LVD Test Report

Application No.	:	TB150410349
Applicant	:	Shenzhen Supernova Technology co.,Ltd .
Equipment Under Test (EUT)		
EUT Name	:	LED High bay light
Model No.	:	SV-HBCOB80W
Series No.	:	SV-HBCOB100W,SV-HBCOB120W,SV-HBCOB150W SV-HBCR100W,SV-HBCR120W, SV-HBCR150W, SV-HBCR180W,SV-HBCR240W,SV-HBCR300W
Brand Name	:	Supernova
Issue Date	:	2015-04-23
Standards	:	EN 60598-2-1:1989 EN 60598-1:2008+ A11: 2009
Conclusions	:	Complied

This report shows that the product technically complies with the Council LVD Directive **2006/95/EC** requirements.

Report by : Jason Lu

Checked by : Benny Xu

Approved by : Austin Zhang

SHENZHEN TOBY TECHNOLOGY CO.,LTD. TOBY

TEST REPORT

EN 60598-1 & EN 60598-2-1
Luminaires
Part 1: General Requirements And Tests
Part 2: Particular requirements –
Section 1: Fixed general purpose luminaires

Report Reference No......:	TB-LVD142450
Total number of pages.....:	32 pages
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.....:	☒ EN 60598-2-1:1989 used in with conjunction EN 60598-1:2008+ A11: 2009 ☐ IEC 60598-2-1:1979 + A1: 1987 used in with conjunction IEC 60598-1:2008
Test procedure .....:	LVD Test Procedure
Non-standard test method..... :	N/A
Test Report Form No......:	IEC/EN 60598_2_1C
Test Report Form(s) Originator .....:	TOBY
Master TRF .....:	Dated 2013-06
Test item description ..... :	High Bay Light
Trade Mark .....:	N/A
Manufacturer .....:	Shenzhen Supernova Technology co.,Ltd
Model/Type reference.....:	SV-HBCOB80W, SV-HBCOB100W,SV-HBCOB120W SV-HBCOB150W,SV-HBCR100W,SV-HBCR120W SV-HBCR150W,SV-HBCR180W,SV-HBCR240W SV-HBCR300W
Ratings .....:	100-277VAC, 50/60Hz, 200W

Summary of testing:

Tests performed (name of test and test clause):

- EN 60598-2-1: 1989
- 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:

Compliance with the National requirements of CENELEC common modification.

Copy of marking plate (Take model LEDGC200W007 for example)

Tunnel Light
Model: SV-HBCOB80W
Rating: 100-277VAC, 50/60Hz, 200W

UNIVERSELITE CO., LTD.
Made In China

Remark: The marking plate of the other models shall be of same pattern.

Test item particulars ..... :	
Equipment mobility ..... :	Fixed
Supply Connection ..... :	Directly connected to supply mains
Protection class ..... :	Class I
Degree of protection ..... :	IP 65
Possible test case verdicts:	
- test case does not apply to the test object .....:	N (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 .....:	2014-11-04
Date(s) of performance of tests .....:	2014-11-04 to 2014-11-24

Test report also include European group differences and national differences for En 60598-2-1: 1989 and EN 60598-1: 2008+A11: 2009

General remarks:

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

General product information:

Fixed luminaire, supplied by mains supply.

The High Bay Light complies with class I requirements of this standard

Declaration of models different:
The product all models are identical in the same construction, interior structure and electrical circuits with the model LEDGC200W007 having max power input was considered/chosen as representative to perform all tests in this report, the differences are only the model name, shape size.

EN 60598-2-1			
Clause	Requirement + Test	Result – Remark	Verdict
0	**GENERAL TEST REQUIREMENT**		—
0.1	Information for luminaire design considered	Yes ☒ No ☐	—
0.3	More sections applicable	Yes ☐ No ☒	—
2	CLASSFICATION		—
2.2	Type of protection (Class 0 excluded)	Class I	—
2.3	Degree of protection (Requirement: Ordinary)	IP65	—
2.4	Luminaire suitable for direct mounting on normally Flammable surfaces	Yes ☒ No ☐	—
	Luminaire not suitable for direct mounting on normally flammable surfaces	Yes ☐ No ☒	—
2.5	Luminaire for normal use	Yes ☒ No ☐	—
	Luminaire for rough servece	Yes ☐ No ☒	—
3	MARKING		—
3.2	Mandatory markings	See marking plate	P
	Position of the marking	Stick on product's external enclosure	P
	Format of symbols/text		P
3.3	Additional information		P
	Language of instructions	English	P
3.3.1	Combination luminaires		N
3.3.2	Normal frequency in Hz	50/60Hz	P
3.3.3	Operating temperature		N
3.3.4	Symbol or warming notice		N
3.3.5	Wiring diagram		N
3.3.6	Special conditions		N
3.3.7	Metal halide lamp luminaire – warning		N
3.3.8	Limitation for semi-luminaires		N
3.3.9	Power factor and supply current		N
3.3.10	Suitability for use indoors		N
3.3.11	Luminaires with remote control		N
3.3.12	Clip-mounted luminaire - warning		N
3.3.13	Specification of protective shields		N
3.3.14	Symbol for nature of supply	~	P
3.3.15	Rated current of socket outlet		N

