

LVD Test Report

Application No. : TB150410352

Applicant : Shenzhen Supernova Technology co.,Ltd

Equipment Under Test (EUT)

EUT Name : LED street light

Model No. : SV-STCSL30W

Series No. : SV-STCSL50W,SV-STSWD50W,SV-STSWD100W
SV-STSWD150W,SV-STCBR50W,SV-STCBR100W
SV-STCBR150W,SV-STHP60W,SV-STHP90W
SV-STHP120W,SV-STHP150W,SV-STHP180W
SV-STCOB50W,SV-STCOB100W,SV-STCOB150W

Brand Name : Supernova

Issue Date : 2015-04-23

Standards : EN 60598-1:2008+A11:2009
EN 60598-2-3:2003+A1:2011

Conclusions : Complied

Report by : *Jason Lou*

Checked by : *Benny Xu*

Approved by : *Dustin Zheng*



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TEST REPORT

EN 60598-2-3

Luminaires

Part 2: Particular requirements:

Section Three – Luminaires for road and street lighting

Report Reference No	TB-LVD142448
Total number of pages.....	34
Testing Laboratory	Shenzhen Toby Technology Co., Ltd.
Address	1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an Shenzhen, Guangdong, China
Applicant's name Shenzhen Supernova Technology co., Ltd
Address	2rd Floor, 116 Xiangshan Avenue, Songgang Street, Baoan District, Shenzhen, china
Test specification:	
Standard	<input type="checkbox"/> IEC 60598-2-3:2002+A1:2011 used in conjunction with <input type="checkbox"/> IEC 60598-1:2008 <input checked="" type="checkbox"/> EN 60598-2-3:2003+A1:2011 used in conjunction with <input checked="" type="checkbox"/> EN 60598-1: 2008 + A11: 2009
Test procedure	LVD Test Report
Non-standard test method.....	N/A
Test Report Form No	IEC/EN 60598_2_3G
Test Report Form(s) Originator	TOBY
Master TRF	2013-05
Test item description	Street Light
Trade Mark	N/A
Manufacturer	UNIVERSELITE CO., LTD.
Model/Type reference.....	See page 1
Ratings	100-277V , 50/60Hz, 180W

Summary of testing:**Tests performed (name of test and test clause):**

- EN 60598-2-3: 2003+A1:2011 used in conjunction with EN 60598-1: 2008+A11:2009
- EN 62031: 2008+A1:2013
- EN 62471: 2008
- EN 62493: 2010

The Photobiological safety of lamps was applied to EN 62471: 2006 declared by client.

The submitted samples were found to comply with the requirements of above test specification.

Summary of compliance with National Differences:

N/A

Copy of marking plate (Take model **LEDLD180W007** for sample)



Note: The marking plate of other models shall be same pattern as above

Test item particulars	
Equipment mobility.....	Fixed
Class of equipment.....	Class I
Degree of protection	IP65
Mass of the equipment.....	N/A
Supply construction.....	Directly connect to AC mains supply
Possible test case verdicts:	
- test case does not apply to the test object	N/A
- test object does meet the requirement	P (Pass)
- test object does not meet the requirement	F (Fail)
Testing	
Date of receipt of test item.....	2014-11-13
Date (s) of performance of tests	2014-11-13 to 2014-11-24
General remarks:	
<p>The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. "(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. Throughout this report a comma is used as the decimal separator. Clause numbers between brackets refer to clause in IEC 60598-1</p>	
General product information:	
Street Light, powered by AC mains supply.	
Declaration of models different:	
<p>The product model SV-STCSL50W,SV-STSWD50W,SV-STSWD100W SV-STSWD150W,SV-STCBR50W,SV-STCBR100W , SV-STCBR150W,SV-STHP60W,SV-STHP90W, SV-STHP120W,SV-STHP150W,SV-STHP180W, SV-STCOB50W,SV-STCOB100W,SV-STCOB150Ware identical in the same PCB layout, interior structure and electrical circuits with the model SV-STCSL30W which was considered/chosen as representative to perform all tests in this report, the differences are only the model No. name, shape size and power input depended on LED quantities.</p>	

EN 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.2 (0)	GENERAL TEST REQUIREMENTS		P
3.2 (0.1)	Information for luminaire design considered	Standard Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
3.2 (0.3)	More sections applicable	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—

