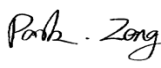
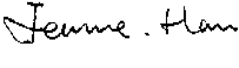


TEST REPORT AS/NZS 60598.2.1 Luminaires Part 2: Particular requirements:—Fixed general purpose luminaires	
Report Reference No.	RSZ160822550-03
Compiled by (+ signature)	Park Zeng 
Approved by (+ signature)	Jeanne Han 
Date of issue	2016-09-08
Testing Laboratory	Bay Area Compliance Laboratories Corp. (Shenzhen)
Address	6/F., Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong 518038, China
Testing location	Same as above
Applicant's name	Yaham Optoelectronics Co., Ltd
Address	#118 Yongfu Road, Fuyong Town, Baoan District, Shenzhen, P.R.China
Standard	AS/NZS 60598.1:2013 AS/NZS 60598.2.1:2014 IEC 62031:2008+A1:2012 IEC 62471:2006
Test sample(s) received.....	2016-08-22
Test in period.....	2016-08-22 to 2016-09-08
Procedure deviation	AS/NZS standard
Non-standard test method.....	N/A
Note: The test data was only valid for the test sample(s). This test report is prepared for the customer shown above and for the specific product described herein. It must not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Shenzhen). This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Federal Government. This report may contain data or test methods that are not covered by the NVLAP accreditation scope and shall be marked with an asterisk "*" and noted.	
Test item description	LED HIGHBAY
Trade Mark	COMPACT II LED HIGH BAY
Manufacturer	Yaham Optoelectronics Co., Ltd
Address	#118 Yongfu Road, Fuyong Town, Baoan District, Shenzhen, P.R.China
Model/Type reference	YHL-ID-180-HB-VE, YHL-ID-200-HB-VE(IR)
Multitple type	YHL-ID-60-HB-VE, YHL-ID-80-HB-VE, YHL-ID-100-HB-VE, YHL-ID-120-HB-VE, YHL-ID-150-HB-VE, YHL-ID-60-HB-VE(IR), YHL-ID-80-HB-VE(IR), YHL-ID-100-HB-VE(IR), YHL-ID-120-HB-VE(IR), YHL-ID-150-HB-VE(IR), YHL-ID-180-HB-VE(IR)
Ratings	YHL-ID-180-HB-VE: Input: AC100 - 240V, 50/60Hz, Ta:50 °C , Power:180W, IP65 YHL-ID-200-HB-VE(IR): Input: AC100 - 240V, 50/60Hz, Ta:50°C, Power:200W, IP65

Copy of marking plate (for example):

LED HIGHBAY	
Product Code: YHL-ID-200-HB-VE	Color Temp: 4500-5500K
Input Voltage: AC100-240V	IP Rating: IP65 Ta: 50°C
Power Frequency: 50/60Hz	N.W.: 4.3kg
Power: 180W	NO.: 16061400001
Date: 2016-05-15	

LED HIGHBAY	
Product Code: YHL-ID-200-HB-VE(IR)	Color Temp: 4500-5500K
Input Voltage: AC100-240V	IP Rating: IP65 Ta: 50°C
Power Frequency: 50/60Hz	N.W.: 4.3kg
Power: 200W	NO.: 16061400001
Date: 2016-05-15	

Test item particulars

Classification of installation and use : Class I

Supply Connection : Type Y attachment

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 remarks:

"(see remark #)" refers to a remark appended to the report.

(see appended table)" refers to a table appended to the report.

Throughout this report a comma is used as the decimal separator.

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 testing laboratory.

Appendix A

AUSTRALIA / NEW ZEALAND DIFFERENCES test results according to IEC 60598-2-1(ed.1.0)

Appendix ZZ

VARIATIONS TO IEC 60598.1, Ed. 7.0 (2008) FOR AUSTRALIA AND NEW ZEALAND (Normative)

Appendix B

(AUSTRALIA / NEW ZEALAND) NATIONAL DIFFERENCES according to AS/NZS IEC 61347.2.13:2013

Appendix C: (AUSTRALIA / NEW ZEALAND) NATIONAL DIFFERENCES according to AS/NZS 61347.1: 2002.

Attachment No.1:

Test report for IEC 62031

Attachment No.2:

Test report for IEC 62471

Test result: **Exempt Group**

Attachment No.3:

Manual instruction

Attachment No.4:

EUT Photos

Attachment No.5:

Circuit schematics diagram and PCB layout diagram

Attachment No. 6:

Attachment 6 Wire connector certification

Attachment No. 7:

Equipment list

General product information:

Class I equipment, LED High Bay Light for general lighting service. The luminaire is IP65 rated and widely used in Factory, Workshop, Warehouse, Logistics Center, Exhibition Hall, Gymnasium, Shipyards, Mining, Gas Station, Supermarket, and other places.

Model	Input	Power(W)	LED number	Size	Driver	Output of driver	LED
YHL-ID-60-HB-VE	100-240VAC 50/60Hz	60W	135PCS	220*220*195	HBG-60-36A	30V 1.85A	NF2W757GR
YHL-ID-80-HB-VE		80W	170PCS	220*220*195	HBG-100-36A	30V 2.5A	NF2W757GR
YHL-ID-100-HB-VE		100W	210PCS	220*220*195	HBG-100-36A	30V 3.1A	NF2W757GR
YHL-ID-120-HB-VE		120W	250PCS	220*220*195	HBG-160-36A	30V 3.8A	NF2W757GR
YHL-ID-150-HB-VE		150W	320PCS	280*280*262	HBG-160-36A	30V 4.7A	NF2W757GR
YHL-ID-180-HB-VE		180W	380PCS	280*280*262	HBG-240-36A	30V 5.6A	NF2W757GR
YHL-ID-60-HB-VE(IR)		60W	135PCS	220*220*195	EUR-096S350SV	30V 1.9A	NF2W757GR
YHL-ID-80-HB-VE(IR)		80W	170PCS	220*220*195	EUR-096S350SV	30V 2.5A	NF2W757GR
YHL-ID-100-HB-VE(IR)		100W	210PCS	220*220*195	EUR-096S350SV	30V 3.1A	NF2W757GR
YHL-ID-120-HB-VE(IR)		120W	250PCS	220*220*195	EUR-150S560SV	30V 3.8A	NF2W757GR
YHL-ID-150-HB-VE(IR)		150W	320PCS	280*280*262	EUR-150S560SV	30V 4.7A	NF2W757GR
YHL-ID-180-HB-VE(IR)		180W	380PCS	280*280*262	EUR-240S670SV	30V 5.6A	NF2W757GR
YHL-ID-200-HB-VE(IR)		200W	420PCS	280*280*262	EUR-240S670SV	30V 6.2A	NF2W757GR

Unless other specified, the model YHL-ID-180-HB-VE and YHL-ID-200-HB-VE(IR) were chosen as the representative models to perform all tests.

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict

1.2 (0)	GENERAL TEST REQUIREMENTS		P
1.2 (0.1)	Information for luminaires design considered	Standard Yes ☒ No ☐	—
1.2 (0.3)	More sections applicable	Yes ☐ No ☒	—

1.4 (2)	CLASSIFICATION		P
1.4 (2.2)	Type of protection	Class I luminaires	—
1.4 (2.3)	Degree of protection :	IP65	—
1.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces :	Yes ☒ No ☐	—
1.4 (2.5)	Luminaire for normal use :	Yes ☒ No ☐	—
	Luminaire for rough service :	Yes ☐ No ☒	—

1.5 (3)	MARKING		P
1.5 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text	See marking	P
1.5 (3.3)	Additional information		P
	Language of instructions	English	P
1.5 (3.3.1)	Combination luminaires	Not combination luminaires	N
1.5 (3.3.2)	Nominal frequency in Hz	50/60Hz	P
1.5 (3.3.3)	Operating temperature	Ta:50°C	P
1.5 (3.3.4)	Symbol or warning notice		N
1.5 (3.3.5)	Wiring diagram		N
1.5 (3.3.6)	Special conditions		N
1.5 (3.3.7)	Metal halide lamp luminaire – warning	No such luminaire	N
1.5 (3.3.8)	Limitation for semi-luminaires	Not semi-luminaires	N
1.5 (3.3.9)	Power factor and supply current		N
1.5 (3.3.11)	Luminaires with remote control	Luminaires without remote control	N
1.5 (3.3.12)	Clip-mounted luminaire – warning	No such luminaire	N
1.5 (3.3.13)	Specifications of protective shields	No such shield	N
1.5 (3.3.14)	Symbol for nature of supply	AC	P
1.5 (3.3.15)	Rated current of socket outlet	No such device	N
1.5 (3.3.16)	Rough service luminaire	Not rough service luminaire	N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
1.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments	Type Y	P
1.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N
1.5 (3.3.19)	Protective conductor current in instruction if applicable		N
1.5 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N
-6	LED luminaires with G5 or G13 lampholders shall be marked with the following warning: WARNING: NOT FOR USE WITH ANY FLUORESCENT LAMP—FOR USE ONLY WITH TYPE X LED LAMPS		N
1.5 (3.4)	Test with water	15s	P
	Test with hexane	15s	P
	Legible after test		P
	Label attached		P
1.6 (4)	CONSTRUCTION		P
1.6 (4.2)	Components replaceable without difficulty		N
1.6 (4.3)	Wire ways smooth and free from sharp edges		P
1.6 (4.4)	Lampholders	No lampholder	N
1.6 (4.4.1)	Integral lampholder		N
1.6 (4.4.2)	Wiring connection		N
1.6 (4.4.3)	Lampholder for end-to-end mounting		N
1.6 (4.4.4)	Positioning		N
	- pressure test (N)		N
	- bending test (Nm)		N
1.6 (4.4.5)	Peak pulse voltage		N
1.6 (4.4.6)	Centre contact		N
1.6 (4.4.7)	Parts in rough service luminaires resistance to tracking		N
1.6 (4.4.8)	Lamp connectors		N
1.6 (4.4.9)	Caps and bases correctly used		N
1.6 (4.5)	Starter holders	No starter holder	N
	Starter holder in luminaires other than class II		N
	Starter holder class II construction		N
1.6 (4.6)	Terminal blocks		N
	Tails		N
	Unsecured blocks		N
1.6 (4.7)	Terminals and supply connections		P
1.6 (4.7.1)	Contact to metal parts		P

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.7.2)	Test 8 mm live conductor		P
	Test 8 mm earth conductor		P
1.6 (4.7.3)	Terminals for supply conductors		P
1.6 (4.7.3.1)	Welded connections:		P
	- stranded or solid conductor		P
	- spot welding		N
	- welding between wires		N
	- Type Z attachment		N
	- mechanical test according to 15.8.2		P
	- electrical test according to 15.9		P
	- ageing test according to 15.9.2.3 and 15.9.2.4		P
1.6 (4.7.4)	Terminals other than supply connection		N
1.6 (4.7.5)	Heat-resistant wiring/sleeves	No such sleeve	N
1.6 (4.7.6)	Multi-pole plug	Not multi-pole plug	N
	- test at 30 N		N
1.6 (4.8)	Switches	No such device	N
	- adequate rating		N
	- adequate fixing		N
	- polarized supply		N
	- compliance with 61058-1 for electronic switches		N
1.6 (4.9)	Insulating lining and sleeves		N
1.6 (4.9.1)	Retainment		N
	Method of fixing		N
1.6 (4.9.2)	Insulated linings and sleeves		N
	a) & c) Insulation resistance and electric strength		N
	b) Ageing test. Temperature (°C)		N
1.6 (4.10)	Insulation of Class II luminaries	Class I luminaires	N
1.6 (4.10.1)	No contact, mounting surface - accessible metal parts - wiring of basic insulation		N
	Safe installation		N
	Capacitors and switches		N
	Interference suppression capacitors according to IEC 60384-14		N
1.6 (4.10.2)	Assembly gaps:		P
	- not coincidental		N
	- no straight access with test probe		P
1.6 (4.10.3)	Retainment of insulation:		N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
	- fixed		N
	- unable to be replaced; luminaire inoperative		N
	- sleeves retained in position		N
	- lining in lampholder		N
1.6 (4.11)	Electrical connections		P
1.6 (4.11.1)	Contact pressure		P
1.6 (4.11.2)	Screws:		P
	- self-tapping screws		P
	- thread-cutting screws		N
1.6 (4.11.3)	Screw locking:		P
	- spring washer		P
	- rivets		N
1.6 (4.11.4)	Material of current-carrying parts		P
1.6 (4.11.5)	No contact to wood		P
1.6 (4.11.6)	Electro-mechanical contact systems	No such systems	N
1.6 (4.12)	Mechanical connections and glands		P
1.6 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N
	Torque test: torque (Nm); part	Screw for hook 11.66mm: 29.0Nm	P
	Torque test: torque (Nm); part	Screw for fix LED cover 3.01mm : 0.6 Nm	P
	Torque test: torque (Nm); part	Screw for fix driver 5.84mm:2.5Nm	P
	Torque test: torque (Nm); part	Screw for fix LED board :2.98mm 0.5Nm	P
	Torque test: torque (Nm); part	Screw for fix hangs plate 4.79mm 2.0Nm	P
1.6 (4.12.2)	Screws with diameter < 3mm screwed into metal		P
1.6 (4.12.4)	Locked connections:		N
	- fixed arms; torque (Nm).....	No arms	N
	- lampholder; torque (Nm).....	No lampholder	N
	- push-button switches; torque 0,8 Nm.....	No push-button switches	N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.12.5)	Screwed glands; force (N)	15N, the luminaire and the glands no damage	P
1.6 (4.13)	Mechanical strength		P
1.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm).....		N
	- other parts; energy (Nm)	Lamp shade:0.35Nm	P
	- other parts; energy (Nm)	LED cover:0.35Nm	P
	1) live parts		P
	2) linings	No such linings	N
	3) protection		P
	4) covers		P
1.6 (4.13.3)	Straight test finger		P
1.6 (4.13.4)	Rough service luminaires	Not rough service luminaires	N
	- IP54 or higher		N
	a) fixed		N
	b) hand-held		N
	c) delivered with a stand		N
	d) for temporary installations and suitable for mounting on a stand		N
1.6 (4.13.6)	Tumbling barrel	No direct-plug	N
1.6 (4.14)	Suspensions and adjusting devices		P
1.6 (4.14.1)	Mechanical load:		P
	A) four times the weight	Max. 4.61x4=18.44Kg	P
	B) torque 2,5Nm		P
	C) bracket arm; bending moment (Nm)		N
	D) load track-mounted luminaires	Not track-mounted luminaires	N
	E) clip-mounted luminaires, glass-shelve. Thickness (mm)	Not clip-mounted luminaires	N
	metal rod. Diameter (mm)		N
	Fixed luminaire or independent control gear without fixing devices		N
1.6 (4.14.2)	Load to flexible cables	No such cables	N
	Mass (kg)		N
	Stress in conductors (N/mm ²)		N
	Semi-luminaires – mass (kg)		N
	Semi-luminaires – bending moment (Nm)...		N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.14.3)	Adjusting devices:	No such device	N
	- flexing test; number of cycles		N
	- strands broken		N
	- electric strength test afterwards		N
1.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors	No such tube	N
1.6 (4.14.5)	Guide pulleys		N
1.6 (4.14.6)	Strain on socket-outlets	No such device	N
1.6 (4.15)	Flammable materials:		P
	- glow-wire test 650°C	See clause 13.3.2	P
	- spacing $\geq 30\text{mm}$		N
	- screen withstanding test of 13.3.1		N
	- screen dimensions		N
	- no fiercely burning material		P
	- thermal protection	No such device	N
	- electronic circuits exempted		N
1.6 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		N
	a) construction		N
	b) temperature sensing control		N
	c) surface temperature		N
1.6 (4.16)	Luminaires for mounting on normally flammable surface		P
	A warning notice shall be marked on luminaires		N
	Luminaires not marked with the warning symbol		N
1.6 (4.16.1)	Lamp control gear spacing:		P
	- spacing 35mm		N
	- spacing 10mm		P
1.6 (4.16.2)	Thermal protection:		P
	- in lamp control gear		P
	- external		N
	- fixed position		N
	- temperature marked lamp control gear		P
1.6 (4.16.3)	It shall be so designed that it satisfied the tests of 12.6		N
1.6 (4.17)	Drain holes		N
	Clearance at least 5 mm		N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.18)	Resistance to corrosion:		P
1.6 (4.18.1)	- rust-resistance		P
1.6 (4.18.2)	- season cracking in copper		N
1.6 (4.18.3)	- corrosion of aluminium		N
1.6 (4.19)	Ignitors compatible with ballast	No such ignitors	N
1.6 (4.20)	Rough service vibration		N
1.6 (4.21)	Protective shield:	No such shield	N
1.6(4.21.1)	Shield fitted		N
1.6 (4.21.2)	Particles from a shattering lamp not impair safety		N
1.6 (4.21.3)	No direct path		N
1.6 (4.21.4)	Impact test on shield		N
	Glow-wire test on lamp compartment		N
1.6 (4.22)	Attachments to lamps	No such parts	N
1.6 (4.23)	Semi-luminaires comply class II	Not semi-luminaires	N
1.6 (4.24)	UV radiation, metal halide lamps		N
1.6 (4.25)	No sharp point or edges		P
1.6 (4.26)	Short-circuit protection:		N
1.6 (4.26.1)	Uninsulated accessible SELV parts		N
1.6 (4.26.2)	Short-circuit test		N
1.6 (4.26.3)	Test chain according to Figure 29		N
1.6 (4.27)	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N
	Pull test of terminal fixing (20 N)		N
	After test, resistance < 0,05 Ω		N
	Pull test of mechanical connection (50 N)		N
	After test, resistance < 0,05 Ω		N
	Voltage drop test, resistance < 0,05 Ω		N
-7	LED luminaires with G5 and G13 lampholders shall include a fuse to protect a fluorescent lamp that is inadvertently installed:		N
	(a) be of the 250 V HRC type;		N
	(b) have a 0.5 A max. quick-acting type rating; and		N
	(c) be used to protect a maximum of two lamps.		N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7 (11)	CREEPAGE DISTANCES AND CLEARANCES		P
	Working voltage (V)	100-240V~	—
	Voltage form	Sinusoidal ☒ Non-sinusoidal ☐	—
	PTI	< 600 ☒ ≥ 600 ☐	—
	Rated pulse voltage (kV)		—
	1) Current-carrying parts of different polarity: cr (mm); cl (mm).....	cr>2.5mm, cl>1.5mm limit cr:2.5mm cl:1.5mm Approved driver was used	P
	2) Current-carrying parts and accessible parts: cr (mm); cl (mm).....	cr>2.5mm, cl>1.5mm limit cr:2.5mm cl:1.5mm Approved driver was used	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) Live parts of switches: cr (mm); cl (mm) :	No such device	—
	6) Current-carrying parts and supporting surface: cr (mm); cl (mm).....		N
1.8 (7)	PROVISION FOR EARTHING		P
1.8 (7.2.1 +7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		P
	Resistance <0,5Ω	Max. 0.060Ω	P
	Two self-tapping screws used		P
	Thread-forming screws	No such screws	N
	Thread-forming screw used in a groove		N
	Earth makes contact first		P
1.8 (7.2.2 +7.2.3)	Earth continuity in joints etc.		N
1.8 (7.2.4)	Locking of clamping means		P
	Compliance with 4.7.3		P
1.8 (7.2.5)	Earth terminal integral part of connector socket		N
1.8 (7.2.6)	Earth terminal adjacent to mains terminals		P
1.8 (7.2.7)	Electrolytic corrosion of the earth terminal		P
1.8 (7.2.8)	Material of earth terminal		P
	Contact surface bare metal		P
1.8 (7.2.10)	Class II luminaire for looping-in	Class I luminaire	N
	Double or reinforced insulation to functional earth		N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
1.8 (7.2.11)	Earthing core coloured green-yellow		P
	Length of earth conductor		P
1.9 (14)	SCREW TERMINALS		P
	Separately approved; component list		N
	Part of the luminaire		N
1.9 (15)	SCREWLESS TERMINALS		N
	Separately approved; component list		N
	Part of the luminaire		N
1.10 (5)	EXTERNAL AND INTERNAL WIRING		P
1.10 (5.2)	Supply connection and external wiring		P
1.10 (5.2.1)	Means of connection.....:	Supply cord and Plug	P
1.10 (5.2.2)	Type of cable	H05VV-F	P
	Nominal cross-sectional area (mm ²).....:	3G1.0 mm ²	P
	Cables equal to IEC 60227 or IEC 60245	AS/NZS 60227	P
1.10 (5.2.3)	Type of attachment, X Y or Z	Type Y	P
1.10 (5.2.5)	Type Z not connected to screws		N
1.10 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
1.10 (5.2.7)	Cable entries through rigid material have rounded edges		P
1.10 (5.2.8)	Insulating bushings:		N
	- suitably fixed		N
	- material in bushings		N
	- material likely to deteriorate		N
	- tubes or guards made of insulating material		N
1.10 (5.2.9)	Locking of screwed bushings		N
1.10 (5.2.10)	Cord anchorage:		P
	- covering protected from abrasion		P
	- clear how to be effective		P