EN 60598-2-1			
Clause	Requirement + Test	Result – Remark	Verdict
3.3.16	Rough service luminaire		N
3.3.17	Mounting instruction for type Y, type Z and some type X attachment.	Type Y	P
3.3.18	Non-ordinary luminaires with PVC cable		N
3.3.19	Protective conductor current in instruction if applicable		N
3.3.20	Provided with information if not intended to be mounted within arms reach		N
3.4	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P
3.3.101	Adequate warning on the package		N
4	CONSTRUCTION		—
4.2	Components replaceable without difficulty		P
4.3	Wireways smooth and free from sharp edges		P
4.4	Lampholder	No lampholder provided	N
4.4.1	Integral lampholder		N
4.4.2	Wiring connection		N
4.4.3	Lampholder for end-to-end mounting		N
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 mouved from its position and show no permanent deformation.		N
	-Bendng test (N)		N
	After test with the lampholder have not moved from its position and show no permanent deformation.		N
4.4.5	Peak pulse voltage		N
4.4.6	Centre contact		N
4.4.7	Parts in rough service luminaires resistant to tracking		N
4.4.8	Lamp connectors		P
4.4.9	Caps and bases correctly used		N

EN 60598-2-1			
Clause	Requirement + Test	Result – Remark	Verdict
4.5	Starter holder	No starter holder provided	N
	Starter holder in luminaires other class II		N
	Starter holder class II construction		N
4.6	Terminal blocks		N
	Tails		N
	Unsercured blockes		N
4.7	Terminal and supply connections		P
4.7.1	Contact to metal parts		N
4.7.2	Test 8 mm live conductor	No contact to living parts	P
	Test 8 mm earth conductor		N
4.7.3	Terminals for supply conductors		P
4.7.3.1	Welded connection:		N
	- stranded or solid conductor		N
	- spot welding		N
	- welding between wires		N
	- Type Z attachment		N
	- mechanical test according to 15.8.2		N
	- electrical tst according to 15.9		N
	- heat test according to 15.9.2.3 and 15.9.2.4		N
	- heat test according to 15.9.2.3 and 15.9.2.4		N
4.7.4	Terminal other than supply connection		P
4.7.5	Heat-resistant wiring/sleeves		N
4.7.6	Multi-pole plug	No pulg provided	N
	- test at 30N		N
4.8	Switches:	No switch provided	N
	- adequate rating		N
	- adequate fixing		N
	- polarized supply		N
	- compliance with 61058-1 for electronic switches		N
4.9	Insulating lining and sleeves		P
4.9.1	Retainement		P
	Method of fixing		P
4.9.2	Insulated linings and sleeves		N
	Resisant to a temperature >20℃ to the wire temperature or		N

EN 60598-2-1			
Clause	Requirement + Test	Result – Remark	Verdict
	a) & c) Insulation resistance and electric strength		N
	b) Ageing test. Temperature (℃)		N
4.10	Insulation of Class II luminaires		P
4.10.1	No contact, mounting surface – accessible metal Parts – wiring of basic insulation		P
	Safe installation fixed luminaires		N
	Capacitors and switches		N
	Interference suppression capacitors according to IEC 60384-14		N
4.10.2	Assemble gaps		N
	- not concidental		N
	- no straight access with test probe		N
4.10.3	Retainment of insulation		P
	- fixed		P
	- unable to be replaced;luminaire inoperative		N
	- sleeves retained in position		N
	- lining in lampholder		N
4.11	Electrical connections		P
4.11.1	Contact pressure		P
4.11.2	Screw		N
	- self-tapping screws		N
	- thread-cutting screws		N
4.11.3	Screw locking		N
	- spring washer		N
	- rivets		N
4.11.4	Material of current-carring parts		P
4.11.5	No contact to wood or mounting surface		P
4.11.6	Electron-mechanical contact systems		N
4.12	Mechanical connections and glands		P
4.12.1	Screws not made of soft metal		P
	Screws of insulating material		N
	Torque test: torque(Nm); part	Φ3.71mm for fixed arms, 1.2Nm, no damage	P
4.12.2	Screw with diameter < 3 mm screwed into metal		N
4.12.4	Locked connections		N