3.4 (2)	CLASSIFICATION		P
3.4 (2.2)	Type of protection (Class 0 excluded).....	Fulfill requirements of Class I	—
3.4 (2.3)	Degree of protection (Requirement: Ordinary) :	IP65	—
3.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Luminaire not suitable for direct mounting on normally flammable surfaces	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
3.4 (2.5)	Luminaire for normal use	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Luminaire for rough service	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
3.4 (-)	Modes of installation of road or street lighting		—
	- on a pipe (bracket) or like	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	- on a mast arm	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	- on a post top	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	- on span or suspension wires	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	- on a wall	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—

3.5 (3)	MARKING		P
3.5 (3.2)	Mandatory markings	See marking plate	P
	Position of the marking	See marking plate	P
	Format of symbols/text		P
3.5 (3.3)	Additional information		P
	Language of instructions	English	P
3.5 (3.3.1)	Combination luminaires		N
3.5 (3.3.2)	Nominal frequency in Hz	50/60Hz	P
3.5 (3.3.3)	Operating temperature		N
3.5 (3.3.4)	Symbol or warning notice		N
3.5 (3.3.5)	Wiring diagram		N
3.5 (3.3.6)	Special conditions		N

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EN 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.5 (3.3.7)	Metal halide lamp luminaire – warning		N
3.5 (3.3.8)	Limitation for semi-luminaires		N
3.5 (3.3.9)	Power factor and supply current		N
3.5 (3.3.10)	Suitability for use indoors		N
3.5 (3.3.11)	Luminaires with remote control		N
3.5 (3.3.12)	Clip-mounted luminaire – warning		N
3.5 (3.3.13)	Specifications of protective shields		N
3.5 (3.3.14)	Symbol for nature of supply	~	P
3.5 (3.3.15)	Rated current of socket outlet		N
3.5 (3.3.16)	Rough service luminaire		N
3.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments	Type Z	P
3.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N
3.5 (3.3.19)	Protective conductor current in instruction if applicable		N
3.5 (3.3.20)	Provided with information if not intended to be mounted within arms reach		N
3.5 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P
3.5 (-)	Additional information in instruction leaflet		P
	Design attitude		P
	Weight		P
	Overall dimensions		P
	Maximum projected area if applicable		N
	Cross-sectional area of wires if applicable		N
	Suitability for indoors use		N
	Dimensions of the compartment		N
	Torque setting to be applied to bolts or screws		N

3.6 (4)	CONSTRUCTION		P
3.6 (4.2)	Components replaceable without difficulty		N
3.6 (4.3)	Wireways smooth and free from sharp edges		P
3.6 (4.4)	Lampholders		N

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EN 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.6 (4.4.1)	Integral lampholder		N
3.6 (4.4.2)	Wiring connection		N
3.6 (4.4.3)	Lampholder for end-to-end mounting		N
3.6 (4.4.4)	Positioning		N
	- pressure test (N)		N
	After test the lampholder comply with relevant standard sheets and show no damage		N
	After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation		N
	- bending test (N)		N
	After test the lampholder have not moved from its position and show no permanent deformation		N
3.6 (4.4.5)	Peak pulse voltage		N
3.6 (4.4.6)	Centre contact		N
3.6 (4.4.7)	Parts in rough service luminaires resistant to tracking		N
3.6 (4.4.8)	Lamp connectors		N
3.6 (4.4.9)	Caps and bases correctly used		N
3.6 (4.5)	Starter holders		N
	Starter holder in luminaires other than class II		N
	Starter holder class II construction		N
3.6 (4.6)	Terminal blocks		N
	Tails		N
	Unsecured blocks		N
3.6 (4.7)	Terminals and supply connections		N
3.6 (4.7.1)	Contact to metal parts		N
3.6 (4.7.2)	Test 8 mm live conductor		N
	Test 8 mm earth conductor		N
3.6 (4.7.3)	Terminals for supply conductors		N
3.6 (4.7.3.1)	Welded connections:		N
	- stranded or solid conductor		N
	- spot welding		N
	- welding between wires		N
	- Type Z attachment		N