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
	- no mechanical or thermal stress		P
	- no tying of cables into knots etc.		P
	- insulating material or lining		P
1.10 (5.2.10.1)	Cord anchorage for type X attachment:	Type Y 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
1.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment	Type Y attachment	P
1.10 (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 ≤ 2 mm	Max. 1.24mm	P
	- no movement of conductors		P
	- no damage of cable or cord		P
1.10 (5.2.11)	External wiring passing into luminaire		P
1.10 (5.2.12)	Looping-in terminals	No such terminals	N
1.10 (5.2.13)	Wire ends not tinned		N
	Wire ends tinned: no cold flow		P
1.10 (5.2.14)	Mains plug same protection		P
	Class III luminaire plug		N
1.10 (5.2.16)	Appliance inlets (IEC 60320)	No such inlet	N
	Appliance couplers of class II type		N
1.10 (5.2.17)	No standardized interconnecting cables properly assembled		N
1.10 (5.2.18)	Used plug in accordance with		P
	- IEC 60083		N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
	- other standard	AS/NZS 3112	P
1.10 (5.3)	Internal wiring		P
1.10 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		N
	- not delivered/ mounting instruction		N
	- factory assembled		N
	- socket outlet loaded (A).....:		N
	- temperatures.....:		P
	Green-yellow for earth only		P
1.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P
	Cross-sectional area (mm ²)		N
	Insulation thickness		N
	Extra insulation added where necessary		N
1.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		P
	Adequate cross-sectional area and insulation thickness		P
1.10 (5.3.1.3)	Double or reinforced insulation for class II	Class I luminaire	N
1.10 (5.3.1.4)	Conductors without insulation	No such conductor	N
1.10 (5.3.1.5)	SELV current-carrying parts		P
1.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N
1.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.	No such device	N
	Joints, raising/lowering devices	No such device	N
	Telescopic tubes etc.		N
	No twisting over 360°		P
1.10 (5.3.3)	Insulating bushings:	No such luminaire	N
	- suitable fixed		N
	- material in bushings		N
	- material likely to deteriorate		N
	- cables with protective sheath		N
1.10 (5.3.4)	Joints and junctions effectively insulated		N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
1.10 (5.3.5)	Strain on internal wiring		N
1.10 (5.3.6)	Wire carriers	No such luminaire	N
1.10 (5.3.7)	Wire ends not tinned		N
	Wire ends tinned: no cold flow		P
1.11 (8)	PROTECTION AGAINST ELECTRIC SHOCK		P
1.11 (8.2.1)	Live parts not accessible		P
	Basic insulated parts not used on the outer surface without appropriate protection		P
	Basic insulated parts not accessible with standard test finger on portable and adjustable luminaires		P
	Basic insulated parts not accessible with Ø 50 mm probe from outside, within arm's 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	No such lamp	N
	Insulation lacquer not reliable		P
	Double-ended high pressure discharge lamp	No such lamp	N
	Relevant warning according to 3.2.18 fitted to the luminaire		N
1.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position	Not portable luminaire	N
1.11 (8.2.3.a)	Class II luminaire:	Class I 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
1.11 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N
1.11 (8.2.3.c)	Class III luminaires with exposed SELV parts:		N
	Ordinary luminaire:		N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
	- touch current :		N
	- no-load voltage :		N
	Other than ordinary luminaire:		N
	- nominal voltage :		N
1.11 (8.2.4)	Portable luminaire have protection independent of supporting surface		N
1.11 (8.2.5)	Compliance with the standard test finger or relevant probe		P
1.11 (8.2.6)	Covers reliably secured		P
1.11 (8.2.7)	Discharging of capacitors $\geq 0,5 \mu\text{F}$	See approved driver	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
1.12 (12)	ENDURANCE TEST AND THERMAL TEST		P
-12	Luminaires with an IP classification greater than IP20 shall be subjected to the relevant tests of Clauses 12.4, 12.5 and 12.6 of Section 12 of AS/NZS 60598.1 after the test(s) of Clause 9.2 but before the test(s) of Clause 9.3 of Section 9 of AS/NZS 60598.1 specified in Clause 14 of this Standard.		P
1.12 (12.3)	Endurance test:		P
	- mounting-position	Normal operation position	—
	- test temperature ($^{\circ}\text{C}$)	60 $^{\circ}\text{C}$	—
	- total duration (h)	240h	—
	- supply voltage: Un factor; calculated voltage (V)	1.1 times rated voltage :264V	—
	- lamp used	LED	—
1.12 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N
	- marking legible		P
	- no cracks, deformation etc.		P
1.12 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
1.12 (12.5)	Thermal test (abnormal operation)		N
1.12 (12.6)	Thermal test (failed lamp control gear condition):		N
1.12 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A) :		—
	- case of abnormal conditions :		—

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

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
	- case of abnormal conditions		—
	- measured winding temperature (°C): at 1,1 Un :		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un :		—
	- calculated temperature of fixing point/exposed part (°C) :		—
	Ball-pressure test:		N
	- part tested; temperature (°C) :		N
	- part tested; temperature (°C) :		N
1.12 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N
	- case of abnormal conditions		—
	- Components retained in place after the test		N
	- Test with standard test finger after the test		N
1.12 (12.7.2)	Luminaire with temperature sensing control	No such device	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

1.13 (9)	RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE		P
1.13 (-)	For luminaires with an IP classification greater than IP20 the order of the tests specified in Section 9 of AS/NZS 60598.1 shall be as specified in Clause 13 of this Standard.		P
1.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP	IP65	—
	- mounting position during test.....	As normal use way	—
	- fixing screws tightened; torque (Nm).....	-	—
	- tests according to clauses	9.2.2 and 9.2.6	—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		P
	b) no talcum in dust-tight luminaire		N
	c) no trace of water on current-carrying parts or where it could become a hazard		P

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Clause	Requirement + Test	Result - Remark	Verdict
	d) i) For luminaires without drain holes – no water entry		P
	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
1.13 (9.3)	Humidity test 48 h	25°C,93%RH	P
1.14 (10)	INSULATION RESISTANCE AND ELECTRIC STRENGTH		P
-14	Luminaire with an IP classification greater than IP20 the order of the test specified in section 9 of AS/NZS 60598.1 shall be as specified in clause 13 of this standard		P
1.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mmØ		—
	Insulation resistance (MΩ):		—
	SELV:		P
	- between current-carrying parts of different polarity	>100 MΩ	P
	- between current-carrying parts and mounting surface	>100 MΩ	P
	- between current-carrying parts and metal parts of the luminaire	>100 MΩ	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts		N
	- Insulation bushings as described in Section 5		N
	Other than SELV:		P
	- between live parts of different polarity	>100 MΩ	P
	- between live parts and mounting surface	>100 MΩ	P
	- between live parts and metal parts	>100 MΩ	P
	- between live parts of different polarity through action of a switch		N
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts		N
	- Insulation bushings as described in Section 5		N
1.14 (10.2.2)	Electric strength test		P
	Dummy lamp		N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
	Luminaires with ignitors after 24 h test		N
	Luminaires with manual ignitors		N
	Test voltage (V):		P
	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
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts		N
	- Insulation bushings as described in Section 5		N
	Other than SELV:		P
	- between live parts of different polarity	1480V	P
	- between live parts and mounting surface ..	1480V	P
	- between live parts and metal parts	1480V	P
	- between live parts of different polarity through action of a switch		N
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts	1480V	P
	- Insulation bushings as described in Section 5		N
1.14 (10.3.1)	Leakage current (mA) :	Max. 0.05mA	P

1.15 (13)	RESISTANCE TO HEAT, FIRE AND TRACKING		P
1.15 (13.2.1)	Ball-pressure test:		P
	- part tested; temperature (°C) :	Wire connector: 125°C	P
	- part tested; temperature (°C)	LED cover: 108°C	P
1.15 (13.3.1)	Glow wire test (750°C):		P
	- part tested	Wire connector flame extinguished within 8s	P
	- part tested	T1 bobbin(YHL-ID-180-HB-VE) flame extinguished within 10s	P
	- part tested	LED driver PCB(YHL-ID-180-HB-VE) flame extinguished within 10s	P

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
	- part tested.....:	T1 bobbin(YHL-ID-200-HB-VE(IR)) flame extinguished within 10s	P
	- part tested.....:	LED driver PCB(YHL-ID-200-HB-VE(IR)) flame extinguished within 10s	P
1.15 (13.3.2)	Glow wire test (650°C):		P
	- part tested.....:	LED cover	P
	- part tested.....:		N
1.15 (13.3.3)	Needle flame test (30 s):		P
	- part tested.....:		P
1.15 (13.3.4)	Needle flame test for PCB (30 s):		P
	- part tested.....:	Driver PCB (YHL-ID-180-HB-VE): The flames extinguish after remove the needle flame 3s.	P
	- part tested.....:	Driver PCB (YHL-ID-200-HB-VE(IR)): The flames extinguish after remove the needle flame 3s.	P
1.15 (13.4.1)	Tracking test: part tested		N
	- part tested.....:		N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 1: components			P
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object/part No.	code	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity
Power cord	B	Shenzhen Tongyuan Industrial Co., Ltd.	H05VV-F	300/500V 3G1.0mm ²	AS/NZS 60227.5:2003 A1	NSW 24638
Plug	B	Shenzhen Tongyuan Industrial Co., Ltd	TY-A301	250V, 10A	AS/NZS 3112:2011 Inc A1-2	GMA-102684-EA-001
LED driver (YHL-ID-180-HB-VE)	B	MEAN WELL ENTERPRISES CO LTD	HBG-240-36A	100-240VAC 50/60Hz 6.7A	IEC 61347-1(ed.2);am1;a m2, IEC 61347-2-13(ed.2)	Nemko NO89381
LED driver (YHL-ID-200-HB-VE(IR))	B	INVENTRONICS (HANGZHOU), INC.	EUR-240S670ST	100-240VAC 50/60Hz	IEC 61347-2-13:2014 IEC 61347-1:2007+A1+A 2	TUV RH DE 2-019985
Wire connector	B	Dongguan de zhi hermetic technique co., ltd	M20S-10	110°C IP 68	EN 50262/A2:2004	TUV SUD B 14 09 87842 001
LED Board	B	SHENZHEN HEJIN CIRCUITS CO LTD	HHX-1	V-0, 280°C	UL 796	UL E363709
LED	B	Nicha	NF2W757DRT-V1	IF:200mA VF:5.7-7.1V	IEC 62031 IEC 62471	Test with appliance
LED lens	B	TEIJIN LIMITED RESIN AND PLASTIC	LN-2525Z(#)(f1)	V-0, 115°C	UL 746	UL E50075

The codes above have the following meaning:

- A - The component is replaceable with another one, also certified, with equivalent characteristics
- B - The component is replaceable if authorised by the test house
- C - Integrated component tested together with the appliance
- D - Alternative component

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
	ANNEX 2: temperature measurements, thermal tests of Section 12		P
	Type reference.....:	YHL-ID-180-HB-VE	—
	Lamp used	LED	—
	Lamp control gear used	Approved independent SELV control gear	—
	Mounting position of luminaire	As user Manual	—
	Supply wattage (W)	168.8W	—
	Supply current (A)	0.709A	—
	Calculated power factor		—
	Table: measured temperatures corrected for $t_a = 50\text{ }^{\circ}\text{C}$:		P
	- abnormal operating mode.....:		—
	- test 1: rated voltage	-	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage	1.06 times rated voltage:254.4V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage.....:	-	—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage		—
	Through wiring or looping-in wiring loaded by a current of A during the test	-	—

temperature ($^{\circ}\text{C}$) of part	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1	test 2	test 3	limit	test 4	limit
Plug	-	51.9	-	Ref	-	-
Supply Cord	-	54.1	-	Ref	-	-
Wire connector	-	53	-	Ref	-	-
Input wire of driver	-	57.6	-	105	-	-
Driver enclosure	-	82.8	-	85	-	-
Input wire of LED board	-	96.8	-	105	-	-
LED board	-	99.2	-	280	-	-
Cover(PC and Glass)	-	82.2	-	115	-	-
Enclosure	-	68.8	-	90	-	-
Mounting surface	-	61.8	-	90	-	-
Ambient	-	50	-	-	-	-

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
	ANNEX 2: temperature measurements, thermal tests of Section 12		P
	Type reference.....:	YHL-ID-200-HB-VE(IR)	—
	Lamp used	LED	—
	Lamp control gear used	Approved independent SELV control gear	—
	Mounting position of luminaire	As user Manual	—
	Supply wattage (W)	206W	—
	Supply current (A).....:	0.835A	—
	Calculated power factor		—
	Table: measured temperatures corrected for $t_a = 50\text{ }^{\circ}\text{C}$:		P
	- abnormal operating mode.....:		—
	- test 1: rated voltage	-	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage	1.06 times rated voltage:254.4V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage.....:	-	—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage	-	—
	Through wiring or looping-in wiring loaded by a current of A during the test	-	—

temperature ($^{\circ}\text{C}$) of part	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1	test 2	test 3	limit	test 4	limit
Plug	-	52.1	-	Ref	-	-
Supply Cord	-	53.9	-	Ref	-	-
Wire connector	-	53.4	-	Ref	-	-
Input wire of driver	-	58.3	-	105	-	-
Driver enclosure	-	81.6	-	85	-	-
Input wire of LED board	-	97.6	-	105	-	-
LED board	-	100.3	-	280	-	-
Cover(PC and Glass)	-	80.6	-	115	-	-
Enclosure	-	65.8	-	90	-	-
Mounting surface	-	62.3	-	90	-	-
Ambient	-	50	-	-	-	-

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
	ANNEX 3: screw terminals (part of the luminaire)		P
(14)	SCREW TERMINALS		P
(14.2)	Type of terminal	Pillar terminal	—
	Rated current (A)		—
(14.3.2.1)	One or more conductors	One conductor	P
(14.3.2.2)	Special preparation	Wire ends tinned	P
(14.3.2.3)	Terminal size		P
	Cross-sectional area (mm ²)	1.5mm ²	P
(14.3.3)	Conductor space (mm)	1.5mm	P
(14.4)	Mechanical tests		N
(14.4.1)	Minimum distance		N
(14.4.2)	Cannot slip out		N
(14.4.3)	Special preparation		P
(14.4.4)	Nominal diameter of thread (metric ISO thread)		N
	External wiring		N
	No soft metal		N
(14.4.5)	Corrosion		P
(14.4.6)	Nominal diameter of thread (mm).....	2.88mm	P
	Torque (Nm).....	0.5Nm	P
(14.4.7)	Between metal surfaces		P
	Lug terminal		N
	Mantle terminal		N
	Pull test; pull (N)	40N	P
(14.4.8)	Without undue damage		P