EN 60598-2-1			
Clause	Requirement + Test	Result – Remark	Verdict
	- fixed arms; torque (Nm)	Φ3.71mm for fixed arms, 2.5Nm, no damage	N
	- lampholder; torque (Nm)		N
	- push-button switch; torque 0.8 Nm		N
4.12.5	Screwed glands; force (Nm)		N
4.13	Mechnical strength		P
4.13.1	Impact test		P
	- fragile parts; energy (Nm)		N
	- other parts; energy (Nm)	Luminaire enclosure enclosure: 0.35Nm	P
	1) live parts		P
	2) linings		N
	3) protection		P
	4) covers		P
4.13.3	Straight test finger		P
4.13.4	Routh service luminaires		N
	- IP54 or higher		N
	a) fixed		N
	b) hand-held		N
	c) delivered with a stand		N
	d) for temperorary installatons and suitable for monting on a stand		N
4.13.6	Tumbling barrel		N
4.14	Suspensions and adjusting devices		P
4.14.1	Mechanical load		P
	A) four times the weight		P
	B) torque 2.5 Nm		N
	C) bracket arm; bending moment (Nm)		N
	D) load track-monted 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
4.14.2	Load to flexible cable		N
	Mass (kg)		N
	Stress in conductors (N/mm^2)		N

EN 60598-2-1			
Clause	Requirement + Test	Result – Remark	Verdict
	Mass(kg) of semi-luminaire		N
	Bending monment (Nm) of semi-luminaire		N
4.14.3	Adjusting devices	No adjusting devices provided	N
	- flexing test; number cycles		N
	- strands broken		N
	- electric strength test afterwards		N
4.14.4	Telescopic tubes: cord not fixed to tube; no strain on conductors		N
4.14.5	Guide pulleys		N
4.14.6	Strain on socket-outlets		N
4.15	Flammable materials		N
	- glow-wire test 650℃		N
	- spacing ≥ 30mm		N
	- screen withstanding test of 13.3.1		N
	- screen dimensions		N
	- no fiercely burning material		N
	- thermal protection		N
	- electronic circuits exempted		N
4.15.2	Luminaires made of thermoplastic material with lamp control gear		N
	a) construction		N
	b) temperture sensing control		N
	c) surface temperature		N
4.16	Luminaires for mounting on normally flammable surfaces		P
	No lamp control gear		N
4.16.1	Lamp control gear spacing		P
	- spacing 35 mm		N
	- spacing 10 mm		N
4.16.2	Thermal protection		N
	- in lamp control gear		N
	- external		N
	- fixed position		N
	- temperature marked lamp		N
	- control gear		N
4.16.3	- Design to satisfy the test of 12.6		N
4.17	Drain holes		N

EN 60598-2-1			
Clause	Requirement + Test	Result – Remark	Verdict
	Clearance at least 5 mm		N
4.18	Resistance to corrosion		N
4.18.1	- rust-resistance		N
4.18.2	- season cracking in copper		N
4.18.3	- corrosion of aluminium		N
4.19	Igniors compatible with ballast	No igniors provided	N
4.20	Rough service vibration		N
4.21	Protective shield		N
4.21.1	Shield fitted		N
	Shield of glass if tungsten halogen lamps		N
4.21.2	Particles from a shattering lamp not impaire safety		N
4.21.3	Nor direct path		N
4.21.4	Impact test on shield		N
	Glow-wire test on lamp compartment		N
4.22	Attachments ot lamps	See “general product” information” for details	P
4.23	Semi-luminaires comply Class II		N
4.24	UV radiation for tungsten halogen lamps and metal halide lamps (Annex P)		N
4.25	No sharp point or edges		P
4.26	Short-circuit protection		P
4.26.1	Uninsulated accessible SELV parts		N
4.26.2	Short-circuit test		N
4.26.3	Test chain accoridng to Figure 29		N

11	CREEPAGE DISTANXES AND CLEARANCES		—
	Working voltage (V)……..:	100-277 VAC (input of LED power supply);	—
	Voltage form	Sinusoidal ☒ Non-sinusoidal ☐	—
	PTI	<600 ☒ ≥600 ☐	—
	Impulse withstand category (Normal category II) (Category III Annex U)	Category II ☒ category III ☐	—
	Rated pulse voltage (kV)……:		—