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EN 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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
3.6 (4.7.4)	Terminals other than supply connection		N
3.6 (4.7.5)	Heat-resistant wiring/sleeves		N
3.6 (4.7.6)	Multi-pole plug		N
	- test at 30 N		N
3.6 (4.8)	Switches:		N
	- adequate rating		N
	- adequate fixing		N
	- polarized supply		N
	- compliance with 61058-1 for electronic switches		N
3.6 (4.9)	Insulating lining and sleeves		N
3.6 (4.9.1)	Retainment		N
	Method of fixing		N
3.6 (4.9.2)	Insulated linings and sleeves		P
	Resistant to a temperature > 20 °C to the wire temperature or		P
	a) & c) Insulation resistance and electric strength		N
	b) Ageing test. Temperature (°C)		N
3.6 (4.10)	Insulation of Class II luminaires		N
3.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation	Class I luminaire	N
	Safe installation fixed luminaires		N
	Capacitors and switches		N
	Interference suppression capacitors according to IEC 60384-14		N
3.6 (4.10.2)	Assembly gaps:		N
	- not coincidental		N
	- no straight access with test probe		N
3.6 (4.10.3)	Retainment of insulation:		N
	- fixed		N
	- unable to be replaced; luminaire inoperative		N

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EN 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- sleeves retained in position		N
	- lining in lampholder		N
3.6 (4.11)	Electrical connections		P
3.6 (4.11.1)	Contact pressure		P
3.6 (4.11.2)	Screws:		P
	- self-tapping screws		N
	- thread-cutting screws		P
3.6 (4.11.3)	Screw locking:		P
	- spring washer		N
	- rivets		N
3.6 (4.11.4)	Material of current-carrying parts		P
3.6 (4.11.5)	No contact to wood or mounting surface		P
3.6 (4.11.6)	Electro-mechanical contact systems		N
3.6 (4.12)	Mechanical connections and glands		P
3.6 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N
	Torque test: torque (Nm); part.....:		N
	Torque test: torque (Nm); part.....:		N
	Torque test: torque (Nm); part.....:		N
3.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N
3.6 (4.12.4)	Locked connections:		P
	- fixed arms; torque (Nm)		N
	- lampholder; torque (Nm)		N
	- push-button switches; torque 0,8 Nm.....:		N
3.6 (4.12.5)	Screwed glands; force (Nm).....:		N
3.6 (4.13)	Mechanical strength		P
3.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm).....:	.0.5N.m for Lamp transparent cover	P
	- other parts; energy (Nm).....:		N
	1) live parts		P
	2) linings		P
	3) protection		P

EN 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	4) covers		P
3.6 (4.13.3)	Straight test finger		P
3.6 (4.13.4)	Rough service luminaires		N
	- IP54 or higher		N
	a) fixed		N
	b) hand-held		N
	c) delivered with a stand		N
	d) for temporary installations and suitable for mounting on a stand		N
3.6 (4.13.6)	Tumbling barrel		N
3.6 (4.14)	Suspensions and adjusting devices		N
3.6 (4.14.1)	Mechanical load:		N
	A) four times the weight		N
	B) torque 2,5 Nm		N
	C) bracket arm; bending moment (Nm)		N
	D) load track-mounted luminaires		N
	E) clip-mounted luminaires, glass-shelve. Thickness (mm)		N
	Metal rod. diameter (mm)		N
	Fixed luminaire or independent control gear without fixing devices		N
3.6 (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
3.6 (4.14.3)	Adjusting devices:		N
	- flexing test; number of cycles		N
	- strands broken		N
	- electric strength test afterwards		N
3.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N
3.6 (4.14.5)	Guide pulleys		N
3.6 (4.14.6)	Strain on socket-outlets		N
3.6 (4.15)	Flammable materials:		N

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EN 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- glow-wire test 650 °C		N
	- spacing \geq 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
3.6 (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
3.6 (4.16)	Luminaires for mounting on normally flammable surfaces		P
	No lamp control gear		N
3.6 (4.16.1)	Lamp control gear spacing:		N
	- spacing 35 mm		N
	- spacing 10 mm		N
3.6 (4.16.2)	Thermal protection:		N
	- in lamp control gear		N
	- external		N
	- fixed position		N
	- temperature marked lamp control gear		N
3.6 (4.16.3)	Design to satisfy the test of 12.6	(see 12.6)	P
3.6 (4.17)	Drain holes		N
	Clearance at least 5 mm		N
3.6 (4.18)	Resistance to corrosion:		N
3.6 (4.18.1)	- rust-resistance		N
3.6 (4.18.2)	- season cracking in copper		N
3.6 (4.18.3)	- corrosion of aluminium		N
3.6 (4.19)	Ignitors compatible with ballast		N
3.6 (4.20)	Rough service vibration		N
3.6 (4.21)	Protective shield:		N
3.6 (4.21.1)	Shield fitted		N
	Shield of glass if tungsten halogen lamps		N