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 4: screwless terminals (part of the luminaire)									N
(15)	SCREWLESS TERMINALS									N
(15.2)	Type of terminal									—
	Rated current (A)									—
(15.3.1)	Material									N
(15.3.2)	Clamping									N
(15.3.3)	Stop									N
(15.3.4)	Unprepared conductors									N
(15.3.5)	Pressure on insulating material									N
(15.3.6)	Clear connection method									N
(15.3.7)	Clamping independently									N
(15.3.8)	Fixed in position									N
(15.3.10)	Conductor size									N
	Type of conductor									N
(15.5.1)	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
(15.8.1)	Pull test spring-type terminals or welded connections (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 1 h									N
terminal	1	2	3	4	5	6	7	8	9	10

AS/NZS 60598.2.1										
Clause	Requirement + Test					Result - Remark				Verdict
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)										

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict

Appendix A SAFETY REQUIREMENTS FOR DOUBLE-CAPPED LED LAMPS

APPENDIX A	SAFETY REQUIREMENTS FOR DOUBLE-CAPPED LED LAMPS		N
A1	GENERAL		N
A1.1	Scope		N
	This Appendix specifies the safety and interchangeability requirements of double capped LED lamps, and the exchange operation together with the test methods and conditions required to show compliance of lamps with caps G5 and G13 intended for replacing fluorescent lamps with the same caps, or other lamp caps and lampholder types that are intended for new luminaires.		N
	This Appendix includes requirements for double capped lamps for retrofit or new luminaires. These lamps may have integral, built-in or independent control gear.		N
A1.2	Application		N
	This Appendix is to be read in conjunction with AS/NZS 60598.1, with all provisions applying unless varied herein. Where the term 'luminaire' is used in AS/NZS 60598.1, it shall be replaced with the term 'lamp'. The tests described in each appropriate section of AS/NZS 60598.1 shall be carried out in the order listed in this Appendix.		N
A1.3	Testing		N
	In general, all tests are carried out on each type of lamp or, where a range of similar lamps is involved, for each power in the range or on a representative selection from the range.		N
A1.4	Specific requirements of this Appendix		N
	A lamp(s) shall be deemed to comply with this Appendix only if it complies with all the appropriate requirements of this Appendix and passes the relevant tests specified herein.		N
A1.5	Requirements of relevant test specifications		N
	Equipment and components incorporated in a lamp that is safety dependant shall comply with the appropriate requirements of any relevant test specification, unless such requirements are varied herein.		N
A3	DEFINITION		N
A3.1	Double-capped LED lamp		N
	Tubular LED light source which may be used as a replacement for another type of lamp.		N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
A4	CLASSIFICATIONS OF LAMP(S)		N
A4.1	Class		N
	Lamps shall be classified in accordance with the provisions of Section 2 of AS/NZS 60598.1. Lamps shall be classified as class II or class III for protection against electric shock.		N
	A class III lamp shall have class II construction and comply with all of the requirements for protection against electric shock for a class II lamp at a nominal rating of 240 V a.c.		N
A4.2	Type		N
	(a) Type A: Type A LED lamps shall be constructed such that one end of the lamp has the lamp cap pins electrically bridged and the other end of the lamp has the line and neutral supply connected to the pins of that lamp cap.		N
	(b) Type B: Type B LED lamps shall be constructed such that one end of the lamp has the lamp cap pins electrically isolated from each other and the other end of the lamp has the line and neutral supply connected to the pins of that lamp cap.		N
A5	MARKING		N
A5.1	General		N
	The Test of Marking of Clause 3.4 of AS/NZS 60598.1 shall be used to determine the durability of the markings specified in A5.2 to A5.4.		N
A5.2	Marking on the lamp		N
	(a) Mark of origin (this may take the form of a trademark, or be the manufacturer's name or the name of the responsible vendor).		N
	(b) Rated supply voltage or voltage range (marked 'V' or 'volts').		N
	(c) Rated wattage (marked 'W' or 'watts').		N
	(d) Rated frequency (marked in 'Hz').		N
	(e) A value for allowable case temperature t_c and a marked point of measurement.		N
	(f) Model number.		N
	(g) IP rating if greater than IP20.		N
	(h) Markings to identify the line and neutral supply connections of the lampholder.		N
	(i) The lamp type shall be marked with the text 'Type A' or 'Type B', as per the appropriate subfigure of Figure A1, to indicate the lamp cap configuration.		N
A5.3	Warning label for the luminaire		N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
	The following warning label shall be supplied with the lamp: WARNING: NOT FOR USE WITH ANY FLUORESCENT LAMP—FOR USE ONLY WITH TYPE X LED LAMPS		N
A5.4	Marking of associated components		N
	If lamps need to be used with a component which replaces the starter, the component to replace the starter shall be marked as shown in Figure A2.		N
A6	INSTRUCTIONS		N
A6.1	Information to be supplied with the lamp		N
	(a) Special conditions or restrictions to be observed for lamp operation.		N
	(b) Wiring diagram for lamp installation		N
	(c) Information on the specification and compatibility of control gear with which the lamp can be used.		N
	(d) The ambient operating temperature range of the lamp if other than 10 to 30°C		N
	(e) The type of lamp it replaces, including lamp length, lamp cap configuration and IP rating.		N
A6.2	Information to be supplied for emergency luminaires		N
	If lamps are not suitable for use in emergency luminaires, the instructions shall include the statement		N
	Lamps suitable for use in emergency luminaires shall be marked to identify the specific luminaires that they are suitable for use in.		N
A6.3	Information about additional components		N
	If lamps need to be used with a component which replaces the starter, the instructions shall indicate the 'type reference' of the component to replace the starter.		N
A6.4	Warnings		N
	The instructions for lamps intended for use in an existing luminaire that requires modification other than replacement of the lamp or starter shall include the following warnings:		N
	The instructions for lamps intended for use in a new luminaire shall include the following warnings:		N
A6.5	Additional information		N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
	Installation instructions shall be provided. The instructions shall give adequate guidance to safely perform the retrofit or modification. Graphical instructions, describing all necessary steps for the replacement of the fluorescent lamp with a lamp, such as replacement of the starter, may be used		N
	The instruction manual shall be written in English and provided with the lamp		N
	If the lamp requires additional mechanical support then instructions for fitting shall be supplied.		N
A7	CONSTRUCTION		N
A7.1	General		N
	Lamps shall be so designed and constructed that in normal use they function reliably and cause no danger to the user or surroundings.		N
	(a) There shall be adequate provision		N
	(b) Protection against electric shock shall be maintained for all methods and positions of installation in normal use		N
	(c) Where necessary, to ensure continued safe use, metal parts shall be inherently non-corrosive, protected against corrosion or otherwise suitable for the purpose.		N
A7.2	Components that replace the starter		N
	If lamps need to be used with a component that replaces the starter, the component shall have an internal 250 V HRC 0.5 A max. quick-acting fuse.		N
A7.3	Emergency lamps		N
	Lamps suitable for use in emergency luminaires shall comply with the requirements of AS 2293.3 in that specific luminaire		N
A7.4	Compatibility of electrical supply to the lamp		N
	Lamps shall be constructed such that one end of the lamp has the lamp cap pins electrically bridged (Type A) or electrically isolated from each other (Type B) and the other end of the lamp has the line and neutral supply connected to the pins of that lamp cap		N
A8	INTERCHANGEABILITY		N
	Interchangeability shall be ensured by the use of lamp caps in accordance with IEC 60061-1 and gauges in accordance with IEC 60061-3		N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
	If lamps need to operate in combination with a component which replaces the starter, this component shall be supplied together with the lamp. This component shall comply with the dimensions and electrical, mechanical and thermal tests required by Section 1 of AS/NZS 60155.		N
A9	MASS		N
	The entire mass of a lamp shall not exceed 500 g for a G13-capped lamp or 200 g for a lamp with another type of end cap		N
	Compliance of any additional mechanical support shall be checked by the tests of Clause 4.14 of AS/NZS 60598.1		N
A10	DIMENSIONS		N
	Lamps shall have the dimensions of the corresponding lamps they are replacing in accordance with the relevant data sheets		N
A11	MECHANICAL REQUIREMENTS AND TESTS FOR CAPS		N
A11.1	Construction and assembly		N
	Caps shall be so constructed and assembled that they remain attached to the tubes during and after operation		N
A11.2	Torque test		N
	A torque test shall be applied to the lamp contact pins, as follows:		N
	A torque shall be applied such that it is increased progressively from zero to 1 N m then maintained for 30 s		N
	During the test the lamp cap shall remain firmly attached to the tube and there shall be no rotational movement between component parts of the cap exceeding an angular displacement of 6°		N
	After the test, the sample shall comply with the requirements of Paragraph A16		N
A11.3	Heat treatment test		N
	Lamp caps shall be securely fixed in position and the lamp cap fixing shall not be affected by heat		N
	Where the lamp cap fixing uses cement or chemical bonding, the lamp cap fixing shall be subject to a treatment of 2000 ±50 h at a temperature of 85 ±5°C with the lamp not energized		N
A12	CREEPAGE DISTANCES AND CLEARANCES		N
	The provisions of Section 11 of AS/NZS 60598.1 apply		N
A13	PROVISION FOR EARTHING		N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
	The provisions of Section 7 of AS/NZS 60598.1 are not applicable		N
A14	TERMINALS		N
	The provisions of Section 14 and 15 of AS/NZS 60598.1 apply to supply terminals only; they are not applicable to lamp caps		N
A15	EXTERNAL AND INTERNAL WIRING		N
	The provisions of Section 5 of AS/NZS 60598.1 apply		N
A16	PROTECTION AGAINST ELECTRIC SHOCK		N
A16.1	General		N
A16.2	Protection against electric shock		N
	The lamp shall be so constructed that, without any additional enclosure in the form of a luminaire, no internal metal parts, basic insulated external metal parts (other than caps)		N
	or live metal parts of the lamp cap or of the lamp itself are accessible when the lamp is installed in a lampholder in accordance with the relevant IEC lampholder data sheet		N
	Metal parts of class II lamps which are insulated from live parts by basic insulation only are live parts for the purpose of this Paragraph (A16).		N
	External metal parts other than the current-carrying metal parts of the cap shall not be or become live.		N
	The accessibility shall be checked with test probe B of IEC 61032, applied with a force of 10 N. Any movable conductive material shall be placed in the most onerous position without using a tool		N
A16.3	Discharge capacitors		N
	Lamps incorporating a capacitor of capacitance exceeding 0.1 μ F shall be provided with an internal discharge device, so that 1 s after disconnection the voltage between the pins of the lamp does not exceed 34 V.		N
A16.4	Electrical continuity		N
	Lamp caps do not ensure the insertion of both ends of the lamp simultaneously		N
	Compliance shall be checked by the insulation resistance test and electric strength test of Section 10 of AS/NZS 60598.1		N
	applied between the pin(s) or contacts of one cap and the pin(s) or contacts of the other cap		N
A17	ENDURANCE TEST AND THERMAL TESTS		N
A17.1	General		N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result - Remark	Verdict
	The provisions of Section 12 of AS/NZS 60598.1 apply, together with the requirements of Paragraphs A17.2 to A17.5		N
A17.2	Endurance test		N
	The duration of the endurance test of Clause 12.3 of AS/NZS 60598.1 shall be 240 h (i.e. 10 × 24 cycles at normal operation) in free air		N
A17.3	Thermal test (normal operation)		N
	During the thermal test of Clause 12.4 of AS/NZS 60598.1, no accessible surface of the lamp shall exceed 70°C for metallic surfaces or 85°C for non-metallic surfaces		N
A17.4	Thermal test compliance		N
	The surface temperature of inaccessible parts of the lamp cap shall not exceed 120°C		N
A17.5	Thermal test (abnormal operation) for class III lamps		N
	Class III lamps shall, in addition, be subject to the abnormal operation test of Clause 12.5 of AS/NZS 60598.1 for a 240 V a.c. rating. The lamp shall not become unsafe during this test		N
A18	POWER REQUIREMENT		N
	The measured power of the lamp and any associated circuitry shall not be greater than 1.1 times the rated power		-
A19	RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE		N
	Where the lamp is marked with an IP rating in accordance with Paragraph A5.2(g), the tests of Section 9 of AS/NZS 60598.1 shall be conducted on the lamp at its marked rating		N
A20	INSULATION RESISTANCE AND ELECTRIC STRENGTH		N
	The provisions of Section 10 of AS/NZS 60598.1 apply		N
A21	RESISTANCE TO HEAT, FIRE AND TRACKING		N
	The provisions of Section 13 of AS/NZS 60598.1 apply		N
A22	PHOTOBIOLOGICAL HAZARD		N
	The lamp shall not exceed the photobiological hazard ratings for Risk Group 1 (low risk), in accordance with Clause 6.1.2 of AS/NZS IEC 62471:2011		N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result – Remark	Verdict

Appendix ZZ

VARIATIONS TO IEC 60598.1, Ed. 7.0 (2008) FOR AUSTRALIA AND NEW ZEALAND (Normative)

ZZ1	SCOP		P
	This Appendix sets out variations between this Standard and IEC 60598-1, Ed. 7.0 (2009) and additional requirements to cover issues that have not been addressed by the International Standard. These variations indicate national variations for the purposes of the IECEE CB Scheme and will be published in the IECEE CB Bulletin.		P
ZZ2	Variations		P
Clause 0.1	Add the following text at the end of Clause 0.1: Where the term “lamp” is used in this Standard, it is taken to include electric light sources. LED light sources are subject to the same test parameters as “other discharge lamps”. NOTE it is recommended that portable, rechargeable, battery operated luminaires comply with AS/NZS 50335.1, Annex B. In addition, portable, rechargeable, battery operated luminaires with lithium ion batteries should have overvoltage protection.		N
0.2	Add the following normative references: AS/NZS 3112, Approval and test specification—plugs and socket-outlets AS/NZS 3133, Approval and test specification—Air-break switches AS/NZS 3191, Electric flexible cords AS/NZS 60895.11.10, Fire hazard testing—Part 11.10: Test flames—50 W horizontal and vertical flame test methods (IEC 60695-11-10:1999, IDT) AS/NZS 61535, Installation couplers intended for permanent connection in fixed installations (IEC 61535, Ed. 1.0 (2009) MOD) IEC 61046, Auxiliaries for lamps—Capacitors for use in tubular fluorescent and other discharge lamp circuits—General and safety requirements IEC 61049, Auxiliaries for lamps—Capacitors for use in tubular fluorescent and other discharge lamp circuits—Performance requirements IEC 61995-1, Devices for the connection of luminaires for household and similar purposes—Part 1: General		P

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result – Remark	Verdict
0.4.2	After the first paragraph, add the following text: In Australia, for equipment, other than class III equipment, that is intended for connection to the supply mains and not marked with: -a rated voltage of at least 240 V for single-phase equipment or a rated voltage of at least 415 V for three-phase equipment; or -a rated voltage range that includes for single-phase equipment and 415 V for three-phase equipment, The rated voltage is equal to 240 V for single-phase and 415 V for three-phase equipment, and upper limit of the voltage range is equal to 240 V for single-phase equipment and 415 V for three-phase equipment.		P
0.5	Add the following paragraph after the title: Throughout this document, where there is a relevant Australian/New Zealand Standard, it replaces the IEC Standard unless otherwise specified.		P
0.5.2A	Add the following new Clause after Clause 0.5.2: 0.5.2A Capacitors Capacitors shall comply with Clause 4.2A.		N
1.2	Add the following new definitions after 1.2.86 1.2.87 Installation coupler Connecting device consisting of an installation female connector and an installation male connector provided with retaining means for permanent connection not intended to be engaged or disengaged under load nor to be engaged or disengaged other than during first installation, during maintenance of the wiring system or during re-configuration of the wiring system		N
	1.2.88 Installation male connector Load side portion of an installation coupler which contains the male contacts		N
	1.2.89 Installation female connector Supply side portion of an installation coupler which contain the female contacts		N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result – Remark	Verdict
	1.2.90 Installation coupler system Family of installation couplers consisting of one or more installation female connectors compatible by mechanical coding features with one or more installation male connectors, with the same ratings produced according to the specification of one manufacturer		N
2.2	At the end of Clause 2.2, add the following paragraph: Class 0 luminaires are not allowed in Australia or New Zealand.	Class I	N
TABLE 3.1	Move Item 3.2.21 from the centre column to the right hand column		P
3.2.12	Add the following paragraph after Note 3: In Australia, luminaires for household use and similar with supply cords which are not fitted with a plug shall be marked with a cord tag with the symbol for “must be installed by a licensed electrician”. (Refer to Figure ZZ1).		P
3.3	Add the following test after the second paragraph: In Australia and New Zealand, instructions and other tests required by this standard shall be written in English Compliance is checked by inspection.		P
3.3.7	Delete Clause 3.3.7 and replace with the following: 3.3.7 luminaries for use with metal halide lamps shall be provided with instructions that stage the substance of the following: To avoid potential unsafe lamp failure. The luminaire shall be operated: -complete with its protective shield; or -with a double jacketed lamp.		N
3.3.10	Delete Clause 3.3.10		P
3.3.21	Added the following new Clause 3.3.21 the instructions shall contain details related to components in the luminaire that require replacement as part of a maintenance program.		N
4.8	Add the following paragraph after the third paragraph: Switched that indicate an off position shall have contacts with an air break and comply with AS/NZS3133 or AS/NZS 61068.1.		N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result – Remark	Verdict
4.2A	Add the following new Clause after Clause 4.2: 4.2A Capacitors shall be of a type to ensure that any capacitor failure results in a failsafe outcome (i.e. the capacitor type will fail in the open-circuit mode only and is protected against fire or shock hazard). Capacitors shall be not less than Type B capacitors with metal body and break action protection in accordance with IEC 61048 and IEC 61049. A capacitor complying with ANCI/EIA-456-A shall comply with IEC 61049 and IEC 61048:2006 excluding the endurance test of 18.1.1. NOTE Capacitors of Class S2 (formerly referred to as P2) of IEC 60252 (all parts) do not meet the safety requirements of a Type B capacitor. In addition, capacitors shall have a minimum voltage rating of 250 V at a temperature rating of 100°C or 280 V at a temperature rating of 85 °C. Capacitors likely to be permanently subjected to the supply voltage, and used for radio interference suppression or for voltage dividing, shall comply with IEC 60384-14.		N
5.2.1	Delete the first paragraph and replace with the following: Luminaires shall be provided with only one of the following means of connection and isolation to the supply. Fixed luminaires: -device for the connection of luminaires; -terminals; plug for engagement with socket-outlet; -connecting lead (tails); -supply cord and plug; -adaptor for engagement with supply tracks; -appliance inlet; -installation coupler; -luminaire coupler; Portable luminaires: -supply cord with plug -appliance inlet. Track-mounted luminaires: -adaptor; -connector.		P
	<i>Deleted the second and third paragraph.</i>		N