EN 60598-2-1			
Clause	Requirement + Test	Result – Remark	Verdict
	(1) current-carrying parts of different polarity: cr(mm); cl(mm)…….:		N
	(2) Current-carrying parts and accessible parts: cr(mm); cl(mm)…….:		N
	(3) Parts becoming live due to breakdown of basic insulation and metal parts: Cr (cc); 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
7	**PROVISION FOR EARTHING**		—
7.2.1+7.2.3	Accessible metal parts		P
	Metal parts in cotact with supporting surface		P
	Resistance < 0.5 Ω		P
	Self-tapping screws used		N
	Thread-forming screws		N
	Thread-forming screw used in a grove		N
	Earth makes contact first		N
7.2.2+7.2.3	Earth continuity in joints etc.		P
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
7.2.5	Earth terminal integral part of connector socket		P
7.2.6	Earth terminal adjacent to mains terminals		P
7.2.7	Electrolytic corrosion of the earth terminal		P
7.2.8	Material of earth terminal		P
	Contact surface bare metal		P
7.2.10	Class II luminaire for looping-in		N

EN 60598-2-1			
Clause	Requirement + Test	Result – Remark	Verdict
	Couble or reinforced insulation to functional earth		N
7.2.11	Earthing core coloured green-yellow		P
	Length of earth conductor		P
14	**SCREW TERMINALS**		–
	Separately approved; commponent list	(see Annex 1)	N
	Part of the luminaire	(see Annex 3)	N
15	**SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS**		–
	Separately approved; commponent list		N
	Part of the luminaire		N
5	**EXTERNAL AND INTERNAL WIRING**		–
5.2	Supply connection and external wiring		P
5.2.1	Means of connection……:	Connecting leads	P
5.2.2	Type of cable……:	See annex 1	P
	Nominal cross-sectional area (mm^2)……..:		P
	Cables equal to HD21 S2 or HD22 S2		N
5.2.3	Type of attachment, X, Y or Z	Type Y	P
5.2.5	Type Z not connected to screws		N
5.2.6	Cable entries:		P
	- suitable for introduction		P
	- adquate degree of protection		P
5.2.7	Cable entries through rigid material have rounded edges		P
5.2.8	Insulating bushings:		P
	- suitably fixed		P
	- material in bushings		P
	- material not likedly to deteriorate		P
	- tubes or guards made of insulation material		P
5.2.9	Locking of screwed bushings		N
5.2.10	Cord anchorage:		N
	- covering protected from abrasion		N

EN 60598-2-1			
Clause	Requirement + Test	Result – Remark	Verdict
	- 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
5.2.10.1	Cord anchorage for type X attachment:		N
	a) at least one part fixed		N
	b) types of cable		N
	c) no damaging of the cable		N
	d) whole cable can be mounted		N
	e) no touching of clamping screws		N
	f) metal screw not directly on cable		N
	g) replacement without special tool		N
	Glands not used as anchorage		N
	Labyrinth type anchorages		N
5.2.10.2	Adequate cord anchorage for type Y and type Z attachment		N
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 ≤ 2mm		N
	- no damage of cable or cord		N
5.2.11	External wiring passing into luminaire		P
5.2.12	Looping-in terminals		N
5.2.13	Wire ends not tinned		N
	Wire ends tinned: no cold flow		N
5.2.14	Mains plug same protection		N
	Class III luminaire plug		N
5.2.16	Appliance inlets (IEC 60320)		N
	Appliance couplers of class II type		N
5.2.17	No standardized interconnecting cables properly assembled		N
5.2.18	Used plug in accordance with		N
	- IEC 60083		N
	- other standard		N

EN 60598-2-1			
Clause	Requirement + Test	Result – Remark	Verdict
5.3	Internal wiring	See annex 1	P
5.3.1	Internal wiring of suitable size and type	See annex 1	P
	Through wiring		N
	- not delivered/ mounting instruction		N
	- factory assembled		N
	- socket outlet loaded (A)……:		N
	- temperatures .....:	(See annex 2)	N
	Green-yellow for earth only		N
5.3.1.1	Internal wiring connected directly to fixed wiring		N
	Cross-sectional area (mm²) .....:		N
	Insulation thickness		N
	Extra insulation added where necessary		N
5.3.1.2	Internal wiring connected to fixed wiring via internal current-limiting device		N
	Adequate cross-sectional area and insulation thickness		N
5.3.1.3	Double or reinforced insulation for class II		P
5.3.1.4	Conductors without insulation		N
5.3.1.5	SELV current-carrying parts		P
5.3.1.6	Insulation thickness other than PVC or rubber		N
5.3.2	Sharp edges etc.		P
	No moving parts of switches etc.		N
	Joints, raising/lowering devices		N
	Telescopic tubes etc.		N
	No twisting over 360°		P
5.3.3	Insulating bushings:		N
	- suitable fixed		N
	- material in bushings		N
	- material not likely to deteriorate		N
	- cables with protective sheath		N
5.3.4	Joints and junctions effectively insulated		P
5.3.5	Strain on internal wiring		P
5.3.6	Wire carriers		P
5.3.7	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N