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Clause	Requirement + Test	Result - Remark	Verdict
3.6 (4.21.2)	Particles from a shattering lamp not impair safety		N
3.6 (4.21.3)	No direct path		N
3.6 (4.21.4)	Impact test on shield		N
	Glow-wire test on lamp compartment		N
3.6 (4.22)	Attachments to lamps		N
3.6 (4.23)	Semi-luminaires comply Class II		N
3.6 (4.24)	UV radiation for tungsten halogen lamps and metal halide lamps (Annex P)		N
3.6 (4.25)	No sharp point or edges		P
3.6 (4.26)	Short-circuit protection:		N
3.6 (4.26.1)	Uninsulated accessible SELV parts		N
3.6 (4.26.2)	Short-circuit test		N
3.6 (4.26.3)	Test chain according to Figure 29		N
3.6.1 (-)	At least IP X3 or X5 respectively	IP66	P
	Column-integrated luminaires:		N
	- parts below 2,5 m		N
	- parts above 2,5 m		N
3.6.2 (-)	Suspension on span wires		N
3.6.3 (-)	Means for attaching the luminaire or external parts to its support appropriate to the weight		N
3.6.3.1 (-)	Static load test		N
	- drag coefficient.....:		N
	- loaded area (m ²).....:		N
	- used load (N).....:		N
	- measured deformation (cm/m)		N
	- no rotation		N
3.6.4 (-)	Adjustable lampholders		N
3.6.5 (-)	Glass cover:		N
	- means of protection.....:		N
	- number of particles.....:		N
3.6.6 (-)	Connection compartment of column-integrated luminaire		N
	- provides adequate space		N
	- means for attachment		N
3.6.7 (-)	Compliance with		N

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EN 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.6.8 (-)	Doors of column-integrated luminaires:		N
	- corrosion resistance		N
	- opening only possible for an authorized person		N
	- impact test		N
3.6.9 (-)	Column-integrated luminaire:		N
	- dimension of the entry slot (mm)..... :		N
	- cable path from the slot to the connection compartment (mm)		N
	- cable path free from obstruction that might cause abrasion of the cable		N

3.7 (11)	CREEPAGE DISTANCES AND CLEARANCES		P
	Working voltage (V)..... :	100-277V~	—
	Voltage form	Sinusoidal <input checked="" type="checkbox"/> Non-sinusoidal <input type="checkbox"/>	—
	PTI	< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>	—
	Impulse withstand category (Normal category II) (Category III Annex U)	Category II <input checked="" type="checkbox"/> Category III <input type="checkbox"/>	—
	Rated pulse voltage (kV)..... :	--	—
	(1) Current-carrying parts of different polarity: cr (mm); cl (mm)..... :	+/- on LED module (PTI<600): Cr=1.5 mm; Cl=1.5 mm;	P
	(2) Current-carrying parts and accessible parts: cr (mm); cl (mm)..... :	For LED module to metal enclosure Cr=>3 mm; Cl=>3 mm;	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		—
	(6) Current-carrying parts and supporting surface: cr (mm); cl (mm)..... :		N

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Clause	Requirement + Test	Result - Remark	Verdict
3.8 (7)	PROVISION FOR EARTHING		P
3.8 (7.2.1 + 7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		P
	Resistance < 0,5 Ω	0.1Ω	P
	Self-tapping screws used		N
	Thread-forming screws		N
	Thread-forming screw used in a groove		N
	Earth makes contact first		N
3.8 (7.2.2 + 7.2.3)	Earth continuity in joints etc.		N
3.8 (7.2.4)	Locking of clamping means		P
	Compliance with 4.7.3		P
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		P
3.8 (7.2.5)	Earth terminal integral part of connector socket		P
3.8 (7.2.6)	Earth terminal adjacent to mains terminals		P
3.8 (7.2.7)	Electrolytic corrosion of the earth terminal		P
3.8 (7.2.8)	Material of earth terminal		P
	Contact surface bare metal		P
3.8 (7.2.10)	Class II luminaire for looping-in		N
	Double or reinforced insulation to functional earth		N
3.8 (7.2.11)	Earthing core coloured green-yellow	1.0 mm ²	P
	Length of earth conductor		P
3.8.1 (-)	Attachment prevented from rotation		N
3.9 (14)	SCREW TERMINALS		N
	Separately approved; component list		N
	Part of the luminaire		N
3.9 (15)	SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS		N
	Separately approved; component list		N
	Part of the luminaire		N