AS/NZS 60598.2.1									
Clause	Requirement + Test	Result – Remark	Verdict						
	<i>Add the following text after Note 3:</i> <i>In Australia, non-portable luminaires with a supply cord shall be fitted with a plug complying with AS/NZS 3112 or a coupler complying with its standard, except where the luminaire has markings an instructions that comply with Clause 3.2.12, in which case, a plug or coupler is not required. However, for other than portable luminaires a plug is not required if the luminaire has markings and instructions in accordance with Clause 3.2.12. The plug portion of a luminaire with integral pins shall comply with the relevant requirements of AS/NZS 3112.</i> <i>NOTE 1 Relevant requirements for equipment with integral pins are outlined in AS/NZS 3112</i> <i>NOTE 2 PVC-insulated connection cords should not be used with outdoor luminaires in cold alpine locations.</i>		N						
5.2.2	Delete the first paragraph and replace with the following: Supply cords used as a means of connection to the supply, when supplied by luminaire manufacturer, shall be at least equal in their mechanical and electrical properties to those specified in IEC 60227 and 60245, as indicated in Table 5.2 or AS/NZS 3191, and shall be capable of withstanding without deterioration, the highest temperature to which they may be exposed under normal conditions of use		P						
	Table 5.2 delete rows 4 and 5 and replace with the following: <table><tr><td>Luminaires which are other than ordinary Portable rough service luminaires</td><td>60245 IEC 57</td><td>60227 IEC 53</td></tr><tr><td>Portable rough service luminaires</td><td>60245 IEC 66</td><td>PVC insulated and sheathed heavy duty flexible cord</td></tr></table>	Luminaires which are other than ordinary Portable rough service luminaires	60245 IEC 57	60227 IEC 53	Portable rough service luminaires	60245 IEC 66	PVC insulated and sheathed heavy duty flexible cord		N
Luminaires which are other than ordinary Portable rough service luminaires	60245 IEC 57	60227 IEC 53							
Portable rough service luminaires	60245 IEC 66	PVC insulated and sheathed heavy duty flexible cord							
	Delete the third paragraph and replace with the following: To provide adequate mechanical strength, the nominal cross-sectional area of the conductors shall be not less than: -0,75 mm² -1,0 mm² for the portable rough service luminaires.		P						
5.2.16	Add the following text at the end of Clause 5.2.16: Class II luminaires for fixed wiring incorporating an appliance coupler shall not have means to allow further luminaires to be connected, including looping in by cascading. Luminaire couplers incorporated with the luminaire shall comply with IEC 61195-1		N						

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result – Remark	Verdict
5.2.18	Delete Clause 5.2.18 and replace with the following: 5.2.18 All portable luminaires with a flexible supply cord shall be fitted with a plug complying with AS/NZS 3112. Other luminaires with flexible cords shall be fitted with a plug complying with AS/NZS 3112, unless they have the warning allowed by Clause 3.2.12		N
5.2.19	Add the following new Clause: 5.2.19 Installation couplers incorporated within luminaires shall comply with the requirements of AS/NZS 61535. Luminaires incorporating installation couplers may be means to allow further luminaires to be connected by cascading provided the through wiring is rated for the current rating of the installation coupler.	No such coupler	N
5.3.1	Delete the third paragraph and replace with the following: Internal wires coloured green, yellow or green/yellow combination shall be used for marking protective earth connections only. Functional earth connections shall not be made by wires coloured green, yellow or green/ yellow combination.		N
	Add the following new Note: NOTE 3 Internal wires of other colours are not precluded from making protective earthing connections.		P
7.2.11	Delete the third paragraph and replace with the following: All conductors, whether internal or external, coloured green, yellow or green/yellow combination, shall only be connected to an earthing terminal.		P

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result – Remark	Verdict
8.2.1	Delete the first paragraph and Note 1 and replace with the following: Luminaires shall be so constructed that their live parts and basic insulation are not accessible when the luminaire has been installed and wired as in normal use. Live parts shall not be accessible when the luminaire is opened as necessary for replacing lamps, replaceable light sources or (replaceable) starters, even if the operation cannot be achieved by hand. NOTE Examples of parts with basic insulation are cables intended for internal wiring, controlgear for building-in etc. This does not apply to the non-current-carrying parts of caps which comply with the relevant IEC safety standard. Where a protective cover is used over a non-user-replaceable light source to provided protection against electric shock, and the cover is marked with the“caution, electric shock risk” symbol in accordance with IEC 60417-6042, the cover shall be left in place during the tests and inspections detailed by Section 8 of this Standard. The cover shall be held securely in position by fixings requiring the use of a tool for their removal, and at least two independent fixings shall be used.		P
TABLE 12.1	Add the following new Note after Table 12.1: NOTE Luminaire manufacturers should consider the maximum ambient air temperature in the vicinity of components such as starting devices and electronic ballasts or converters. Component performance specifications advise manufacturers to mar or supply life data as maximum ambient air temperature based on 50,000 hrs. This t-life is often marked as ta and is the temperature of the air in the vicinity of the component and is not related to the luminaire ta. As such, luminaire manufacturers should measure air temperature in the vicinity of such components, within the luminaire, as even those complying with their tc point measurements can still fail prematurely if t-life is exceeded.		N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result – Remark	Verdict
Clause 13.3	Delete Clause 13.3 and replace with the following: 13.3 Resistance to flame and ignition Parts of non-metallic material shall be resistant to flame and ignition. For materials other than ceramic, compliance is checked by the tests of 13.3.1 and 13.3.2, 13.3.3 and 13.3.4, as appropriate This requirement does not apply to decorative trims, knobs, wiring insulation and other parts not likely to be ignited or to propagate flames from inside the luminaire This Clause applies to all parts, including components, even if they have been tested to their own standard.		P
	13.3.1 parts of non-metallic material supporting connections shall withstand the following tests: Parts are subject or a test using a nickel-chromium glow-wire. The test apparatus and test procedure shall be those described in AS/NZS 60695.2.10 The glow-wire is heated to 750 °C and applied to the test sample for 30 s. For all tests, any flame or glowing of the sample shall extinguish within 30 s of withdrawing the glow-wire, and any burning or molten drop shall not ignite a single layer of tissue paper specified in 4.187 of ISO 4046-4:2002, spread out horizontally 200 mm +/- 5 mm below the sample		P
	13.2.2 All other parts of non-metallic material shall withstand the following test: Parts are subject to a test using a nickel-chromium glow-wire. The test apparatus and test procedure shall be those described in AS/NZS 60695.2.10. The glow wire is heated to 650 °C and applied to the test sample for 30 s. for all tests, and flame or glowing of the sample shall extinguish within 30 s of withdrawing the glow-wire, and any burning or molten drop shall not ignite a single layer of tissue paper specified in 4.187 of ISO 4046-4:2002, spread out horizontally 200 mm+-5 mm below the sample.		P

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result – Remark	Verdict
	13.3.3 During the application of the 750 °C glow wire test of Clause 13.3.1, if a flame is produced that persists for longer than 2 s, the luminaire is further tested as follows: The needle-flame test of AS/NZS 60695.11.5 is applied to non-metallic parts that encroach with in the envelope of a vertical cylinder having a diameter of 20 mm and a height of 50 mm above the point of application of the glow wire. The needle flame is applied to the test sample for 30 s. Parts shielded by a barrier that meets the needle-flame test of AS/NZS 60695.11.5 are not tested. NOTE This requires the needle flame to be applied to all parts likely to be impinged upon by the glow-wire flame within the hypothetical envelope of a vertical cylinder positioned above the point of application of the glow-wire. This applies to all parts unless there is a barrier that passes the needle-flame test and is within the cylinder and would protect the part from the glow-wire flame. The duration of burning shall not exceed 30 s after removal of the test flame and any burning drop shall not ignite the underlying parts or tissue paper specified in 4.187 of ISO 4046-4:2002, spread out horizontally 200 mm+/- 5 mm below the sample. The needle-flame test is not carried out on parts that are made of material classified as V-0 or V-1 according to AS/NZS 60950.11.10. The sample of material classified in accordance with AS/NZS 60695.11.10 shall be no thicker than the relevant part.		P
	13.3.4 PCBs in luminaires shall be subject of the needle-flame test of AS/NZS 60950.11.5. The needle flame shall be applied for 30 seconds to an edge of the PCB at least 10 mm from a corner. The duration of burning shall not exceed 15 s after removal of the needle flame and any burning droplets shall not ignite the tissue paper placed underneath the PCB. The needle-flame test is not carried out on PCBs made of material that is V-0 rated according to AS/NZS 60695.11.10.		P

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result – Remark	Verdict

Appendix B: (AUSTRALIA / NEW ZEALAND) NATIONAL DIFFERENCES According to AS/NZS IEC 61347.2.13:2013

4	Where the controlgear has accessible outputs, the controlgear shall be SELV output and comply with Annex I.		P
	SELV equivalent is not permitted where controlgear has accessible outputs or is classified as independent SELV.		N
8.2	Delete existing text and replace with the following:		P
	Output circuits of SELV controlgear with accessible outputs shall not exceed 25 V r.m.s. or 60 V d.c. ripple-free d.c. under load except as indicated below		P
	a) the touch current shall not exceed:		P
	- for a.c.: 0,7 mA (peak);	Max.: 0.05 mA	P
	- for d.c.: 2,0 mA		N
	b) the no-load output shall not exceed 33 $\sqrt{2}$ V peak or 60 V ripple free d.c.		P
	Accessible conductive parts separated by double or reinforced insulation from live part		P
9.1	Add the following subclause: Direct plug-in control gear		N
	Plug-in controlgear with pins for direct insertion into a socket-outlet shall comply with Appendix J of AS/NZS 3112:2011.		N
16.2	Add the following after point c):		P
	d) For controlgear with SELV output, the LED modules, or equivalent load for which the controlgear is designed, shall continue to be Connected in series incrementally to the output terminals until the controlgear ceases to operate or the output voltage is stabilized.		P
	During the tests specified under d), the maximum voltage measured on the output terminals shall not exceed the SELV limits of Clause 8.		P

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result – Remark	Verdict

Appendix C: (AUSTRALIA / NEW ZEALAND) NATIONAL DIFFERENCES According to AS/NZS 61347.1:2002

1	Scope		P
	AS/NZS Standard is substituted for IEC		P
	Add the following text: NOTE – Examples of products covered by this Standard are electronic starters, ballasts and electronic converters. Dimmers, iron core transformers (if not covered by 61347.2) are not included in this Standard.		N
2	Normative references		P
	Add the following text: References to International Standards that are struck through in this Clause are replaced by references to equivalent Australian or Australian/New Zealand Standards that are listed immediately thereafter and identified by shading. Any Australian or Australian/New Zealand Standard that is identical to the International Standard it replaces is appropriately identified.		P
	Add the following normative references: AS/NZS 60598.1, Luminaires—Part 1: General requirements and tests AS/NZS 60695-2-10, Glowing/hot wire based test methods—Glow-wire apparatus and common test procedures IEC 60707, Flammability of solid non-metallic materials when exposed to flame sources—List of test methods AS/NZS 60921, Ballasts for tubular fluorescent lamps—Performance requirements AS/NZS 4695.2.2, Fire hazard testing of electrotechnical products, Part 2.2: Test methods—Needle-flame test		P
5	General notes on tests		P
	Add the following text before at clause 5.1 : For Australia, the rated supply voltage is 230 V/400 V +10%, -6% and for testing according to this Standard, the rated test voltage shall be 240 V/415 V.		P

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result – Remark	Verdict
	Add the following new Note after clause 5.5 NOTE – IEC is considering replacing the above with the thermal test used in IEC 60598.1 (Annex D) for independent lamp control gear.		P
	Delete Clause 8 and replace with the following: 8 Terminals, cables and cords Screw terminals shall comply with Section 14 of AS/NZS 60598.1. Screwless terminals shall comply with Section 15 of AS/NZS 60598.1. Cables and cords shall comply with the relevant requirements of Section 5 of AS/NZS 60598.1.		P
9	Provisions for protective earthing		P
	Add the following new Clause: 9.1 Protective earth (ground). Symbol  417C-IEC-5019		P
18	Resistance to heat, fire and tracking		P
	Delete Clause 18.2, 18.3 and replace with the following:		P
18.2	Resistance to flame and ignition		P
	Parts of insulating material retaining current-carrying parts SELV parts in position, and external parts of insulating material providing protection against electric shock shall be resistant to flame and ignition. For materials other than ceramic, compliance is checked by the test of subclauses 18.2.1, 18.2.2 and 18.2.3 as appropriate.		P

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result – Remark	Verdict
18.2.1	Parts of insulating material retaining current-carrying parts in position shall withstand the following tests: Parts are subjected to a test using a nickel-chromium glow-wire heated to 750 °C. The test apparatus and test procedure shall be those described in AS/NZS 60695.2.10. Any flame or glowing of the sample shall extinguish within 30 s of withdrawing the glow-wire, and any burning or molten drop shall not ignite a single layer of tissue paper specified in 6.86 of ISO 4046, spread out horizontally 200 mm ± 5 mm below the sample. The requirements of this subclause do not apply in those cases where the control gear provides an effective barrier to burning drops or where the insulation material is ceramic.	Wire Connector: 750°C PCB:750°C T1 bobbin: 750°C See AS/NZS 60598.2.1 clause 1.15 No flame generate	P
18.2.2	Parts of insulating material which do not retain live parts in position, but which provide protection against electric shock, and parts of insulating material retaining SELV parts in position shall withstand the following test: Parts are subjected to a test using a nickel-chromium glow-wire heated to 650°C. The test apparatus and test procedure shall be those described in AS/NZS 60695.2.10. Any flame or glowing of the sample shall extinguish within 30 s of withdrawing the glow-wire, and any burning or molten drop shall not ignite a single layer of tissue paper specified in 6.86 of ISO 4046, spread out horizontally 200 mm ± 5 mm below the sample. The requirements of this subclause do not apply in those cases where the control gear provides an effective barrier to burning drops or where the insulation material is ceramic.		N

AS/NZS 60598.2.1			
Clause	Requirement + Test	Result – Remark	Verdict
18.2.3	During the application of the glow-wire tests of subclauses 18.2.1 and 18.2.2, the height and duration of the flames are measured. In addition, for parts that withstand the glow-wire test but which flame during the application of the glow-wire, the surrounding parts are subjected to the needle-flame test, in accordance with AS/NZS 4695.2.2, for the measured duration of the flame or 30 s, whichever is the least, if— – they are positioned within a distance equal to the height of the flame, and – they are likely to be impinged upon by the flame. However, parts shielded by a separate barrier that meets the needle-flame test are not tested. The needle-flame test is not carried out on parts that are made of material classified as FV-0 or FV-1 according to IEC 60707. The sample of material submitted to the test of IEC 60707 shall be no thicker than the relevant part. Any flame or glowing of the sample shall extinguish within 30 s of withdrawing the glow-wire, and any burning or molten drop shall not ignite a single layer of tissue paper specified in 6.86 of ISO 4046, spread out horizontally 200 mm ± 5 mm below the sample. The requirements of this subclause do not apply in those cases where the control gear provides an effective barrier to burning drops or where the insulation material is ceramic.		P

IEC 62031			
Clause	Requirement + Test	Result – Remark	Verdict

Attachment 1:

Attachment according to IEC 62031 for LED HIGHBAY

5	GENERAL TEST REQUIREMENTS		P
5.5	SELV-operated LED modules comply with Annex I of AS/ZNS 61347-2-13	Approved independent SELV control gear	---

6	CLASSIFICATION		P
	Built-in module	Yes ☐ No ☒	---
	Independent module.....	Yes ☐ No ☒	---
	Integral module	Yes ☒ No ☐	---
	For Integral module; Note to 1.2.1 in AS/NZS 60598-1 applies.		---

7	MARKING		N
7.1	Mandatory markings		N
	a) mark of origin		N
	b) model number, type reference		N
	c)- rated supply voltage (V) :		N
	- rated supply current (A) :		N
	- rated input power (W) :		N
	d) nominal power		N
	e) indication of connections, wiring diagram		N
	f) value of tc and place on the module		N
	g) eye protection		N
	h) symbol for built-in modules		N
	i) heat transfer temperature td		N
	j) power for heat-conduction Pd		N
	k) working voltage for insulation		N
7.2	Location of marking		N
7.3	Durable and legibility of marking		N
	- marking of a), b), c) and f) legible after test with water		N
	- marking of d) to j) inspection of compliance		N