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

8	**PROTECTION AGAINST ELECTRIC SHOCK**		—
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
	Lampholders 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
8.2.2	Portable luminaire adjusted in most unfavourable position	Fixed luminaire	N
8.2.3.a	Class II luminaire:		P
	- basic insulated metal parts not accessible during starter or lamp replacement		N
	- basic insulation not accessible other than during starter or lamp replacement		N
	- glass protective shields not used as supplementary insulation		N
8.2.3.b	BC lampholder of metal in class I luminaires shall be earthed	No lampholder provided	N
8.2.3.c	Class III luminaires with exposed SELV parts:	Class II luminaire	N
	Ordinary luminaire:		N
	- touch current .....:		N
	- no-load voltage.....:		N
	Other than ordinary luminaire:		N
	- nominal voltage .....:		N
8.2.4	Portable luminaire:	Fixed luminaire	N
	- protection independent of supporting surface		N
	- terminal block completely covered		N
8.2.5	Compliance with the standard test finger or relevant probe		P

EN 60598-2-1			
Clause	Requirement + Test	Result – Remark	Verdict
8.2.6	Covers reliably secured		P
8.2.7	Discharging of capacitors ≥ 0,5 μF		N
	Portable plug connected luminaire with capacitor		N
	Other plug connected luminaire with capacitor		N
	Discharge device on or within capacitor		N
	Discharge device mounted separately		N
12	**ENDURANCE TEST AND THERMAL TEST**		—
12.3	Endurance test:		P
	- mounting-position .....:	As in normal use	—
	- test temperature (°C).....:	35 °C	—
	- total duration (h) .....:	168h	—
	- supply voltage: Un factor; calculated voltage (V).....:	291.5V	—
	- lamp used.....:	LED module	—
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
12.4	Thermal test (normal operation)	(see Annex 2)	P
12.5	Thermal test (abnormal operation)	(see Annex 2)	N
12.6	Thermal test (failed lamp control gear condition):		N
12.6.1	Through wiring or looping-in wiring loaded by a current of (A) .....:		—
	- case of abnormal conditions.....:		—
	- electronic lamp control gear		N
	- measured winding temperature (°C): at 1,1 Un .....:		—
	- measured mounting surface temperature (°C) at 1,1 Un.....:		N
	- calculated mounting surface temperature (°C) :		N
	- track-mounted luminaires		N
12.6.2	Temperature sensing control		N
	- case of abnormal conditions.....:		—
	- thermal link		N

EN 60598-2-1			
Clause	Requirement + Test	Result – Remark	Verdict
	- manual reset cut-out		N
	- auto reset cut-out		N
	- measured mounting surface temperature (°C):		N
	- track-mounted luminaires		N
12.7	Thermal test (failed lamp control gear in plastic luminaires):		N
12.7.1	Luminaire without temperature sensing control		N
12.7.1.1	Luminaire with fluorescent lamp ≤ 70W		N
	Test method 12.7.1.1 or Annex V .....:		—
	Test according to 12.7.1.1:		N
	- case of abnormal conditions		—
	- Ballast failure at supply voltage (V) .....:		—
	- Components retained in place after the test		N
	- Test with standard test finger after the test		N
	Test according to Annex V:		N
	- case of abnormal conditions		—
	- measured winding temperature (°C): at 1,1 Un .....:		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un .....:		—
	- calculated temperature of fixing point/exposed part (°C).....:		—
	Ball-pressure test:		N
	- part tested; temperature (°C).....:		N
	- part tested; temperature (°C).....:		N
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
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