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Clause	Requirement + Test	Result - Remark	Verdict
3.10 (5)	EXTERNAL AND INTERNAL WIRING		P
3.10 (5.2)	Supply connection and external wiring		P
3.10 (5.2.1)	Means of connection	Directly connected to AC mains supply	P
3.10 (5.2.2)	Type of cable.....		P
	Nominal cross-sectional area (mm ²).....	3G,1.0mm ²	P
	Cables equal to IEC 60227 or IEC 60245		P
3.10 (5.2.3)	Type of attachment, X, Y or Z	Type Z	P
3.10 (5.2.5)	Type Z not connected to screws		N
3.10 (5.2.6)	Cable entries:		N
	- suitable for introduction		N
	- adequate degree of protection		N
3.10 (5.2.7)	Cable entries through rigid material have rounded edges		N
3.10 (5.2.8)	Insulating bushings:		N
	- suitably fixed		N
	- material in bushings		N
	- material not likely to deteriorate		N
	- tubes or guards made of insulating material		N
3.10 (5.2.9)	Locking of screwed bushings		N
3.10 (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
3.10 (5.2.10.1)	Cord anchorage for type X attachment:		N
	a) at least one part fixed		N
	b) types of cable		N
	c) no damaging of the cable		N
	d) whole cable can be mounted		N
	e) no touching of clamping screws		N
	f) metal screw not directly on cable		N
	g) replacement without special tool		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Glands not used as anchorage		N
	Labyrinth type anchorages		N
3.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		P
3.10 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N).....: 60N		P
	- torque test: torque (Nm): 0.25Nm		P
	- displacement \leq 2 mm	0.5mm	P
	- no movement of conductors		P
	- no damage of cable or cord		P
3.10 (5.2.11)	External wiring passing into luminaire		P
3.10 (5.2.12)	Looping-in terminals		N
3.10 (5.2.13)	Wire ends not tinned		N
	Wire ends tinned: no cold flow		N
3.10 (5.2.14)	Mains plug same protection		N
	Class III luminaire plug		N
3.10 (5.2.16)	Appliance inlets (IEC 60320)		N
	Appliance couplers of class II type		N
3.10 (5.2.17)	No standardized interconnecting cables properly assembled		N
3.10 (5.2.18)	Used plug in accordance with		N
	- IEC 60083		N
	- other standard		N
3.10 (5.3)	Internal wiring		P
3.10 (5.3.1)	Internal wiring of suitable size and type	Approved by UL	P
	Through wiring		N
	- not delivered/ mounting instruction		N
	- factory assembled		N
	- socket outlet loaded (A):		N
	- temperatures: (see Annex 2)		P
	Green-yellow for earth only		N
3.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P

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EN 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Cross-sectional area (mm ²).....:	See appended table	P
	Insulation thickness	See appended table	P
	Extra insulation added where necessary		N
3.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		N
	Adequate cross-sectional area and insulation thickness		N
3.10 (5.3.1.3)	Double or reinforced insulation for class II	Class I luminaire	N
3.10 (5.3.1.4)	Conductors without insulation		N
3.10 (5.3.1.5)	SELV current-carrying parts		N
3.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N
3.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N
	Joints, raising/lowering devices		N
	Telescopic tubes etc.		N
	No twisting over 360°		N
3.10 (5.3.3)	Insulating bushings:		N
	- suitable fixed		N
	- material in bushings		N
	- material not likely to deteriorate		N
	- cables with protective sheath		N
3.10 (5.3.4)	Joints and junctions effectively insulated		P
3.10 (5.3.5)	Strain on internal wiring		P
3.10 (5.3.6)	Wire carriers		N
3.10 (5.3.7)	Wire ends not tinned		N
	Wire ends tinned: no cold flow		N
3.10.1 (-)	Cord anchorage if applicable		P
	- pull test: 25 times; pull (N).....:	60N	P
	- torque test: torque (Nm).....:	0.25Nm	P