8	TERMINALS		N
	Screw terminals according section 14 of AS/NZS 60598-1:		N
	Separately approved; component list		N
	Part of the luminaire		N

IEC 62031			
Clause	Requirement + Test	Result – Remark	Verdict

	Screwless terminals according section 15 of AS/NZS 60598-1:		N
	Separately approved; component list		N
	Part of the luminaire		N
	Connectors according IEC 60838-2-2:		N
	Separately approved; component list		N

9	PROVISION FOR PROTECTIVE EARTHING		N
	External metal parts connected to the earth terminal:		N
	- compliance with 7.2.1 in AS/NZS 60598-1		N
	Test with a current of 10 A between earthing terminal and each of the accessible metal parts; measured resistance (Ω): $< 0,5 \Omega$		N
	Protective earth, symbol		N
	Terminal complying with clause 8 in Part 1		N
	Locked against loosening and not possible to loosen by hand		N
	Not possible to loosen clamping means unintentionally on screwless terminals		N
	Earthing via means of fixing		N
	Earthing terminal only used for the earthing of the control gear		N
	All parts of material minimizing the danger of electrolytic corrosion		N
	Made of brass or equivalent material		N
	Contact surface bare metal		N
	Conductors by tracks on printed circuit boards:		N
	- a.c. current of 25 A for 1 min between earthing terminal and accessible metal parts		N
	- compliance with clause 7.2.1 in AS/NZS 60598-1		N

10 (10)	PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS		P
	Protection against accidental contact with live parts in compliance with AS/NZS 61347-1 (clause numbers between parentheses refer to AS/NZS 61347-1)		P
- (10.1)	Controlgear protected against accidental contact with live parts		N
- (A1)	Current measured according to IEC 60990, figure 4 and clause 7.1: max. 0,7 mA (peak) or 2,0 mA d.c., for $f \geq 1000$ Hz max. 70 mA		N
- (A2)	Voltage at 50 k Ω (V): max. 34 V (peak)		P

IEC 62031			
Clause	Requirement + Test	Result – Remark	Verdict
	Lacquer or enamel not used for protection or insulation		P
	Adequate mechanical strength on parts providing protection		P
- (10.2)	Capacitors > 0,5 μ F: voltage after 1 min (V): < 50 V :		N
11	MOISTURE RESISTANCE AND INSULATION		P
	Protection against moisture and insulation in compliance with Clause 11, AS/NZS 61347-1		P
	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance with d.c. 500 V ($M\Omega$): $\geq 2 M\Omega$:	93% 25 °C 48h	P
	Adequate insulation between input and output terminals not bounded together in SELV-equivalent control gear		N
	For double or reinforced insulation the resistance exceeds 4 $M\Omega$		N
12	ELECTRIC STRENGTH		P
	Electric strength in compliance with Clause 12 of AS/NZS 61347-1		P
	Immediately after clause 11 electric strength test for 1 min		P
	Working voltage ≤ 42 V, test voltage 500 V	500V	P
	Working voltage > 42 V, test voltage (V): $2U + 1000$ V :		N
	Reinforced insulation, test voltage (V): :		N
	No flashover or breakdown		P
	Windings in separating transformers in SELV-equivalent control gear according to 14.3.2 of EN 60065		N
13	FAULT CONDITIONS		P
13.1	In compliance with AS/NZS 61347-1 (clause numbers between parentheses refer to AS/NZS 61347-1)		P
	When operated under fault conditions the LED-module:		P
	- does not emit flames or molten material		P
	- does not produce flammable gases		P
	- protection against accidental contact not impaired		P
	Thermally protected control gear does not exceed the marked temperature value		N

IEC 62031			
Clause	Requirement + Test	Result – Remark	Verdict
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected		N
- (14.1)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (except between live parts and accessible metal parts)		N
	Distances on printed boards provided with coating according to IEC 60664-3		N
- (14.2)	Short-circuit or interruption of semiconductor devices		N
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile		N
- (14.4)	Short-circuit across electrolytic capacitors		N
- (14.5)	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		N
	After the tests the insulation resistance with d.c. 500 V (MΩ) are $\geq 1 \text{ M}\Omega$		N
	Temperature declared thermally protected LED-modules fulfil the requirements in Annex C of IEC 61437-1		N
13.2	Module withstands overpower condition >15 min.		P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		N
	During the tests, tissue paper, spread below module, does not ignite		P
15	CONSTRUCTION		P
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
16	CREEPAGE DISTANCES AND CLEARANCES		P
	Creepage and distances and clearances in compliance with AS/NZS60598-1		P
	Class of protection	Class III LED module	—
	Working voltage (V)	37V	—
	Voltage form	Sinusoidal ☐ Non-sinusoidal ☒	—
	PTI	< 600 ☒ > 600 ☐	—
	Rated pulse voltage (kV)	-	—

IEC 62031			
Clause	Requirement + Test	Result – Remark	Verdict
	(1) Live parts of different polarity: cr (mm); cl (mm):	Cl=6.34mm (Required:0.2 mm) Cr=6.34mm (Required:1.2mm)	P
	(2) Live parts and accessible parts: cr (mm); cl (mm):	Cl >4.0mm (Required:0.2mm) Cr>4.0mm(Required:1.2mm)	P
	(3) Parts becoming live: cr (mm); cl (mm):		N
	(4) Outer surface of cable: cr (mm); cl (mm) :		N
	(5) Live parts of switches: cr (mm); cl (mm) :		N
	(6) Live parts and supporting surface: cr (mm); cl (mm):		N

17 (17)	SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS		P
	Screws, current-carrying parts and connections in compliance with AS/NZS 60598-1 (clause numbers between parentheses refer to AS/NZS 60598-1)		P
(4.11)	Electrical connections:		P
(4.11.1)	Contact pressure		P
(4.11.2)	Screws:		P
	- self-tapping screws		P
	- thread-cutting screws		N
	- at least two self-tapping screws		N
(4.11.3)	Screw locking:		N
	- spring washer		N
	- rivets		N
(4.11.4)	Material of current-carrying parts		P
(4.11.5)	No contact to wood		P
(4.12)	Mechanical connections and glands:		P
(4.12.1)	Mechanical stress		P
	Screws not made of soft metal		P
	Screws of insulating material		N
	Torque test: part; torque (Nm) :	Screw for LED module :2.98mm 0.5Nm	P
	Torque test: part; torque (Nm) :		N
	Torque test: part; torque (Nm) :		N
(4.12.2)	Screw diameter < 3 mm screwed into metal		P
(4.12.3)	Void		—
(4.12.4)	Locked connections		N

IEC 62031			
Clause	Requirement + Test	Result – Remark	Verdict
(4.12.5)	Screwed glands: force (N)		N
18 (18)	RESISTANCE TO HEAT, FIRE AND TRACKING		P
	Resistance to Heat, Fire and Tracking in compliance with AS/NZS 61347-1 (clause numbers between parentheses refer to AS/NZS 61347-1)		N
(18.1)	Parts of insulating material retaining live parts in position, ball-pressure test:		N
	- part; test temperature (°C)		N
	- part; test temperature (°C)		N
(18.2)	Printed boards in accordance with IEC 60249-1, 4.3		N
(18.2.1)	Parts of insulating material retaining current-carrying parts in position conduct glow-wire test 750 °C		N
(18.2.2)	Parts provide protection against electric shock, and parts of insulating material retaining SELV parts in position conduct glow-wire test 650 °C		N
(18.2.3)	needle-flame test :		N
	- flame extinguished within 30 s		N
	- no flaming drops igniting tissue paper		N
(18.3)	Tracking test		N
19	RESISTANCE TO CORROSION		N
	Resistance to corrosion in compliance with AS/NZS 61347-1		N
	Rust protection:		N
	- test according 4.18.1 of AS/NZS 60598-1		N
	- adequate varnish on the outer surface		N
14	TABLE: tests of fault conditions		P
Part	Simulated fault		Hazard
LED	S-C, No Hazard;		NO
LED	O-C, No Hazard		NO
A	ANNEX A - TESTS		P
	All tests performed in accordance with the advice given in Annex H of IEC 61347-1, if applicable		P
	ANNEX 1: SELV-operated LED modules		P
	ANNEX I of AS/NZS 61347-2-13: Approved independent SELV control gear		P
I.3	Classification		N
I.3.1	Class I	Yes ☐ No ☐	—

IEC 62031			
Clause	Requirement + Test	Result – Remark	Verdict
	Class II	Yes ☐ No ☐	—
I.3.2	a) non-inherently short circuit proof controlgear	Yes ☐ No ☐	—
	b) non-inherently open circuit proof controlgear	Yes ☐ No ☐	—
	c) inherently short circuit proof controlgear	Yes ☐ No ☐	—
	d) inherently open circuit proof controlgear	Yes ☐ No ☐	—
	e) fail safe controlgear	Yes ☐ No ☐	—
	f) non-short-circuit proof controlgear	Yes ☐ No ☐	—
	g) non-open-circuit proof controlgear	Yes ☐ No ☐	—
I.4	Marking		N
	Adequate symbols are used		N
I.5	Protection against electric shock		N
I.5.1	No connection between output winding and body		N
	No connection between output winding and protective earthing circuit		N
I.5.2	Input and output circuits electrically separated from each other		N
I.5.2.1	Insulation between input and output winding of the HF-transformer consists of double or reinforced insulation		N
	Class II: insulation between input/output and body consists of double or reinforced insulation		N
	Class I: insulation between input and body consists of basic and between output and body supplementary insulation		N
I.5.2.2	Insulation between input and output winding via the core consists of double or reinforced insulation		N
	Insulation between cord and windings of the HD-transformer consists of basic insulation		N
I.5.2.3	Serrated tape, additional layer		N
I.5.2.4	Class I controlgear for fixed connection provided with basic insulation plus protective screening comply with the following conditions:		N
	a) Insulation between the input winding and the protective screen complies with the requirements for basic insulation		N
	b) Insulation between the protective screen and the output winding complies with the requirements for basic insulation		N
	c) Metal screen consists of a metal foil or of a wire wound screen		N
	d) Metal screen so arranged that both edges cannot simultaneously touch a magnetic core		N

IEC 62031			
Clause	Requirement + Test	Result – Remark	Verdict
	e) Metal screen and its lead-out wire have a cross-section sufficient to ensure that an overload device will open the circuit before the screen is destroyed		N
	f) Lead-out wire sufficiently fixed to the metal screen		N
I.6	Heating		N
I.6.1	No excessive temperatures in normal use		N
	Used material classified as Class :		—
	Stated value of t_a :		—
I.6.2	Temperature rises (Upri: 1.06 time supply rated voltage)		N
	Determined temperature rises in windings: - Primary (K) : - Limit max (K) : - Secondary (K) : - Limit max (K) :		N
	After the test:		N
	- no connections have worked loose		N
	- no reduction of creepage distances and clearances		N
	- no flow of sealing compound		N
	- no operation of protecting devices		N
	- electric strength test between input and output windings		N
I.6.3	Cycling test (10 cycles):		N
I.6.3.1	- heat run at (K) :		N
I.6.3.2	- moisture treatment 48 h		N
I.6.3.3	- vibration test 1 h; 1,5 g		N
I.6.3.4	After the tests:		N
	- insulation resistance $\geq 2, 4$ or $5 \text{ M}\Omega$		N
	- dielectric strength test for 2 min. at 35 % of specified value in table I.6		N
	- Current or the ohmic component does not deviates by more than 30 %		N
I.7	Short-circuit and overload protection		N
I.7.1	Upri: 1.06 times rated voltage or 0.94 and 1.06 times rated supply voltage (V) :		N
I.7.2 I.7.3 I.7.4	Determined temperature rise in windings and on other parts:		N
	- test according to Clause :		N

IEC 62031			
Clause	Requirement + Test	Result – Remark	Verdict
	- Primary winding (K) :		N
	- Limit max (K) :		N
	- Secondary winding (K) :		N
	- Limit max (K) :		N
	- External enclosure < 80 (K) :		N
	- Rubber insulation of wiring < 60 (K) :		N
	- PVC insulation of wiring < 60 (K) :		N
	- Supports < 80 (K) :		N
I.7.5	Fail-safe convertors		N
I.7.5.1	- Upri: 1.06 times rated supply voltage V:		—
	- Isec: 1.5 times rated output current A:		—
	- time until steady-state conditions t1 (h) :		—
	- time until failure t2 (h): < t1; < 5 h :		N
I.7.5.2	During the test:		N
	- no flames, molten material, etc.		N
	- temperature rise of enclosure < 150 K		N
	- temperature rise of plywood support < 100 K		N
	After the test:		N
	- electric strength (test voltage; 35 % of specified value); no flashover or breakdown for primary-to-secondary and for primary-to-body		N
	- live parts not accessible by test finger through holes of enclosure		N
I.8	Insulation resistance and electric strength		N
I.8.1	Conditioned 48 h between 91 % and 95 %		N
I.8.2	Adequate insulation (500 V d.c. for 1 min) between:		N
	Live parts and the body -for basic insulation not less than 2 MΩ :		N
	Live parts and the body -for reinforced insulation not less than 4 MΩ :		N
	Input- and output circuits not less than 5 MΩ :		N
	Metal parts of class II convertors which are separated from live parts by basic insulation only and the body not less than 5 MΩ :		N
	Metal foil in contact with the inner and outer surfaces of enclosures of insulating material not less than 2 MΩ :		N
I.8.3	Electric strength test:		N
	1) Between live parts of input circuits and live parts of output circuits :		N

IEC 62031			
Clause	Requirement + Test	Result – Remark	Verdict
	2) Over basic or supplementary insulation between:		N
	a) live parts which are or may become of different polarity :		N
	b) live parts and body if intended to be connected to protective earth :		N
	c) accessible metal parts and a metal rod of the same diameter as the flexible cable or cord :		N
	d) live parts and an intermediate metal part :		N
	e) intermediate metal parts and the body :		N
	3) Over reinforced insulation between the body and live parts :		N
	No flashover or breakdown occurred		N
I.9	Construction		N
I.9.1	Comply with all requirements		N
I.9.2	The distance between input and output terminals shall not be less than 25 mm :		N
I.10	Components		N
I.10.1	Socket-outlets in the output circuit does not accept plugs complying with IEC 60083 and IEC 60906-1		N
I.10.2	Self-resetting protective devices shall not be used unless it is certain that there will be no hazards		N
	Compliance is checked by connecting the convertor for 48 h at 1.06 times the rated voltage with the output short-circuited		N
I.11	Creepage distances and clearances		N
	1. Insulation between input and output circuits:		N
	a) measured values > specified values (mm) :		N
	b) measured values > specified values (mm) :		N
	c) measured values > specified values (mm) :		N
	2. Insulation between adjacent input circuits: measured values > specified values (mm) :		N
	2. Insulation between adjacent output circuits: measured values > specified values (mm) :		N
	3. Insulation between terminals for external connection:		N
	a) measured values > specified values (mm) :		N
	b) measured values > specified values (mm) :		N
	c) measured values > specified values (mm) :		N
	4. Basic or supplementary insulation:		N
	a) measured values > specified values (mm) :		N
	b) measured values > specified values (mm) :		N
	c) measured values > specified values (mm) :		N

IEC 62031			
Clause	Requirement + Test	Result – Remark	Verdict
	5. Reinforced insulation: measured values > specified values (mm) :		N
	6. Distance through insulation:		N
	a) measured values > specified values (mm) :		N
	b) measured values > specified values (mm) :		N
	c) measured values > specified values (mm) :		N
	d) measured values > specified values (mm) :		N

FINAL

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict

Attachment 2: Attachment according to IEC 62471 for LED HIGHBAY

4	EXPOSURE LIMITS		P
4.1	General		P
	The exposure limits in this standard is not less than 0,01 ms and not more than any 8-hour period and should be used as guides in the control of exposure		P
	Detailed spectral data of a light source are generally required only if the luminance of the source exceeds $10^4 \text{ cd}\cdot\text{m}^{-2}$	$>10^4 \text{ cd}\cdot\text{m}^{-2}$	P
4.3	Hazard exposure limits		P
4.3.1	Actinic UV hazard exposure limit for the skin and eye		P
	The exposure limit for effective radiant exposure is $30 \text{ J}\cdot\text{m}^{-2}$ within any 8-hour period		P
	To protect against injury of the eye or skin from ultraviolet radiation exposure produced by a broadband source, the effective integrated spectral irradiance, E_s , of the light source shall not exceed the levels defined by:	For YHL-ID-180-HB-VE: $E_s=1.1\times 10^{-5} \text{ W}\cdot\text{m}^{-2}$ For YHL-ID-200-HB-VE(IR): $E_s=1.6\times 10^{-5} \text{ W}\cdot\text{m}^{-2}$	P
	$E_s \cdot t = \sum_{200}^{400} \sum_t E_\lambda(\lambda, t) \cdot s_{uv}(\lambda) \cdot \Delta\lambda \cdot \Delta t \leq 30 \text{ J}\cdot\text{m}^{-2}$		P
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye or skin shall be computed by: $t_{\max}=30/E_s$		P
		For YHL-ID-180-HB-VE: $t_{\max}=30/(1.1\times 10^{-5})=2.73\times 10^6 \text{ s}$ For YHL-ID-200-HB-VE(IR): $t_{\max}=30/(1.6\times 10^{-5})=1.875\times 10^6 \text{ s}$	P
4.3.2	Near-UV hazard exposure limit for eye		P
	For the spectral region 315 nm to 400 nm (UV-A) the total radiant exposure to the eye shall not exceed $10000 \text{ J}\cdot\text{m}^{-2}$ for exposure times less than 1000s. For exposure times greater than 1000 s (approximately 16 minutes) the UV-A irradiance for the unprotected eye, E_{UVA} , shall not exceed $10 \text{ W}\cdot\text{m}^{-2}$	For YHL-ID-180-HB-VE: $E_{\text{UVA}}=2.9\times 10^{-4} \text{ W}\cdot\text{m}^{-2}$ For YHL-ID-200-HB-VE(IR): $E_{\text{UVA}}=4.7\times 10^{-5} \text{ W}\cdot\text{m}^{-2}$	P
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye for time less than 1000 s, shall be computed by: $t_{\max}\leq 10000/E_{\text{UVA}} \text{ s}$		N
			N
4.3.3	Retinal blue light hazard exposure limit		P

