	Various	Various	130°C	--	UL
PCB	Various	Various	130°C	--	UL
internal wire	Various	Various	80°C	--	UL
Enclosure	Various	Various	80°C	--	UL
Supplementary information: N/A					

ANNEX 2 Input test				
voltage (V)/F(Hz)	I measured (A)	Input power (W)	Rated power (W)	Remark
180/50	0.140	21.9	22	Normal Operating
220/50	0.120	22.2	22	Normal Operating
240/50	0.112	22.3	22	Normal Operating
264/50	0.107	22.5	22	Normal Operating

ANNEX 3 TEMPERATURE MEASUREMENTS, THERMAL TESTS OF SECTION 12			P
	Rated voltage (v).....	240	--
	Rated input (w).....	22	--
	Room temperature (°C).....	23.8	--

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CL.	Requirement of the test	Result--Remark	Verdict

Temperature rise dT of part/at:	Measure temperature (°C)	Required temperature (°C)			
Input wire	32.2	80			
FU1	40.3	Refer			
NTC	43.6	Refer			
ZV1	41.9	85			
CX1	40.3	85			
L1 body	46.2	130			
L2 Winding	54.1	130			
L3 Winding	56.1	130			
L4 body	46.6	130			
L2 Core	52.3	130			
L3 Core	55.2	130			
C3	44.9	105			
C5	44.9	105			
C6	49.9	105			
C7	56.1	105			
C8	61.5	105			
PWB near DB1	47.9	130			
PWB under L1	53.3	130			
Yellow insulation board	49.5	130			
White plastic cover	26.2	140			
Plastic near LED	52.4	130			
Enclosure inside	30.1	80			
Enclosure outside	30.7	80			
Ambient	23.8				
Winding temperature rise measurements:					
Temperature rise dT of winding:	R1 (Ω)	R2 (Ω)	dT (K)	Required dT(K)	Insulation class
					--
Remarks: Normal Operating					

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CL.	Requirement of the test	Result--Remark	Verdict

ANNEX 4	Table: Fault condition tests		P
	Rated voltage (v).....:	264V	--
	Rated input (w).....:	22.8	--
	Room temperature (°C).....:	25.2	--

No	Component No`	fault	Test voltage (V)	Test time	Fuse No	Fuse current (A)	Result
1	D8	SC	264	1s	FU1	0	Unit shut down immediately. No hazard observed. Fuse opened.
2	Q1 G-S	SC	264	10min	FU1	--	Unit shut down immediately. No hazard observed.No damage occurred.
3	C4	SC	264	1s	FU1	0	Unit shut down immediately. No hazard observed.Q1 damaged. FU1 opened.
4	C5	SC	264	1s	FU1	0	Unit shut down immediately. No hazard observed.Q1 damaged. FU1 opened.
5	D6	SC	264	1s	FU1	--	Unit shut down immediately No hazard observed.
6	C8	SC	264	1s	FU1	--	Unit shut down immediately No hazard observed.

Note: SC-short circuit

ANNEX 5	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 (mm ²).....:		N
(14.3.3)	Conductor space (mm).....:		N
(14.4)	Mechanical tests		N
(14.4.1)	Minimum distance		N

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CL.	Requirement of the test	Result--Remark	Verdict

(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

ANNEX 6	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
(15.5.1)	Terminals internal wiring		N
(15.5.1.1)	Pull test spring-type terminals (4N, 4 samples)		N
(15.5.1.2)	Pull test pin or tab terminals (4N, 4 samples)		N