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Clause	Requirement + Test	Result - Remark	Verdict
3.11 (8)	PROTECTION AGAINST ELECTRIC SHOCK		P
3.11 (8.2.1)	Live parts not accessible with standard test finger		P
	Basic insulated parts not used on the outer surface without appropriate protection		P
	Basic insulated parts not accessible with standard test finger on portable and adjustable luminaires		N
	Basic insulated parts not accessible with Ø 50 mm probe from outside, 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
3.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N
3.11 (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		N
3.11 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N
3.11 (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

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EN 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.11 (8.2.4)	Portable luminaire:		N
	- protection independent of supporting surface		N
	- terminal block completely covered		N
3.11 (8.2.5)	Compliance with the standard test finger or relevant probe		P
3.11 (8.2.6)	Covers reliably secured		P
3.11 (8.2.7)	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

3.12 (12)	ENDURANCE TEST AND THERMAL TEST		P
3.12 (12.3)	Endurance test:		P
	- mounting-position..... :	As in normal use (this test was performed directly supplied by AC power source)	—
	- test temperature (°C)..... :	50+10 °C=60 °C	—
	- total duration (h)..... :	240h	—
	- supply voltage: Un factor; calculated voltage (V)..... :	1.1*277=307V	—
	- lamp used..... :	LED Module	—
3.12 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N
	- marking legible		P
	- no cracks, deformation etc.		P
3.12 (12.4)	Thermal test (normal operation)		P
3.12 (12.5)	Thermal test (abnormal operation)		P
3.12 (12.6)	Thermal test (failed lamp control gear condition):		N
3.12 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A)..... :		—
	- case of abnormal conditions..... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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
3.12 (12.6.2)	Temperature sensing control		N
	- case of abnormal conditions..... :		—
	- thermal link		N
	- manual reset cut-out		N
	- auto reset cut-out		N
	- measured mounting surface temperature (°C):		N
	- track-mounted luminaires		N
3.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N
3.12 (12.7.1)	Luminaire without temperature sensing control		N
3.12 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N
	Test method 12.7.1.1 or Annex V..... :		—
	Test according to 12.7.1.1:		N
	- case of abnormal conditions		—
	- Ballast failure at supply voltage (V) :		—
	- Components retained in place after the test		N
	- Test with standard test finger after the test		
	Test according to Annex V:		N
	- case of abnormal conditions		—
	- measured winding temperature (°C): at 1,1 Un :		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un :		—
	- calculated temperature of fixing point/exposed part (°C)..... :		—
	Ball-pressure test:		N
	- part tested; temperature (°C) :		N
	- part tested; temperature (°C) :		N

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EN 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N
	- case of abnormal conditions		—
	- measured winding temperature (°C): at 1,1 Un:		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un		—
	- calculated temperature of fixing point/exposed part (°C).....:		—
	Ball-pressure test:		N
	- part tested; temperature (°C)		N
	- part tested; temperature (°C)		N
3.12 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N
	- case of abnormal conditions		—
	- Components retained in place after the test		N
	- Test with standard test finger after the test		N
3.12 (12.7.2)	Luminaire with temperature sensing control		N
	- thermal link	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- manual reset cut-out	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- auto reset cut-out	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- 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
3.12.1 (-)	Temperature reduction if for outdoor use only		N
3.12.2 (-)	Tests order for luminaires with > IP 20		N

3.13 (9)	RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE		P
3.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		N
	- classification according to IP	IP65	—
	- mounting position during test	As in normal use	—
	- fixing screws tightened; torque (Nm).....	--	—

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EN 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- tests according to clauses.....:	Clause 9.2	—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N
	b) no talcum in dust-tight luminaire		N
	c) no trace of water on current-carrying parts or SELV parts or where it could become a hazard		P
	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		P
3.13 (9.3)	Humidity test 48 h		P
3.13.1 (-)	Tests order for luminaires with > IP 20		—

