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CNAS L5775

Test Report issued under the responsibility of:

GTS

TEST REPORT

IEC 60598-2-1
Luminaires
Part 2: Particular requirements
Section 1: Fixed general purpose luminaires

Report Reference No. ..... :	**GTS201702000082S01**
Date of issue ..... :	February 23, 2017
Total number of pages ..... :	29 pages
Testing Laboratory..... :	**Global United Technology Services Co., Ltd.**
Address ..... :	No. 301-309, 3/F., Jinyuan Business Building, No. 2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China
Applicant's name ..... :	**AOK LED Light Company Limited**
Address ..... :	Building 1, St George's Science and Technology Industrial Park, Shajin Street, Shenzhen, Guangdong Province, China Zip 518104
Manufacturer's name……..:	**Same as applicant**
Address ..... :	Same as applicant
Test specification:	
Standard..... :	IEC 60598-2-1:1979 (First Edition) + A1:1987 used in conjunction with IEC 60598-1:2014 (Eighth Edition)
Test procedure ..... :	Test report
Non-standard test method……..:	N/A
Test Report Form No. ..... :	IEC60598_2_1C
Test Report Form(s) Originator..... :	Intertek Semko AB
Master TRF ..... :	2014-08
Test item description .....:	**LED Canopy Light**
Trade Mark..... :	AOK Quality, Honesty, Service and Innovation
Model/Type reference ..... :	See "General product information" for detail
Ratings ..... :	100-240 V~, 50/60 Hz Class I, IP66 Other rating see "General product information"

Vik Song

Vik Song
Project Engineer

Jericho

Jericho Cheng
Technical Director
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Summary of testing:

Testing location:

Global United Technology Services Co., Ltd.

No. 301-309, 3/F., Jinyuan Business Building, No. 2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China

Tests performed (name of test and test clause):

- IEC 60598-1:2014
- IEC 60598-2-1:1979
- IEC 60598-2-2:2012
- IEC 62031(ed.1);am1;am2

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

Water proof test (IPX6) (see test report No.: EBO1612009-R026)

This test report includes:

Attachment 1:

1 page of test report for IEC 60598-2-2:2011

Attachment 2:

- 8 pages of test report for national differences for Australia and New Zealand for standard AS/NZS 60598.1:2013 compared to IEC 60598-1(ed.7).

-20 pages of test report for national differences for Australia and New Zealand for standard AS/NZS 60598.2.2:2016 compared to IEC 60598-2-2(ed.3).

- 2 pages of test report for national differences for Australia and New Zealand for standard AS/NZS 60598.2.1:2014+A1:2016 compared to IEC 60598-2-1(ed.1); am1.

Attachment 3:

5 pages of test report for IEC 62031(ed.1);am2;am2 (for LED module);

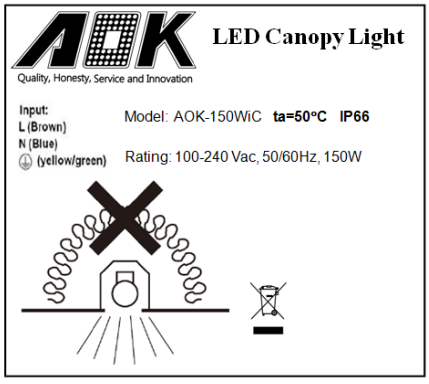
Attachment 4:

5 pages of photo documentation

Summary of compliance with National Differences:

The products fulfil the requirements of below standards: AS/NZS 60598.1:2013, AS/NZS 60598.2.1:2014, AS/NZS 60598.2.2: 2016

Copy of marking plates:



Size: 40mm x 20mm (Stick on supply cord)

Remark:

1. *The above label is draft of the artwork for marking plate pending approval by National Certification Bodies and they shall not be affixed to products prior to such approvals.*
2. *The marking plates of the other models are of the same pattern.*

Test item particulars..... :	
Equipment mobility .....:	--
Supply Connection.....:	Power cord without plug
Protection class .....:	Class I
Ddegree of protection .....:	IP 66
Possible test case verdicts:	
- test case does not apply to the test object.....:	N (N/A)
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement .....:	F (Fail)
Testing.....:	
Date of receipt of test item.....:	February 10, 2017
Date(s) of performance of tests.....:	February 10, 2017 - February 23, 2017

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.
Throughout this report a point is used as the decimal separator.

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Unless otherwise stated: (a) the results shown in this document refer only to the sample(s) tested and (b) such sample(s) are retained for 1 month. This document cannot be reproduced except in full, without prior approval of the company.