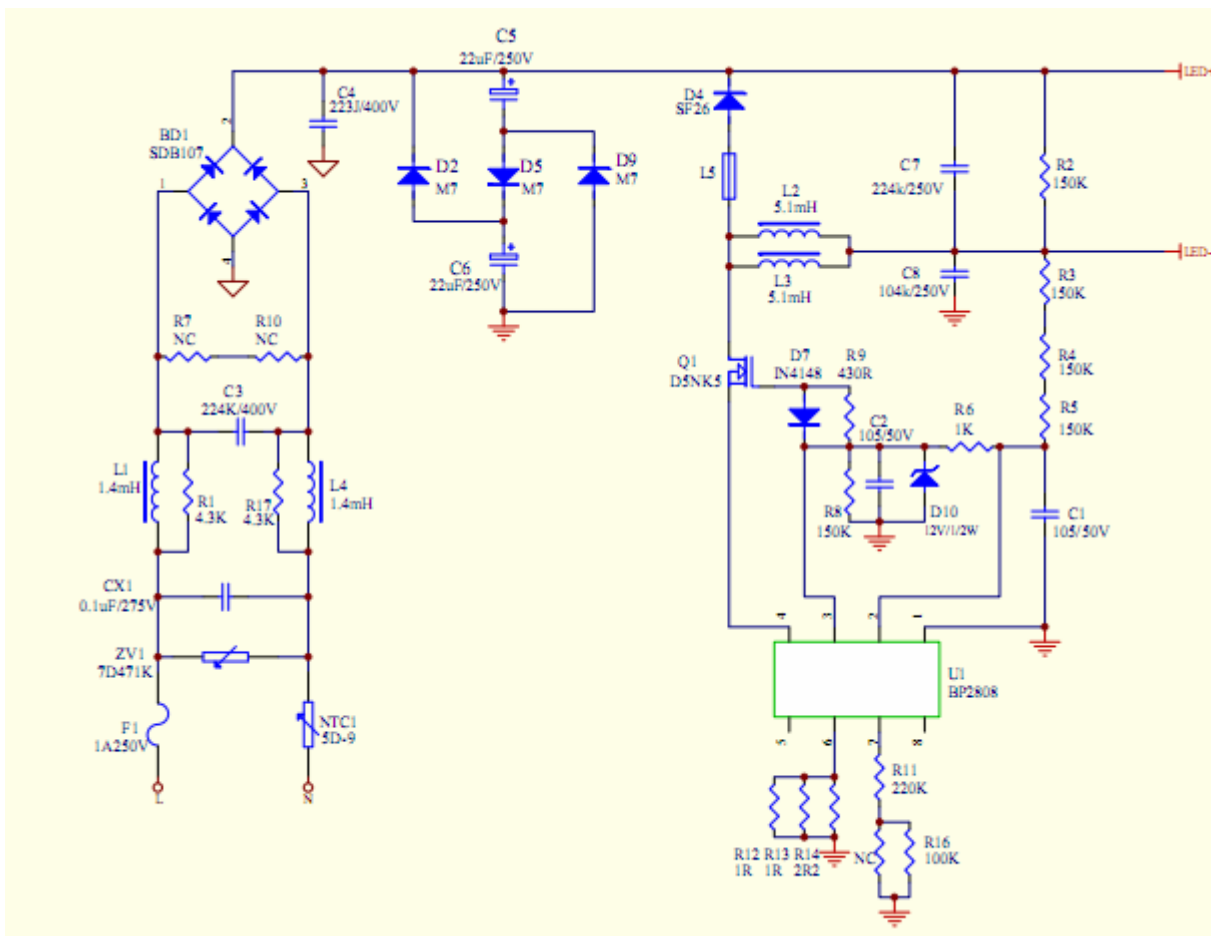
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CL.	Requirement of the test						Result--Remark			Verdict	
	Insertion force not exceeding 50N									N	
(15.5.2)	Permanent connections: pull-off test (20N)									N	
(15.6)	Electrical tests									N	
	Voltage drop (mV) after 1h (4 samples).....									N	
	Voltage drop of two inseparable joints									N	
	Number of cycles.....									N	
	Voltage drop (mV) after 10h alt. 25th cycle (4 samples).....									N	
	Voltage drop (mV) after 50h 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	
(15.7)	Terminals external wiring									N	
	Terminal size and rating									N	
(15.8.1)	Pull test spring-type terminals or welded connectors (4 samples); pull (N).....									N	
	Pull test pin or tab terminals or welded connections (4 samples); pull (N).....									N	
15.9	Contact resistance test									N	
	Voltage drop (mV) after 1h									N	
	Terminal	1	2	3	4	5	6	7	8	9	10
	Voltage drop (mV)										
	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)										
	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)										
	Continued ageing: Voltage drop after 10th alt. 25th cycle									N	