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Clause	Requirement + Test	Result – Remark	Verdict
	- Test with standard test finger after the test		N
12.7.2	Luminaire with temperature sensing control		N
	- thermal link	Yes ☐ No ☐	—
	- manual reset cut-out	Yes ☐ No ☐	—
	- auto reset cut-out	Yes ☐ No ☐	—
	- case of abnormal conditions		—
	- highest measured temperature of fixing point/exposed part (°C):.....:		—
	Ball-pressure test:		N
	- part tested; temperature (°C).....:		N
	- part tested; temperature (°C).....:		N
9	**RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE**		P
	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP .....:	IP65	—
	- mounting position during test.....:	As in normal use	—
	- fixing screws tightened; torque (Nm).....:	--	—
	- tests according to clauses .....:	Clause 9.2.0	—
	- electric strength test afterwards		N
	a) no deposit in dust-proof luminaire		N
	b) no talcum in dust-tight luminaire		N
	c) no trace of water on current-carrying parts or SELV parts or where it could become a hazard		N
	d) i) For luminaires without drain holes – no water entry		N
	d) ii) For luminaires with drain holes – no hazardous water entry		N
	e) no water in watertight luminaire		N
	f) no contact with live parts (IP 2X)		N
	f) no entry into enclosure (IP 3X and IP 4X)		N
	f) no contact with live parts (IP3X and IP4X)		N
	g) no trace of water on part of lamp requiring protection from splashing water		N
	h) no damage of protective shield or glass envelope		N
9.3	Humidity test 48 h	25°C; 93%R.H.	P
10	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		—
10.2.1	Insulation resistance test		P

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Clause	Requirement + Test	Result – Remark	Verdict
	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.....:	100MΩ (limit 1MΩ)	P
	- between current-carrying parts and mounting surface.....:	100MΩ (limit 1MΩ)	P
	- between current-carrying parts and metal parts of the luminaire.....:	100MΩ (limit 1MΩ)	P
	Other than SELV:		P
	- between live parts of different polarity .....:	500MΩ (limit 2MΩ)	P
	- between live parts and mounting surface .....:	500MΩ (limit 4MΩ)	P
	- between live parts and metal parts.....:	500MΩ (limit 4MΩ)	P
	- between live parts of different polarity through action of a switch.....:		N
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.....:	500V	P
	- between current-carrying parts and mounting surface.....:	500V	P
	- between current-carrying parts and metal parts of the luminaire.....:	500V	P
	Other than SELV:		P
	- between live parts of different polarity .....:	1554V	P
	- between live parts and mounting surface .....:	3108V	P
	- between live parts and metal parts.....:	1554V	P
	- between live parts of different polarity through action of a switch.....:		N
	Input to output of LED driver		N
	Input to enclosure of LED driver		N
10.3	Touch current (mA).....:	Limit value: 0.7mA, measured value: 0.14mA	P

13	**RESISTANCE TO HEAT, FIRE AND TRACKING**		—
13.2.1	Ball-pressure test:		P

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Clause	Requirement + Test	Result – Remark	Verdict
	- part tested; temperature (°C)……:	Plastic material of wiring terminal: 125 °C	P
	- part tested; temperature (°C)……:		N
	- part tested; temperature (°C)……:		N
	- part tested; temperature (°C)……:		N
13.3.1	Needle flame test (10 s):		N
	- part tested .....:		N
13.3.2	Glow-wire test (650°C):		N
	- part tested .....:		N
13.4.1	Tracking test: part tested .....:		N

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Clause	Requirement + Test	Result – Remark	Verdict

	ANNEX 1: components	P

Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard	Mark(s) of conformity
LED driver	MEAN WELL	HLG-240H-36A	Input:100-277V~, 50/60Hz Output:DC 36V, 6.7A	EN 61347-2-13	CE
output lead wire	Various	Various	600V, 105 °C VW-1, 2X0.75mm^2	--	VDE

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

	ANNEX 2: temperature measurements, thermal tests of Section 12		P

	Type reference.....:	SV-HBCOB80W	—
	Lamp used .....:	LED	—
	Lamp control gear used .....:	Electronic LED driver	—
	Mounting position of luminaire .....:	As in normal use	—
	Supply wattage (W).....:	--	—
	Supply current (A).....:	--	—
	Calculated power factor .....:	--	—
	Table: measured temperatures corrected for ta = 25 °C:		N
	- abnormal operating mode.....:	--	—
	- test 1: rated voltage .....:	Test 1 : 100V	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage .....:	Test 2 : 277*1.06=293.6V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage.....:	--	—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage .....:	--	—
	Through wiring or looping-in wiring loaded by a current of A during the test .....:	--	—

temperature (°C) of part	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1	test 2	test 3	limit	test 4	Limit
Input lead wire	42.9	50.3	--	80	--	--
Enclosure of LED driver	53.2	61.9	--	Ref.	--	--
Output lead wire	27.2	27.2	--	80	--	--
Mounting surface	43.0	42.9	--	90	--	--
Metal enclosure	54.0	54.7	--	90	--	--
Ambient	25.2	25.1	--	--	--	--