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict
	To protect against retinal photochemical injury from chronic blue-light exposure, the integrated spectral radiance of the light source weighted against the blue-light hazard function, $B(\lambda)$, i.e., the blue-light weighted radiance, L_B , shall not exceed the levels defined by:		P
	$L_B \cdot t = \sum_{300}^{700} L_{\lambda}(\lambda, t) \cdot B(\lambda) \cdot \Delta\lambda \leq 10^6 \text{ J} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$		N
	$L_B = \sum_{300}^{700} L_{\lambda} \cdot B(\lambda) \cdot \Delta\lambda \leq 100 \text{ W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	For YHL-ID-180-HB-VE: $L_B = 6.7 \times 10^{-1} \text{ W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$ For YHL-ID-200-HB-VE(IR): $L_B = 3.71 \times 10^{-1} \text{ W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	P
4.3.4	Retinal blue light hazard exposure limit - small source	For YHL-ID-180-HB-VE: $\alpha = 0.1000 \text{ rad}$ For YHL-ID-200-HB-VE(IR): $\alpha = 0.1000 \text{ rad}$	N
	Thus the spectral irradiance at the eye E_{λ} , weighted against the blue-light hazard function $B(\lambda)$ shall not exceed the levels defined by: see table 4.2		N
	$E_B \cdot t = \sum_{300}^{700} E_{\lambda}(\lambda, t) \cdot B(\lambda) \cdot \Delta\lambda \leq 100 \text{ J} \cdot \text{m}^{-2}$		N
	$E_B = \sum_{300}^{700} E_{\lambda} \cdot B(\lambda) \cdot \Delta\lambda \leq 1 \text{ W} \cdot \text{m}^{-2}$		N
4.3.5	Retinal thermal hazard exposure limit		P
	To protect against retinal thermal injury, the integrated spectral radiance of the light source, L_{λ} , weighted by the burn hazard weighting function $R(\lambda)$ (from Figure 4.2 and Table 4.2), i.e., the burn hazard weighted radiance, shall not exceed the levels defined by:		P
	$L_R = \sum_{380}^{1400} L_{\lambda} \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{50000}{\alpha \cdot t^{0.25}} \text{ W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	For YHL-ID-180-HB-VE: $L_R = 4.8 \times 10^3 \text{ W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$ For YHL-ID-200-HB-VE(IR): $L_R = 2.6 \times 10^3 \text{ W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	P
4.3.6	Retinal thermal hazard exposure limit – weak visual stimulus		P
	For an infrared heat lamp or any near-infrared source where a weak visual stimulus is inadequate to activate the aversion response, the near infrared (780 nm to 1400 nm) radiance, L_{IR} , as viewed by the eye for exposure times greater than 10 s shall be limited to:		P

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict
	$L_{IR} = \sum_{780}^{1400} L_{\lambda} \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{6000}{\alpha} \quad W \cdot m^{-2} \cdot sr$	$t > 10s,$ For YHL-ID-180-HB-VE: $L_{IR} = 2.3 \, W \cdot m^{-2} \cdot sr^{-1}$ For YHL-ID-200-HB-VE(IR): $L_{IR} = 7.8 \times 10^{-1} \, W \cdot m^{-2} \cdot sr^{-1}$	P
4.3.7	Infrared radiation hazard exposure limits for the eye		P
	The avoid thermal injury of the cornea and possible delayed effects upon the lens of the eye (cataractogenesis), ocular exposure to infrared radiation, EIR, over the wavelength range 780 nm to 3000 nm, for times less than 1000 s, shall not exceed:		N
	$E_{IR} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta\lambda \leq 18000 \cdot t^{-0.75} \quad W \cdot m^{-2}$		N
	For times greater than 1000 s the limit becomes:		P
	$E_{IR} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta\lambda \leq 100 \quad W \cdot m^{-2}$	For YHL-ID-180-HB-VE: $0 \, W \cdot m^{-2}$ For YHL-ID-200-HB-VE(IR): $0 \, W \cdot m^{-2}$	P
4.3.8	Thermal hazard exposure limit for the skin		P
	Visible and infrared radiant exposure (380 nm to 3000 nm) of the skin shall be limited to:		P
	$E_H \cdot t = \sum_{380}^{3000} \sum_t E_{\lambda}(\lambda, t) \cdot \Delta t \cdot \Delta\lambda \leq 20000 \cdot t^{0.25} \quad J \cdot m^{-2}$	For YHL-ID-180-HB-VE: $E_H \cdot t = 0 \, W \cdot m^{-2} \times 10s = 0 \, J \cdot m^{-2}$ For YHL-ID-200-HB-VE(IR): $E_H \cdot t = 0 \, W \cdot m^{-2} \times 10s = 0 \, J \cdot m^{-2}$	P
5	MEASUREMENT OF LAMPS AND LAMP SYSTEMS		P
5.1	Measurement conditions		P
	Measurement conditions shall be reported as part of the evaluation against the exposure limits and the assignment of risk classification.		P
5.1.1	Lamp ageing (seasoning)		N
	Seasoning of lamps shall be done as stated in the Appropriate EN lamp standard.		N
5.1.2	Test environment	25.3°C	P
	For specific test conditions, see the appropriate EN lamp standard or in absence of such standards, the appropriate national standards or manufacturer's recommendations.		P

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict
5.1.3	Extraneous radiation		P
	Careful checks should be made to ensure that extraneous sources of radiation and reflections do not add significantly to the measurement results.		P
5.1.4	Lamp operation		P
	Operation of the test lamp shall be provided in accordance with:		P
	– the appropriate EN lamp standard, or		N
	– the manufacturer' s recommendation		P
5.1.5	Lamp system operation		N
	The power source for operation of the test lamp shall be provided in accordance with:		N
	– the appropriate EN standard, or		N
	– the manufacturer' s recommendation		N
5.2	Measurement procedure		P
5.2.1	Irradiance measurements		P
	Minimum aperture diameter 7mm.		P
	Maximum aperture diameter 50 mm.		P
	The measurement shall be made in that position of the beam giving the maximum reading.		P
	The measurement instrument is adequate calibrated.		P
5.2.2	Radiance measurements		P
5.2.2.1	Standard method		P
	The measurements made with an optical system.		P
	The instrument shall be calibrated to read in absolute radiant power per unit receiving area and per unit solid angle to acceptance averaged over the field of view of the instrument.		P
5.2.2.2	Alternative method		N
	Alternatively to an imaging radiance set-up, an irradiance measurement set-up with a circular field stop placed at the source can be used to perform radiance measurements.		N
5.2.3	Measurement of source size		P
	The determination of α , the angle subtended by a source, requires the determination of the 50% emission points of the source.		P
5.2.4	Pulse width measurement for pulsed sources		N

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict
	The determination of Δt , the nominal pulse duration of a source, requires the determination of the time during which the emission is > 50% of its peak value.		N
5.3	Analysis methods		P
5.3.1	Weighting curve interpolations		N
	To standardize interpolated values, use linear interpolation on the log of given values to obtain intermediate points at the wavelength intervals desired.		N
5.3.2	Calculations		P
	The calculation of source hazard values shall be performed by weighting the spectral scan by the appropriate function and calculating the total weighted energy.		P
5.3.3	Measurement uncertainty		P
	The quality of all measurement results must be quantified by an analysis of the uncertainty.		P
6	LAMP CLASSIFICATION		P
	For the purposes of this standard it was decided that the values shall be reported as follows:		P
	– for lamps intended for general lighting service, the hazard values shall be reported as either irradiance or radiance values at a distance which produces an illuminance of 500 lux, but not at a distance less than 200 mm	For YHL-ID-180-HB-VE: 500 lux at 3192.0mm For YHL-ID-200-HB-VE(IR): 500 lux at 3256.0mm	P
	– for all other light sources, including pulsed lamp sources, the hazard values shall be reported at a distance of 200 mm		N
6.1	Continuous wave lamps		P
6.1.1	Exempt Group		P
	In the except group are lamps, which does not pose any photobiological hazard. The requirement is met by any lamp that does not pose:		P
	– an actinic ultraviolet hazard (ES) within 8-hours exposure (30000 s), nor		P
	– a near-UV hazard (EUVA) within 1000 s, (about 16 min), nor		P
	– a retinal blue-light hazard (LB) within 10000 s (about 2,8 h), nor		P
	– a retinal thermal hazard (LR) within 10 s, nor		P
	– an infrared radiation hazard for the eye (EIR) within 1000 s		P
6.1.2	Risk Group 1 (Low-Risk)		N
	In this group are lamps, which exceeds the limits for the except group but that does not pose:		N

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict
	– an actinic ultraviolet hazard (ES) within 10000 s, nor		N
	– a near ultraviolet hazard (EUVA) within 300 s, nor		N
	– a retinal blue-light hazard (LB) within 100 s, nor		N
	– a retinal thermal hazard (LR) within 10 s, nor		N
	– an infrared radiation hazard for the eye (EIR) within 100 s		N
	Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard (LIR), within 100 s are in Risk Group 1.		N
6.1.3	Risk Group 2 (Moderate-Risk)		N
	This requirement is met by any lamp that exceeds the limits for Risk Group 1, but that does not pose:		N
	– an actinic ultraviolet hazard (ES) within 1000 s exposure, nor		N
	– a near ultraviolet hazard (EUVA) within 100 s, nor		N
	– a retinal blue-light hazard (LB) within 0,25 s (aversion response), nor		N
	– a retinal thermal hazard (LR) within 0,25 s (aversion response), nor		N
	– an infrared radiation hazard for the eye (EIR) within 10 s		N
	Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard (LIR), within 10 s are in Risk Group 2.		N
6.1.4	Risk Group 3 (High-Risk)		N
	Lamps which exceed the limits for Risk Group 2 are in Group 3.		N
6.2	Pulsed lamps		N
	Pulse lamp criteria shall apply to a single pulse and to any group of pulses within 0,25 s.		N
	A pulsed lamp shall be evaluated at the highest nominal energy loading as specified by the manufacturer.		N
	The risk group determination of the lamp being tested shall be made as follows:		N
	– a lamp that exceeds the exposure limit shall be classified as belonging to Risk Group 3 (High- Risk)		N
	– for single pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance does is below the EL shall be classified as belonging to the Exempt Group		N

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict
	– for repetitively pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance dose is below the EL, shall be evaluated using the continuous wave risk criteria discussed in clause 6.1, using time averaged values of the pulsed emission		N

FINAL

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict

Table 4.1 Spectral weighting function for assessing ultraviolet hazards for skin and eye			-
Wavelength ¹ λ , nm	UV hazard function $S_{uv}(\lambda)$	Wavelength λ , nm	UV hazard function $S_{uv}(\lambda)$
200	0,030	313*	0,006
205	0,051	315	0,003
210	0,075	316	0,0024
215	0,095	317	0,0020
220	0,120	318	0,0016
225	0,150	319	0,0012
230	0,190	320	0,0010
235	0,240	322	0,00067
240	0,300	323	0,00054
245	0,360	325	0,00050
250	0,430	328	0,00044
254*	0,500	330	0,00041
255	0,520	333*	0,00037
260	0,650	335	0,00034
265	0,810	340	0,00028
270	1,000	345	0,00024
275	0,960	350	0,00020
280*	0,880	355	0,00016
285	0,770	360	0,00013
290	0,640	365*	0,00011
295	0,540	370	0,000093
297*	0,460	375	0,000077
300	0,300	380	0,000064
303*	0,120	385	0,000053
305	0,060	390	0,000044
308	0,026	395	0,000036
310	0,015	400	0,000030
¹ Wavelengths chosen are representative: other values should be obtained by logarithmic interpolation at intermediate wavelengths. * Emission lines of a mercury discharge spectrum.			

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Clause	Requirement + Test	Result – Remark	Verdict

Table 4.2	Spectral weighting functions for assessing retinal hazards from broadband optical sources		-
	Wavelength nm	Blue-light hazard function B()	Burn hazard function R()
	300	0,01	-
	305	0,01	-
	310	0,01	-
	315	0,01	-
	320	0,01	-
	325	0,01	-
	330	0,01	-
	335	0,01	-
	340	0,01	-
	345	0,01	-
	350	0,01	-
	355	0,01	-
	360	0,01	-
	365	0,01	-
	370	0,01	-
	375	0,01	-
	380	0,01	0,1
	385	0,013	0,13
	390	0,025	0,25
	395	0,05	0,5
	400	0,10	1,0
	405	0,20	2,0
	410	0,40	4,0
	415	0,80	8,0
	420	0,90	9,0
	425	0,95	9,5
	430	0,98	9,8
	435	1,00	10,0
	440	1,00	10,0
	445	0,97	9,7
	450	0,94	9,4
	455	0,90	9,0
	460	0,80	8,0
	465	0,70	7,0
	470	0,62	6,2
	475	0,55	5,5
	480	0,45	4,5
	485	0,40	4,0
	490	0,22	2,2
	495	0,16	1,6
	500-600	$10^{[(450-\lambda)/50]}$	1,0
	600-700	0,001	1,0
	700-1050	0,013	$10^{[(700-\lambda)/500]}$
	1050-1150	0,025	0,2
	1150-1200	0,05	$0,2 \cdot 100,02^{(1150-\lambda)}$
	1200-1400	0,10	0,02
* 1 Wavelengths chosen are representative: other values should be obtained by logarithmic interpolation at intermediate wavelengths.			
* Emission lines of a mercury discharge spectrum.			

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict

Table 5.4	Summary of the ELs for the surface of the skin or cornea (irradiance based values)				-
Hazard Name	Relevant equation	Wavelength Range nm	Exposure aperture rad(deg)	Limiting aperture rad(deg)	EL in terms of constant irradiance $W.m^{-2}$
Actinic UV skin & eye	$E_S = \sum E_\lambda \cdot S(\lambda) \cdot \Delta\lambda$	200 – 400	< 30000	1,4 (80)	30/t
Eye UV-A	$E_{UV-A} = \sum E_\lambda \cdot \Delta\lambda$	315 – 400	≤ 1000 > 1000	1,4 (80)	10000/t 10
Blue-light small source	$E_B = \sum E_\lambda \cdot B(\lambda) \cdot \Delta\lambda$	300 – 700	≤ 100 > 100	< 0,011	100/t 1,0
Eye IR	$E_{IR} = \sum E_\lambda \cdot \Delta\lambda$	780 – 3000	≤ 1000 > 1000	1,4 (80)	18000/t ^{0,75} 100
Skin thermal	$E_H = \sum E_\lambda \cdot \Delta\lambda$	380 – 3000	< 10	2π sr	20000/t ^{0,75}

Table 5.5	Summary of the ELs for the retina (radiance based values)				-
Hazard Name	Relevant equation	Wavelength Range nm	Exposure duration Sec	Field of view radians	EL in terms of constant radiance $W.m^{-2}.sr^{-1}$
Blue light	$L_B = \sum L_\lambda \cdot B(\lambda) \cdot \Delta\lambda$	300 – 700	0,25 – 10 10-100 100-10000 ≥ 10000	$0,011 \cdot \sqrt{(t/10)}$ 0,011 $0,0011 \cdot \sqrt{t}$ 0,1	$10^6/t$ $10^6/t$ $10^6/t$ 100
Retinal thermal	$L_R = \sum L_\lambda \cdot R(\lambda) \cdot \Delta\lambda$	380 – 1400	< 0,25 0,25 – 10	0,0017 $0,011 \cdot \sqrt{(t/10)}$	$50000/(\alpha \cdot t^{0,25})$ $50000/(\alpha \cdot t^{0,25})$
Retinal thermal (weak visual stimulus)	$L_{IR} = \sum L_\lambda \cdot R(\lambda) \cdot \Delta\lambda$	780 – 1400	> 10	0,011	6000/α

For YHL-ID-180-HB-VE:

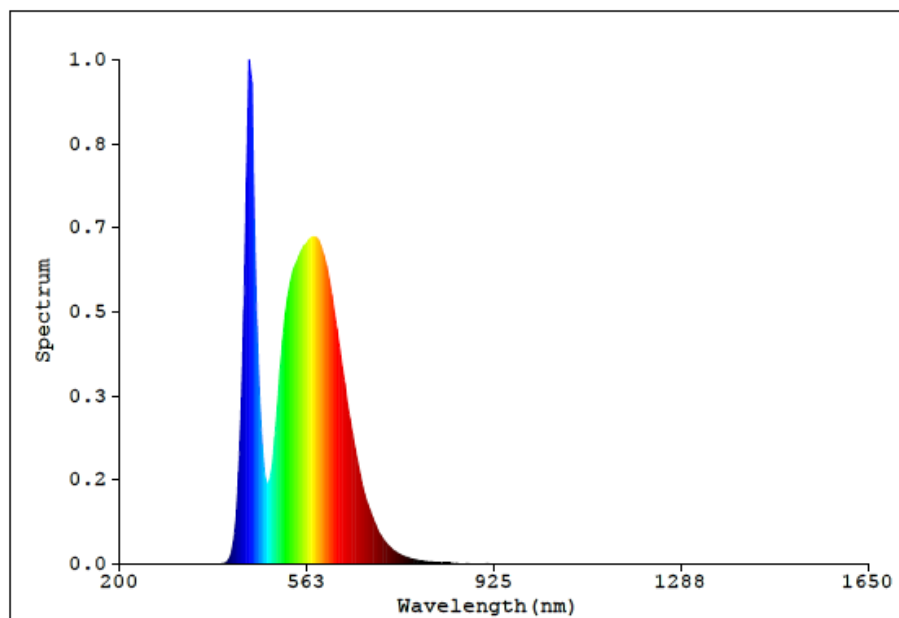
Table 6.1									P
Risk	Action spectrum	Units	Symbol	Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$W.m^{-2}$	E_S	0.001	1.1×10^{-5}	0.003	-	0.03	-
Near UV		$W.m^{-2}$	E_{UVA}	10	2.9×10^{-4}	33	-	100	-
Blue light	$B(\lambda)$	$\frac{W.m^{-2}}{sr}$	L_B	100	6.7×10^{-1}	10000	-	4000000	-
Blue light, small source	$B(\lambda)$	$W.m^{-2}$	E_B	1.0*	-	1.0	-	400	-
Retinal thermal	$R(\lambda)$	$\frac{W.m^{-2}}{sr}$	L_R	$28000/\alpha$	4.8×10^3	$28000/\alpha$	-	$71000/\alpha$	-
Retinal thermal, Weak visual stimulus**	$R(\lambda)$	$\frac{W.m^{-2}}{sr}$	L_{IR}	$6000/\alpha$	2.3	$6000/\alpha$	-	$6000/\alpha$	-
IR radiation Eye		$W.m^{-2}$	E_{IR}	100	0	570	-	3200	-
* Small source defined as one with $\alpha < 0,011$ radian. Averaging field of view at 10000 s is 0,1 radian. ** Involves evaluation of non-GLS source									