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CL.	Requirement of the test						Result--Remark			Verdict	

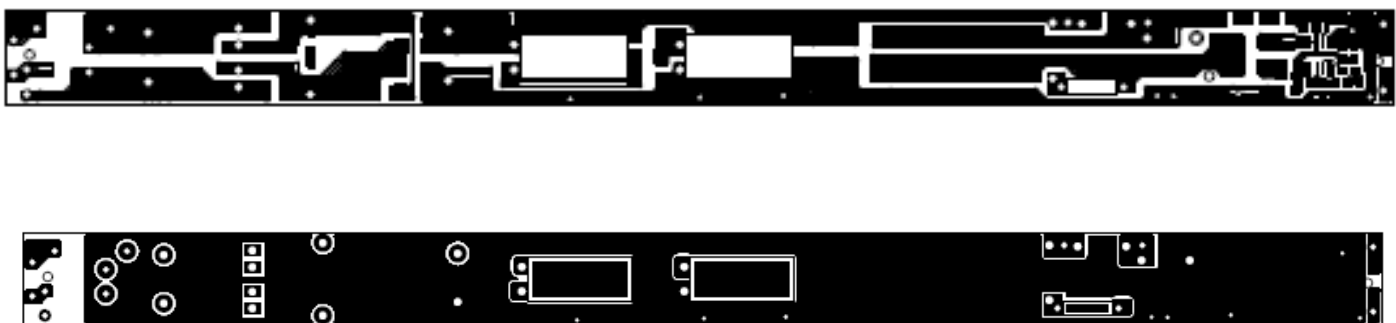
		Max. allowed voltage drop (mV).....:								--	
Terminal		1	2	3	4	5	6	7	8	9	10
Voltage drop (mV)											
		Continued ageing : Voltage drop after 50th alt. 100th cycle								N	
		Max. allowed voltage drop (mV).....:								--	
Terminal		1	2	3	4	5	6	7	8	9	10
Voltage drop (mV)											

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CL.	Requirement of the test	Result--Remark	Verdict

Circuit Diagram:



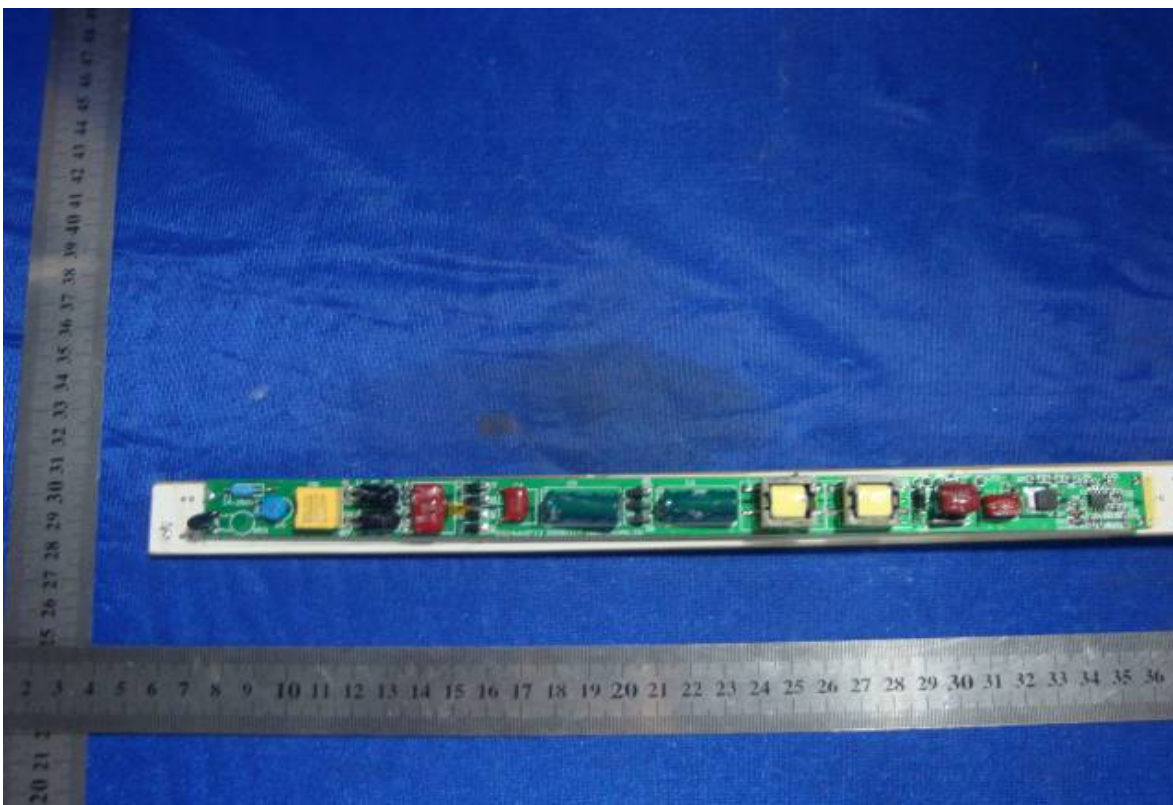
PCB Layout:



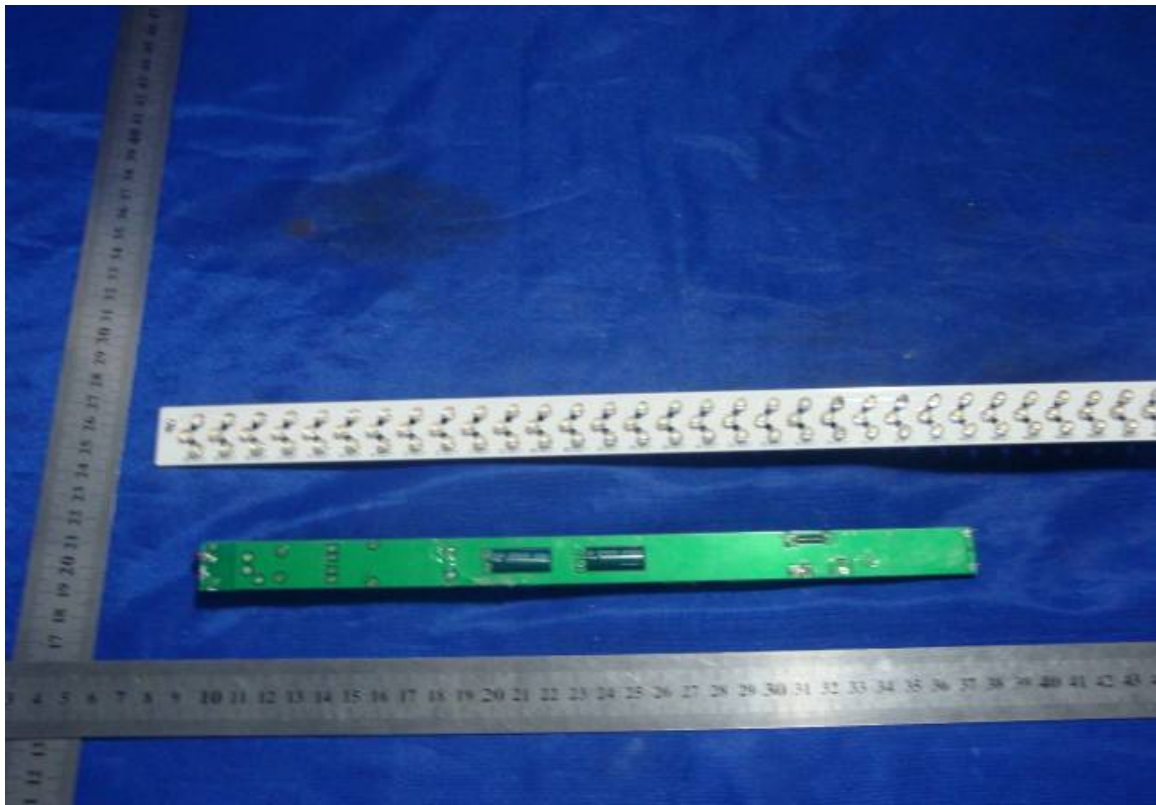
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Appendix:

Photos of the Product



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CL.	Requirement of the test	Result--Remark	Verdict



-End of the report-