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

	ANNEX 3: screw terminals (part of the luminaire)	N

(14)	**SCREW TERMINALS**		—
(14.2)	Type of terminal .....:		—
	Rated current (A) .....:		—
(14.3.2.1)	One or more conductors		N
(14.3.2.2)	Special preparation		N
(14.3.2.3)	Terminal size		N
	Cross-sectional area (mm²) .....:		N
(14.3.3)	Conductor space (mm) .....:		N
(14.4)	Mechanical tests		N
(14.4.1)	Minimum distance		N
(14.4.2)	Cannot slip out		N
(14.4.3)	Special preparation		N
(14.4.4)	Nominal diameter of thread (metric ISO thread) .....:		N
	External wiring		N
	No soft metal		P
(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).....:		P
(14.4.8)	Without undue damage		P

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

	ANNEX 4: screwless terminals (part of the luminaire)	N

(15)	**SCREWLESS TERMINALS**		—
(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 10^{th} alt. 25^{th} cycle (4 samples).....:		N
	Voltage drop (mV) after 50^{th} alt. 100^{th} cycle (4 samples).....:		N
	After ageing, voltage drop (mV) after 10^{th} alt. 25^{th} cycle (4 samples).....:		N
	After ageing, voltage drop (mV) after 50^{th} alt. 100^{th} cycle (4 samples).....:		N
(15.7)	Terminals external wiring		N

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

	Terminal size and rating										N
(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										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
	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)	--	--	--	--	--	--	--	--	--	--	

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

TTACHMENT TO TEST REPORT EN 60598-2-1 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES Luminaires Part 2: Particular requirements: Section one – Fixed general purpose luminaries
Differences according……..: EN 60598-2-1: 1989 used in conjunction with EN 60598-1: 2008 + A11:2009

	CENELEC COMMON MODIFICATIONS (EN)		—
3	**MARKING**		—
3.3.101	Adequate warning on the package		P
4	**CONSTRUCTION**		—
4.11.6	Electro-mechanical contact systems		N
5	**EXTERNAL AND INTERNAL WIRING**		—
5.2.1	Connection leads		N
	- without a means for connection to the supply		N
	- terminal block specified		N
	- relevant information provided		N
	- compliance with 4.6, 4.7.1, 4.7.2, 4.10.1, 11.2, 12 and 13.2 of part 1		N
5.2.2	Cables equal to HD21 S2 of HD22 S2		N
12	**ENDURANCE TEST AND THERMAL TEST**		—
12.4.2c	Thermal test (normal operation)		P
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
(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

EN 60598-2-1			
Clause	Requirement + Test	Result – Remark	Verdict
(13.3)	GB: Requirements according to United Kingdom Building Regulation		N

EN 62031			
Clause	Requirement + Test	Result – Remark	Verdict
4	**GENERAL REQUIREMENTS**		—
4.4	Integral modules treated as part of luminaires defined in clause 0.5 of IEC 60598-1	Yes ☒ No ☐	—
4.5	Independent modules complies with requirements in IEC 60598-1	Yes ☐ No ☒	—
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 ☒ No ☐	—
	Independent module ..... :	Yes ☐ No ☒	—
	Integral module ..... :	Yes ☐ No ☒	—
	For Integral module; Note to 1.2.1 in IEC 60598-1 applies.		—
7	**MARKING**		N
	Requirements not applicable to the evaluated product.		—
8	**SCREW TERMINALS**		—
	Compliance with section 14 of IEC 60598-1		N
	SCREWLESS TERMINALS		—
	Compliance with section 15 of IEC 60598-1		P
	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.		—

EN 62031			
Clause	Requirement + Test	Result – Remark	Verdict
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

EN 62031			
Clause	Requirement + Test	Result – Remark	Verdict
B	**ANNEX B - SELV-operated LED modules**		—
	SLVE-operated LED modules in compliance with Annex I of IEC 61347-2-13		N