For YHL-ID-200-HB-VE(IR):

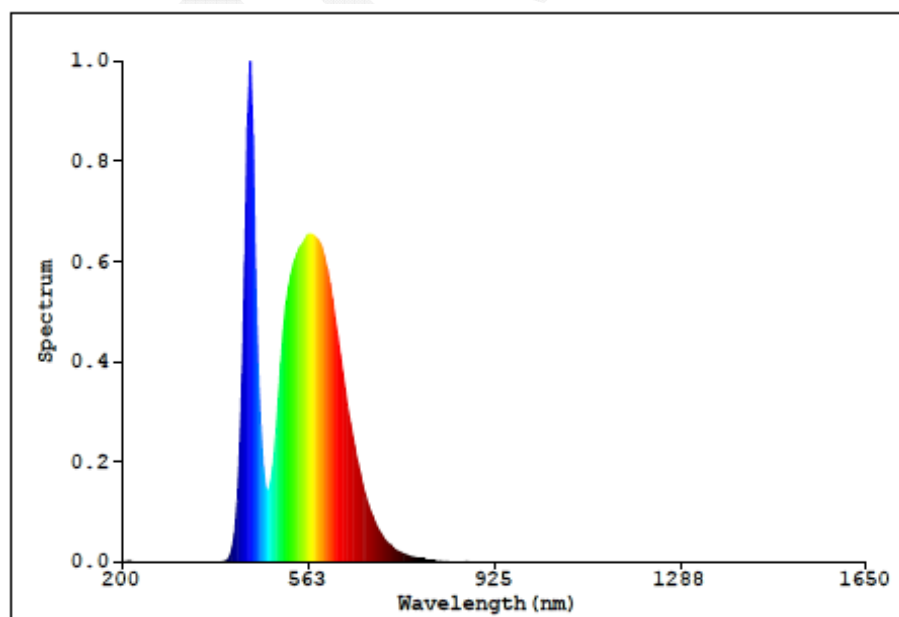
Table 6.1									P
Risk	Action spectrum	Units	Symbol	Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$W.m^{-2}$	E_S	0.001	1.6×10^{-5}	0.003	-	0.03	-
Near UV		$W.m^{-2}$	E_{UVA}	10	4.7×10^{-5}	33	-	100	-
Blue light	$B(\lambda)$	$\frac{W.m^{-2}}{sr}$	L_B	100	3.71×10^{-1}	10000	-	4000000	-
Blue light, small source	$B(\lambda)$	$W.m^{-2}$	E_B	1.0*	-	1.0	-	400	-
Retinal thermal	$R(\lambda)$	$\frac{W.m^{-2}}{sr}$	L_R	$28000/\alpha$	2.6×10^3	$28000/\alpha$	-	$71000/\alpha$	-
Retinal thermal, Weak visual stimulus**	$R(\lambda)$	$\frac{W.m^{-2}}{sr}$	L_{IR}	$6000/\alpha$	7.8×10^{-1}	$6000/\alpha$	-	$6000/\alpha$	-
IR radiation Eye		$W.m^{-2}$	E_{IR}	100	0	570	-	3200	-
* Small source defined as one with $\alpha < 0,011$ radian. Averaging field of view at 10000 s is 0,1 radian. ** Involves evaluation of non-GLS source									

Figure of Spectral distribution

Spectral distribution of YHL-ID-180-HB-VE

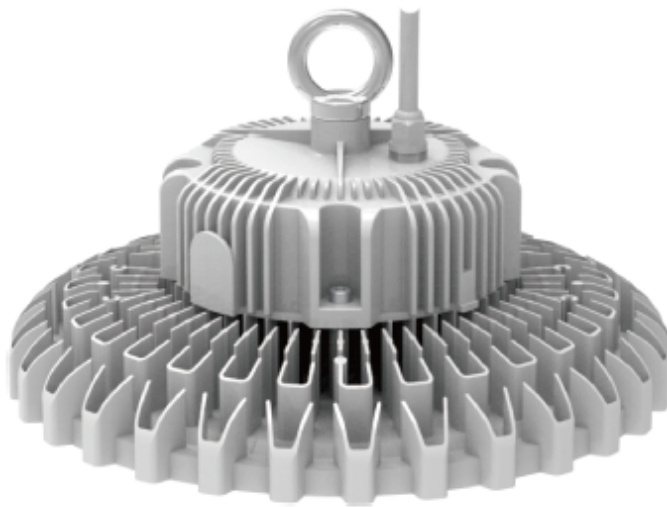


Spectral distribution of YHL-ID-200-HB-VE(IR)



Attachment 3 Manual instruction

LED High Bay Light Instruction Manual



Ver.A

Reminder

- We appreciate your choice!
- Please read the instruction manual before installation and keep it well.

⚠ Warning

- To avoid the accident of damage, falling, electric shock or fire, please do not reform the lamp or replace the accessories and confirm with us if you need to change the mounting methods.
- Please authorize the installation to qualified installation personnel and obey to the instruction manual. Any unsuitable installation will easily cause the accident of falling, electric shock and fire etc.
- Please cut off the power before installation or any maintenance of the lamp.
- Please cut off the power when it smokes or smells awfully since the accident of fire or electric shock may occur. Ask the qualified personnel for maintenance. Please do not dismantle the lamp by yourself since the accident may incur.
- Please do not touch the driver when the lamp works.

For type Y attachments:

if the external flexible cable or cord of this luminaire is damaged, it shall be exclusively replaced by the manufacturer or his service agent or a similar qualified person in order to avoid a hazard.

Application

With ultra high light efficiency and pure aluminum heat sink, utilizes high brightness LED chip, high-efficiency constant current constant voltage power driver, the LED high bay is designed for factory, workshop, warehouse, highway toll gate, gas station, supermarket, exhibition hall, stadium and other applications.

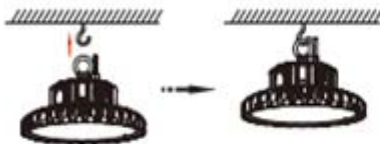
Technical Parameter

Input Voltage	AC100~240V	Lifespan	≥50000Hrs
Power Frequency	50/60Hz	Fixture Material	Aluminum Alloy
CRI	≥70	Working Temperature	-30~+50℃
Storing Temperature	-40~+65℃	Working Humidity	15%~90%RH
IP Rating	IP65	For indoor use	

Electrics



Installation Instruction



Troubleshooting & Solutions

Malfunction	Troubleshooting	Solutions
Not working	1.Check whether the power line is properly connected.	1.Reconnect the power wire.
	2.Check whether the power plug is loose.	2.Re-plug the loosen power plug.
	3.Driving power supply failure.	3.Replace with new qualified driver.
	4.LED chip is damaged.	4.Replace with new LED chip.
LED dim or flashing	1.The output of the driver is abnormal.	1.Replace with new qualified driver.
	2.LED chip breakdown.	2.Replace with new LED chip.

Item List

1.Lamp Body	1 pcs	☒
2.Instruction Manual (including Warranty Card & Item List)	1 pcs	☒
3.Quality Certificate	1 set	☒

Warranty

1. Due to quality issues, 5 years for free maintenance.
2. During the warranty period, the client shall send the failed parts by courier for inspection and repair. After inspection and repair, the supplier shall send the fixed parts or new parts back. Each party shall bear the freight cost accordingly.
3. Keep the warranty card as the warranty certificate.
4. The following conditions are not covered by the warranty, and the supplier provides maintenance services by charging maintenance fee:
 - (1) All human factors damages, including damages from operation, usage, storage unconformity with the instruction manual, abnormal working condition etc;
 - (2) Dismantling, maintenance, modification or unqualified repairing for the products without the supplier's authorization;
 - (3) No warranty cards and documents;
 - (4) Damages caused by user's improper delivery or due to force majeure (including fire, flood, thunder hit, earthquake etc).
5. All rights reserved.

Warranty Card

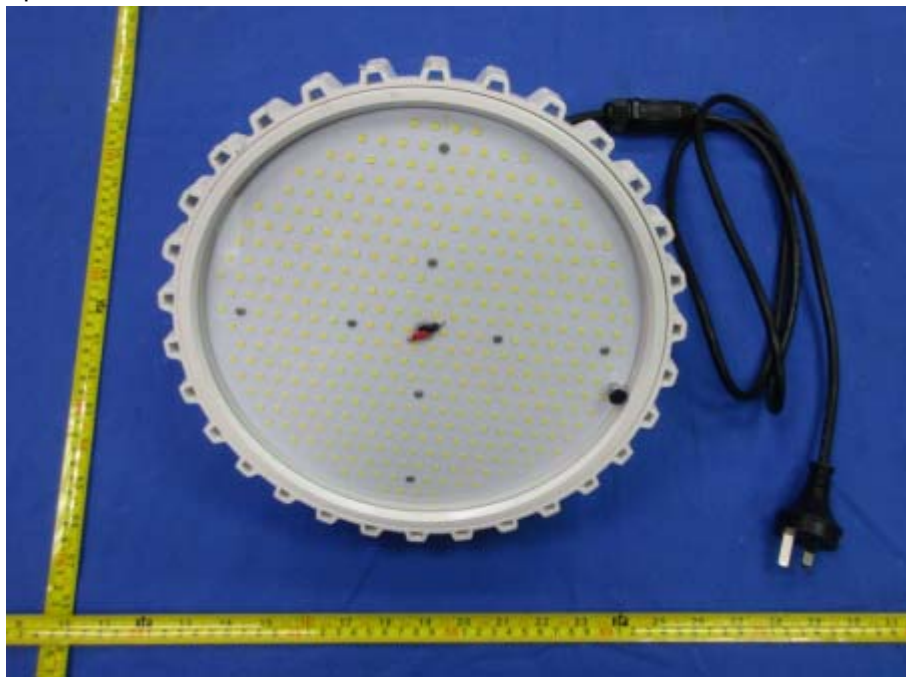
Name		Type	
Number		Date	
User		Tel./E-mail	

Date	Issue	Note

Notice: Please keep the warranty card. Send it together with failed parts.

Attachment 4 EUT Photos

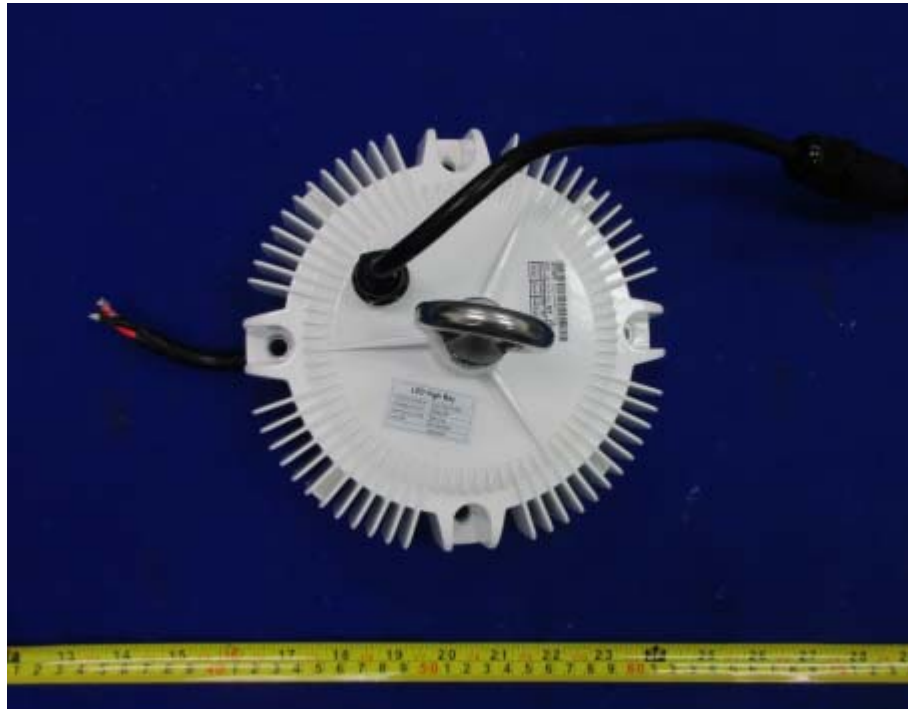
A.1 EUT photo-Top view of YHL-ID-180-HB-VE



A.2 EUT photo-Bottom view of YHL-ID-180-HB-VE



A.3 EUT photo-top view of LED driver (HBG-240-36A)



A.4 EUT photo-bottom view of LED driver (HBG-240-36A)



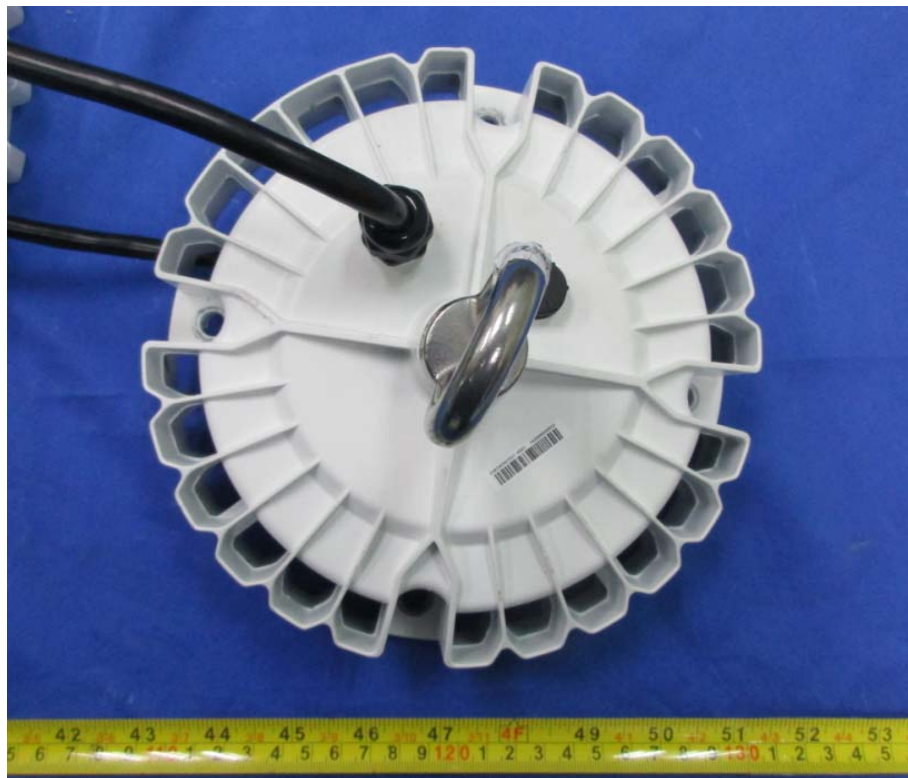
A.5 EUT photo-Top view of YHL-ID-200-HB-VE(IR)



A.6 EUT photo-Bottom view of YHL-ID-200-HB-VE(IR)



A.7 EUT photo-top view of LED driver (EUR-240S670ST)



A.8 EUT photo-top view of LED driver (EUR-240S670ST)