3.14 (10)	INSULATION RESISTANCE AND ELECTRIC STRENGTH		—
3.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø		—
	Insulation resistance (MΩ)		—
	SELV:		P
	- between current-carrying parts of different polarity.....:		P
	- between current-carrying parts and mounting surface		N
	- between current-carrying parts and metal parts of the luminaire.....:		P
	Other than SELV:		P
	- between live parts of different polarity.....:	>500MΩ	P
	- between live parts and mounting surface.....:		N
	- between live parts and metal parts.....:	>500MΩ	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- between live parts of different polarity through action of a switch.....:		N
3.14 (10.2.2)	Electric strength test		P
	Dummy lamp		N
	Luminaires with ignitors after 24 h test		N
	Luminaires with manual ignitors		N
	Test voltage (V):		N
	SELV:		P
	- between current-carrying parts of different polarity.....:		P
	- between current-carrying parts and mounting surface		N
	- between current-carrying parts and metal parts of the luminaire.....:		P
	Other than SELV:		P
	- between live parts of different polarity.....:	2*277+1000=1554V	P
	- between live parts and mounting surface.....:		N
	- between live parts and metal parts.....:	2*277+1000=1554V	P
	- between live parts of different polarity through action of a switch.....:		N
3.14 (10.3)	Touch current (mA)	0.08mA	P

3.15 (13)	RESISTANCE TO HEAT, FIRE AND TRACKING		-
3.15 (13.2.1)	Ball-pressure test:		P
	- part tested; temperature (°C)	PCB of LED module: 125°C Impression: 0.2mm	P
	- part tested; temperature (°C).....:		N
	- part tested; temperature (°C).....:		N
3.15 (13.3.1)	Needle flame test (10 s):		P
	- part tested	PCB of LED module	P
	- part tested		N
3.15 (13.3.2)	Glow-wire test (650°C):		P
	- part tested	PCB of LED module	P
	- part tested		N

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EN 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.15 (13.4.1)	Tracking test: part tested	Complied with IP65	N

ANNEX 1: components					
Object/ part No.	Manufacturer/ trademark	Type/model	Technical data	Standard	Mark(s) of conformity
LED driver	MEAN WELL	HLG-185H-36A	Input:AC100-277V, 50/60Hz Output: DC36V, 5.2A	EN 61347-2- 13	CE
Supply cord	Various	IEC53 (RVV)	3×1.0mm ² , PVC, 300/500V, 90°C	DIN VDE 0281-5	VDE
Internal wire	Various	Various	VW-1, 18AWG min, 105°C, 300V	--	UL
LED PCB	Various	Various	V-0, 130°C	--	UL

ANNEX 2:	temperature measurements, thermal tests of Section 12					P
Type reference :	SV-STCSL30W				---	
Lamp used :	LED				---	
Lamp control gear used :	Electronic driver				---	
Mounting position of luminaire :	As in normal use				---	
Supply wattage (W) :	--				---	
Supply current (A) :	--				---	
Calculated power factor :	--				---	
Table: measured temperatures corrected for $t_a = 50\text{ }^\circ\text{C}$:					P	
- abnormal operating mode :	--				---	
- test 1: rated voltage	100V				---	
- test 2: 1,06 times rated voltage or 1,05 times rated wattage	277*1.06=293.6V Corrected to specified ambient 60°C				---	
- 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 ($^\circ\text{C}$) of part	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1 90V	test 2 254.4V	test 3	limit	test 4	limit
LED driver output wire lead	30.5	29.1	--	90-50	--	--
Power cord	32.6	31.8	--	90-50	--	--
Enclosure of LED driver	36.4	34.8	--	90-50	--	--
Metal enclosure	37.2	36.9	--	Ref.	--	--
Transparent cover of LED module	59.2	58.7	--	Ref.	--	--
Ambient	50	50	--	50	--	--

EN 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
ANNEX 3:	screw terminals (part of the luminaire)		—
(14)	SCREW TERMINALS		P
(14.2)	Type of terminal	Pillar terminals	—
	Rated current (A)	16A	—
(14.3.2.1)	One or more conductors	One	P
(14.3.2.2)	Special preparation		N
(14.3.2.3)	Terminal size	2	P
	Cross-sectional area (mm ²)	1.0mm ²	P
(14.3.3)	Conductor space (mm)	3.0mm	P
(14.4)	Mechanical tests		N
(14.4.1)	Minimum distance	1.62mm	P
(14.4.2)	Cannot slip out		P
(14.4.3)	Special preparation		N
(14.4.4)	Nominal diameter of thread (metric ISO thread)		P
	External wiring		P
	No soft metal		P
(14.4.5)	Corrosion		P
(14.4.6)	Nominal diameter of thread (mm)	3.46mm	P
	Torque (Nm)	0.4 Nm	P
(14.4.7)	Between metal surfaces		P
	Lug terminal		N
	Mantle terminal		N
	Pull test; pull (N)	50N	P
(14.4.8)	Without undue damage		P