EUT Photos

Photo 1 View of EUT

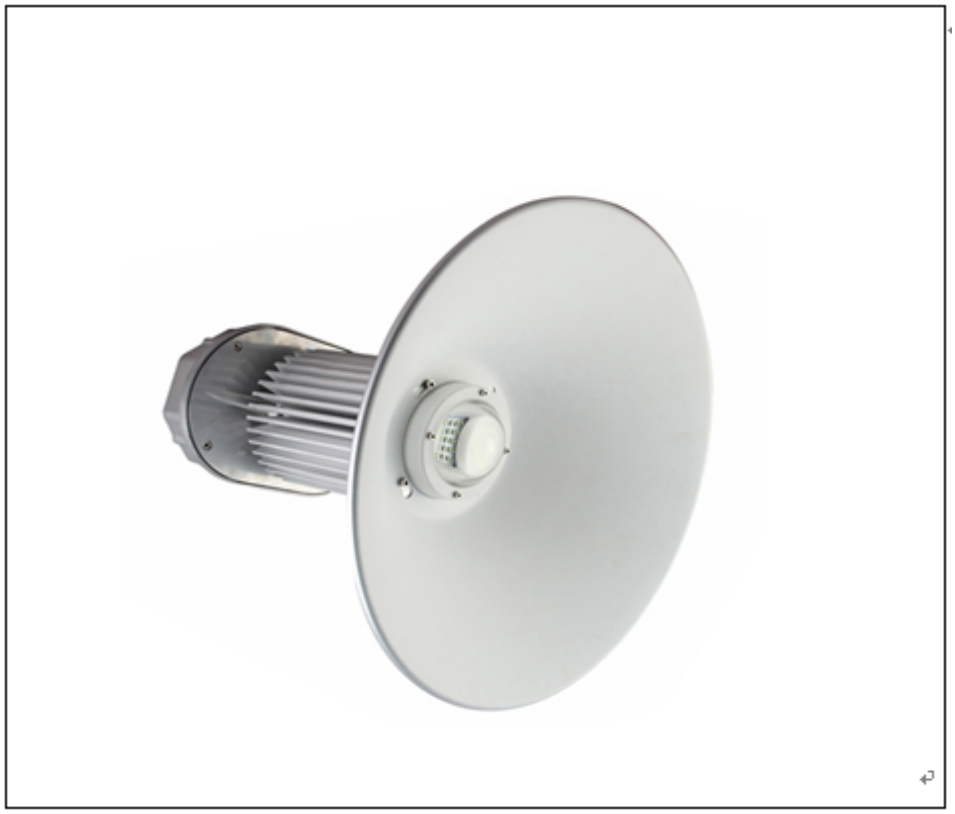
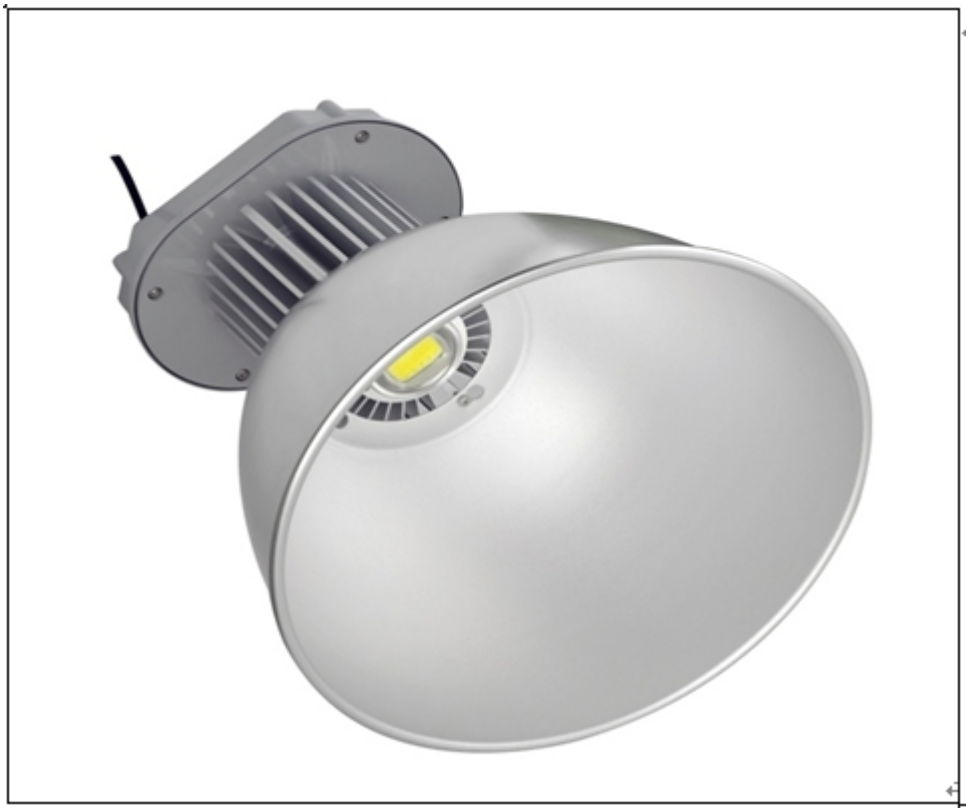


Photo 2 View of EUT



END OF REPORT