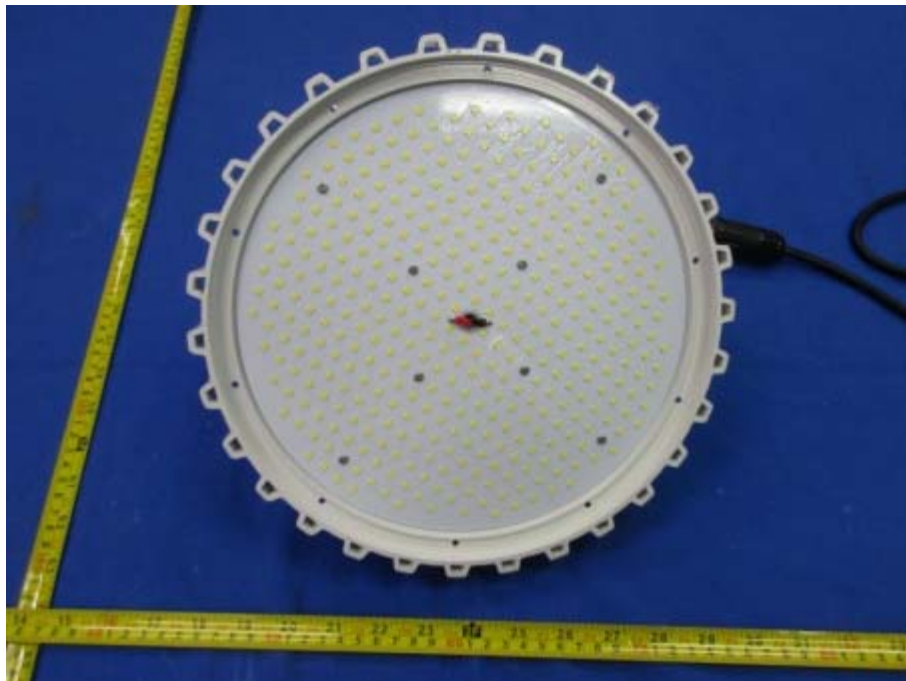
A.9 EUT photo- the hook



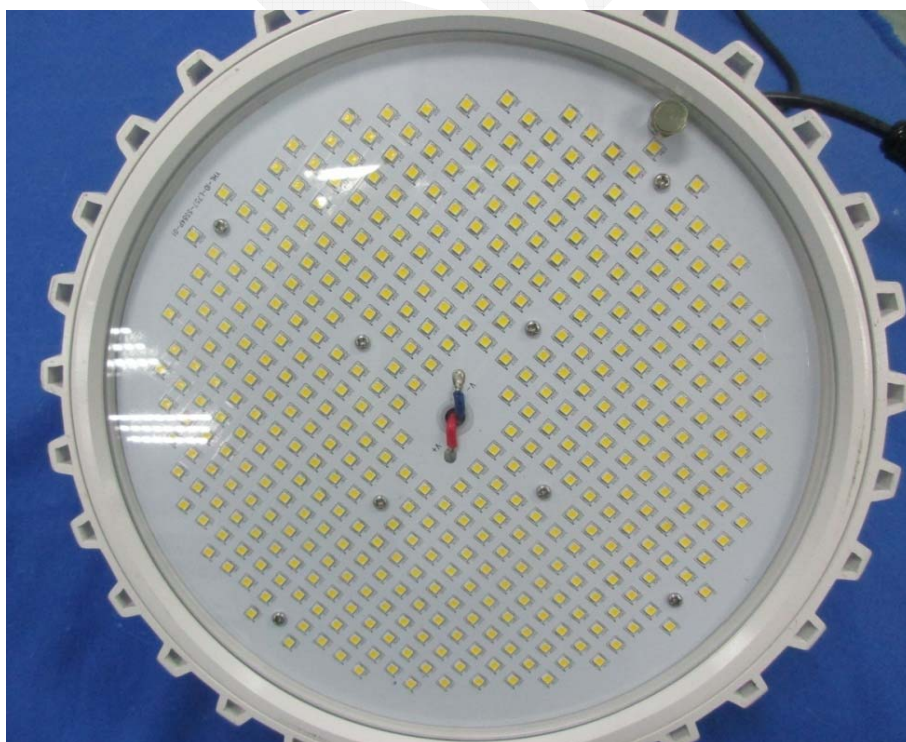
A.10 EUT photo- The way of LED driver and LED module connection



A.11 EUT photo- the LED board (YHL-ID-180-HB-VE)



A.12 EUT photo- the LED board (YHL-ID-200-HB-VE(IR))



A.13 EUT photo- The earthing



A.14 EUT photo- the cord anchorage



A.15 EUT photo- the cord anchorage



A.16 EUT photo- the wire connector



A.17 EUT photo- separated view of wire connector



A.18 EUT photo- the power cord



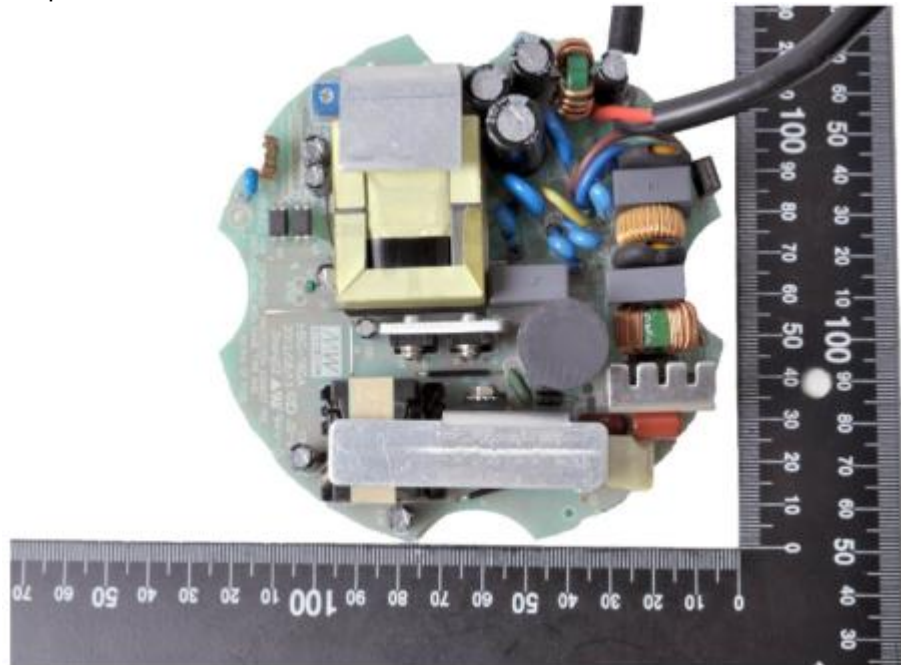
A.19 EUT photo- the plug



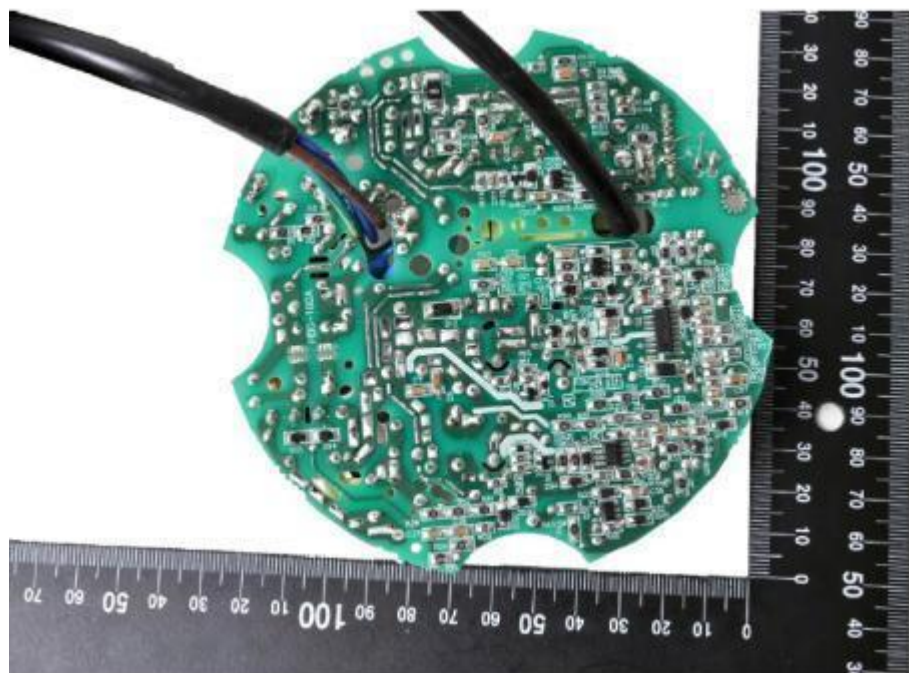
A.20 EUT photo- The inside view of driver



A.21 EUT photo- Top view of driver PCB



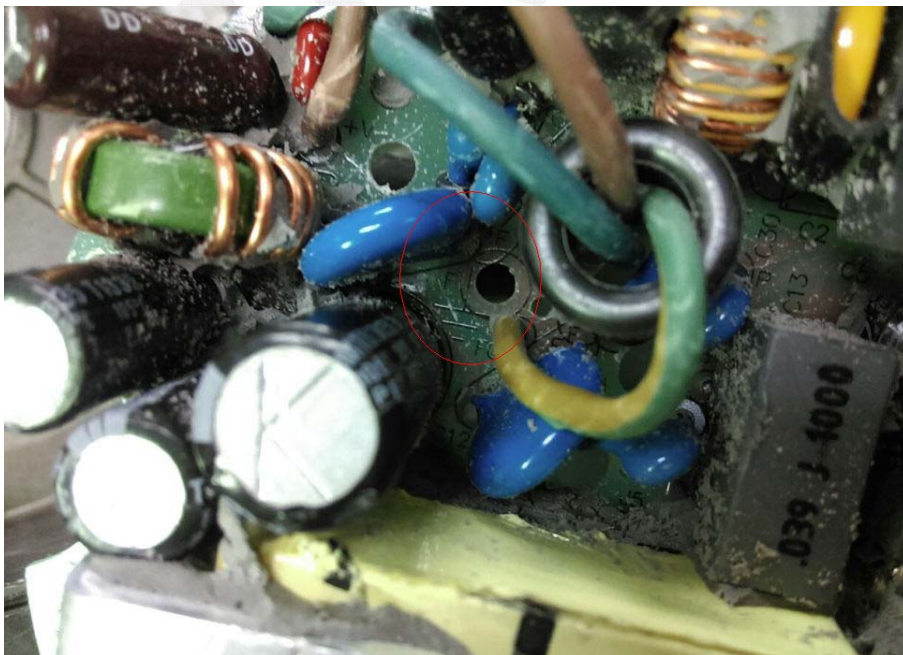
A.22 EUT photo- Bottom view of driver PCB



A.23 EUT photo- The earth terminal



A.24 EUT photo- The earth terminal



A.25 EUT photo- The earth connect part



Attachment 5 Circuit schematics diagram

Circuit schematics diagram



Attachment 6 Wire connector certification

ZERTIFIKAT ◆ CERTIFICATE ◆ 認定証書 ◆ CERTIFICADO ◆ CERTIFICAT

CERTIFICATE

No. B 14 09 87842 001



Product Service

Holder of Certificate: Dongguan de zhi hermetic
technique co.,ltd
Dalang Zhen Shi Xia Cun
523792 Dongguan city Guangdong Province
PEOPLE'S REPUBLIC OF CHINA



Certification Mark:



Product: Cable gland

The product was tested on a voluntary basis and complies with the essential requirements. The certification mark shown above can be affixed on the product. It is not permitted to alter the certification mark in any way. In addition the certification holder must not transfer the certificate to third parties. See also notes overleaf.

Test report no.: 64100140078701

Valid until: 2019-09-10

Date, 2014-09-12

Boris Ouyang
(Boris Ouyang)



Page 1 of 2



Product Service

CERTIFICATE

No. B 14 09 87842 001

Model(s):

M12-05, M12-08, M12L-05, M12L-08, M16-07,
M16-10, M20-12, M20-14, M20S-07, M20S-10,
M20L-12, M20L-14, M25-16, M25-18, PG7-05,
PG7-08, PG9-05, PG9-08, PG11-07, PG11-10,
PG13.5-07, PG13.5-10, PG16-12, PG16-14,
PG21-16, PG21-18, KJ-M16-11, KJ-PG9-07

Parameters:

Material of the cable glands:	Non-metallic
Mechanical properties:	With cable anchorage(Type B)
Impact category:	Category 8
Electrical properties:	With insulating characteristics
Degree of protection:	IP67 for KJ-PG9-07; IP68 for other
Temperature range:	-40°C to 120°C
Sealing system:	With a single orifice seal
Remarks: IPX8 depth: 2m, duration: 48h.	

Tested according to:

EN 50262/A2:2004

Production Facility(ies):

87842



Choose certainty.
Add value.

TÜV SÜD Certification and Testing (China) Co., Ltd Guangzhou Branch
5F, Communication Building, 163 Pingyuan Rd, Huangpu Ave, West Guangzhou, Guangdong, P. R. China

Dongguan de zhi hermetic technique co.,ltd
Dalang Zhen Shi Xia Cun, 523792 Dongguan city Guangdong
Province

Your Reference:	Our Reference/Name:	Telephone no./E-Mail:	Fax no.:	Date:	Total Page:
		+86 20 3815 3209 Molank.Liu@tuv-sud.cn	+86 20 38320478	12 September 2014	x

Subject: Certificates

Dear Sir or Madame,

We are pleased to attach your certificate no. :

B 14 09 87842 001 which entitles you to label your certified product(s) with the respective certification mark. Let us give you some additional information which we consider to be important for you:

- The product has to be accompanied by a user manual in the language of the country where it supposed to be sold.
- To ensure that validity of the certificate is not put at risk please inform us about any change in your production or of the product itself.
- The certification will allow you to sell your products easier and with less risks. The annual license fee will be 6 units for maintaining these advantages.

Further information for the use of our marks is contained in our testing and certification regulations. We look forward to our co-operation and will assist you at any time.

Yours sincerely

TÜV SÜD Certification and Testing (China)
Co., Ltd Guangzhou Branch

HSBC Bank (China) Company Limited
Guangzhou Branch
Account No.:
629-129339-011 (RMB)
009-129339-016 (USD)
SWIFT Code: HSBCCN33HGHZII

General Manager:
Mr. Likun Huang

Telephone: +86 20 3832 0006
Telefax : +86 20 3832 0478
www.tuv-sud.cn

TUV

TÜV SÜD Certification and Testing (China)
Co., Ltd Guangzhou Branch
5F, Communication Building,
163 Pingyuan Rd, Huangpu Ave, West
Guangzhou, Guangdong, P. R. China
510636



Product Service

Attestation of Conformity

No. N8A 14 09 87842 002

Holder of Certificate: Dongguan de zhi hermetic
technique co.,ltd
Dalang Zhen Shi Xia Cun
523792 Dongguan city Guangdong Province
PEOPLE'S REPUBLIC OF CHINA

Product: Cable gland

This Attestation of Conformity is issued on a voluntary basis according to the Low Voltage Directive 2014/35/EU relating to electrical equipment designed for use within certain voltage limits. It confirms that the listed equipment complies with the principal protection requirements of the directive and is based on the technical specifications applicable at the time of issuance. It refers only to the particular sample submitted for testing and certification. See also notes overleaf.

Test report no.: 64100140078701

Date, 2014-09-12

Boris Ouyang
(Boris Ouyang)

Valid until: 2019-09-10



After preparation of the necessary technical documentation as well as the EU conformity declaration the required CE marking can be affixed on the product. That declaration of conformity is issued under the sole responsibility of the manufacturer. Other relevant EU-directives have to be observed.

Page 1 of 2

TÜV SÜD Product Service GmbH - Zertifizierstelle - Ridlerstraße 65 - 80339 München - Germany

TÜV®



Product Service

Attestation of Conformity
No. N8A 14 09 87842 002

Model(s):

M12-05, M12-08, M12L-05, M12L-08, M16-07,
M16-10, M20-12, M20-14, M20S-07, M20S-10,
M20L-12, M20L-14, M25-16, M25-18, PG7-05,
PG7-08, PG9-05, PG9-08, PG11-07, PG11-10,
PG13.5-07, PG13.5-10, PG16-12, PG16-14,
PG21-16, PG21-18, KJ-M16-11, KJ-PG9-07

Parameters:

Material of the cable glands:	Non-metallic
Mechanical properties:	With cable anchorage (Type B)
Impact category:	Category 8
Electrical properties:	With insulating characteristics
Degree of protection:	IP67 for KJ-PG9-07; IP68 for other
Temperature range:	-40°C to 120°C
Sealing system:	With a single orifice seal
Remarks:	IPX8 depth: 2m, duration: 48h.

Tested according to:

EN 50262/A2:2004

ZERTIFIKAT ◆ CERTIFICATE ◆ 認証証書 ◆ CERTIFICADO ◆ CERTIFICAT

Attachment 7 Test Equipment List

BACL#	Equipment Description	Serial No	Model No	Last Cal	Cal Due
T-08-SF001	High temperature test chamber	201105083-3	DP1000	2015-09-10	2016-09-09
T-08-SF008	Hybrid Recorder	4#	DR240	2016-03-04	2017-03-03
T-08-SF033	Joint test finger	1108039	FZ-1101A	2016-05-21	2017-05-20
T-08-SF034	Ball pressure fixture	1108049	FZ-1104	2016-03-04	2017-03-03
T-08-SF077	Electron Balance	A06AI03094	3710A	2015-11-11	2016-11-10
T-08-SF036	Power meter	118706019	AN8721P	2015-11-03	2016-11-02
T-08-SF037	Needle wire Tester	N/A	FZ-5301A	2016-03-04	2017-03-03
T-08-SF039	Glow wire tester	N/A	5101A	2015-10-30	2016-10-29
T-08-SF040	Humidity tester	018 463	ESX-4CA	2016-03-04	2017-03-03
T-08-SF041	INSULATION TESTER	NH001899	T0S7200	2015-10-30	2016-10-29
T-08-SF064	Torque drive	N/A	50DPSK	2015-11-06	2016-11-05
T-08-SF068	AC.LEAKER CURRENT TESTER	---	228	2016-07-08	2017-07-07
T-08-SF070	Spring hammer	1109023	FZ-1103A	2015-12-01	2016-11-30
T-08-SF071	Wind cap	FTR0371209	FTR-3301	2015-01-22	2020-01-21
T-08-SF072	Digital Multi meter	17961914	15B	2016-03-04	2017-03-03
T-08-SF074	Digital Caliper	C10120 15085	0-150mm	2016-03-04	2017-03-03
T-08-SF081	Hi-pot Tester	1110006-022	CS2672C	2016-03-04	2017-03-03
T-08-SF191	AC POWER SUPPLY	N/A	HPC-3145	2016-04-01	2017-03-31
T-08-SF086	Stop watch	N/A	TA228	2016-03-04	2017-03-03
T-08-SF142	Digital real-time oscilloscope	B035221	TDS 220	2015-11-12	2016-11-11

*** End of Report ***