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

ANNEX 4:	screwless terminals (part of the luminaire)		—
(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 (4 N, 4 samples).....:		N
(15.5.1.2)	Pull test pin or tab terminals (4 N, 4 samples).....:		N
	Insertion force not exceeding 50 N		N
(15.5.2)	Permanent connections: pull-off test (20 N)		N
(15.6)	Electrical tests		N
	Voltage drop (mV) after 1 h (4 samples).....:		N
	Voltage drop of two inseparable joints		N
	Number of cycles		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples).....:		N
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples).....:		N
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples).....:		N
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples).....:		N
(15.7)	Terminals external wiring		N
	Terminal size and rating		N

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Clause	Requirement + Test									Verdict
(15.8.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N)									N
	Pull test pin or tab terminals (4 samples); pull (N)									N
(15.9)	Contact resistance test									N
	Voltage drop (mV) after 1 h									N
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)										

ZB	ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)									—
(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

ZC	ANNEX ZC, NATIONAL DEVIATIONS (EN)									—
(4 & 5)	FR: Shuttered socket-outlets 10/16A									N

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EN 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
(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

ANNEX 5-EMF IEC 62493 : 2009			
	The Tested product also complies to the requirements of IEC 62493 : 2009		--
	Limit0.85 (F)	Measured max. :0.1519	P

EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict
Annex 6			
4	GENERAL REQUIREMENTS		—
4.4	Integral modules treated as part of luminaires defined in clause 0.5 of IEC 60598-1	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
4.5	Independent modules complies with requirements in IEC 60598-1	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
5	GENERAL TEST REQUIREMENTS		—
5.5	SELV-operated LED modules comply with Annex I of IEC 61347-2-13	(see Annex B)	—
6	CLASSIFICATION		
	Built-in module	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Independent module	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Integral module	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	For Integral module; Note to 1.2.1 in IEC 60598-1 applies.		—
7	MARKING		N
	Requirements not applicable to the evaluated product.		—
8	SCREW TERMINALS		—
	Compliance with section 14 of IEC 60598-1		N
	SCREWLESS TERMINALS		—
	Compliance with section 15 of IEC 60598-1		N
	CONNECTORS		—
	Compliance with IEC 60838-2-2		N
9	PROVISION FOR PROTECTIVE EARTHING		N
	Requirements not applicable to the evaluated product.		—
8 (10)	PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS		N
	Requirements not applicable to the evaluated product.		—

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Clause	Requirement + Test	Result - Remark	Verdict

Annex 6

11	MOISTURE RESISTANCE AND INSULATION		—
	Protection against moisture and insulation in compliance with Clause 11, IEC 61347-1		P
12	ELECTRIC STRENGTH		—
	Electric strength in compliance with Clause 12 of IEC 61347-1		P

13	FAULT CONDITIONS		—
13.1	In compliance with IEC 61347-1 (clause numbers between parentheses refer to IEC 61347-1)		P
13.2	Module withstands overpower condition >15 min.		P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		N
	During the tests, tissue paper, spread below module, does not ignite.		P

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

16	CREEPAGE DISTANCES AND CLEARANCES		—
	Creepage and distances and clearances in compliance with IEC 60598-1		P

17 (17)	SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS		—
	Screws, current-carrying parts and connections in compliance with IEC 60598-1		P

18 (18)	RESISTANCE TO HEAT, FIRE AND TRACKING		—
	Resistance to Heat, Fire and Tracking in compliance with IEC 61347-1 (clause numbers between parentheses refer to IEC 61347-1)		P

19	RESISTANCE TO CORROSION		—
	Resistance to corrosion in compliance with IEC 61347-1		P

A	ANNEX A - TESTS		—
	All tests performed in accordance with the advise given in Annex H of IEC 61347-1, if applicable		P

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Clause	Requirement + Test	Result - Remark	Verdict

Annex 6

B	ANNEX B - SELV-operated LED modules		—
	SLVE-operated LED modules in compliance with Annex I of IEC 61347-2-13		P

EUT Photos

Photo 1 View of EUT



Photo 2 Rear of EUT



End of Report

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