General product information:

LED Canopy Light powered by mains. Suitable for indoor and outdoor use.

Model list

Model	Rated power
AOK-75WiC, AOK-75WiC-RSB, AOK-75WiC-RSC, AOK-75WiC-SMA	75W
AOK-110WiC, AOK-110WiC-RSB, AOK-110WiC-RSC, AOK-110WiC-SMA,	110W
AOK-150WiC, AOK-150WiC-RSB, AOK-150WiC-RSC, AOK-150WiC-SMA	150W

Model difference:

Each model (75W/110W/150W) has two different constructions: recessed type and surface mounted type.

Model AOK-150Wic(type B) were selected to be tested, recessed type was assessed to AS/NZS 60598.2.2 and surface mounted type(type D) was tested to AS/NZS 60598.2.1

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.2 (0)	**GENERAL TEST REQUIREMENTS**		—
1.2 (0.1)	Information for luminaire design considered..... :	Standard Yes ☒ No ☐	—
1.2 (0.3)	More sections applicable..... :	Yes ☐ No ☒	—
1.4 (2)	**CLASSIFICATION**		—
1.4 (2.2)	Type of protection ..... :	Class I	—
1.4 (2.3)	Degree of protection ..... :	IP66	—
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**		—
1.5 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
1.5 (3.3)	Additional information		P
	Language of instructions	English	P
1.5 (3.3.1)	Combination luminaires		N
1.5 (3.3.2)	Nominal frequency in Hz	50/60Hz	P
1.5 (3.3.3)	Operating temperature		N
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		N
1.5 (3.3.8)	Limitation for semi-luminaires		N
1.5 (3.3.9)	Power factor and supply current		N
1.5 (3.3.10)	Suitability for use indoors		N
1.5 (3.3.11)	Luminaires with remote control		N
1.5 (3.3.12)	Clip-mounted luminaire – warning		N
1.5 (3.3.13)	Specifications of protective shields		N
1.5 (3.3.14)	Symbol for nature of supply		P
1.5 (3.3.15)	Rated current of socket outlet		N
1.5 (3.3.16)	Rough service luminaire		N
1.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments	Type Z	P

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
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
1.5 (3.3.21)	Non-replaceable and non-user replaceable light sources information provided	Non-user replaceable light sources	P
	Cautionary symbol		N
1.5 (3.3.22)	Controllable luminaires, classification of insulation provided		P
1.5 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P
1.6 (4)	**CONSTRUCTION**		—
1.6 (4.2)	Components replaceable without difficulty		P
1.6 (4.3)	Wireways smooth and free from sharp edges		P
1.6 (4.4)	**Lampholders**		**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) ..... :		—
	After test the lampholder comply with relevant standard sheets and show no damage		N
	After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation		N
	- bending test (N) ..... :		—
	After test the lampholder have not moved from its position and show no permanent deformation		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 resistant to tracking		N
1.6 (4.4.8)	Lamp connectors		N
1.6 (4.4.9)	Caps and bases correctly used		N
1.6 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N
1.6 (4.5)	**Starter holders**		**N**

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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		N
1.6 (4.7.2)	Test 8 mm live conductor		N
	Test 8 mm earth conductor		N
1.6 (4.7.3)	Terminals for supply conductors		N
1.6 (4.7.3.1)	Welded method and material		N
	- stranded or solid conductor		N
	- spot welding		N
	- welding between wires		N
	- Type Z attachment		N
	- mechanical test according to 15.8.2		N
	- electrical test according to 15.9		N
	- heat test according to 15.9.2.3 and 15.9.2.4		N
1.6 (4.7.4)	Terminals other than supply connection		N
1.6 (4.7.5)	Heat-resistant wiring/sleeves		N
1.6 (4.7.6)	Multi-pole plug		N
	- test at 30 N		N
1.6 (4.8)	**Switches**		**N**
	- adequate rating		N
	- adequate fixing		N
	- polarized supply		N
	- compliance with IEC 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..... :		—
1.6 (4.9.2)	Insulated linings and sleeves:		N
	Resistant to a temperature > 20 °C to the wire temperature or		N
	a) & c) Insulation resistance and electric strength		N
	b) Ageing test. Temperature (°C)..... :		N
1.6 (4.10)	**Double or reinforced insulation**		**N**

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		N
	Safe installation fixed luminaires		N
	Capacitors and switches		N
	Interference suppression capacitors according to IEC 60384-14		N
1.6 (4.10.2)	Assembly gaps:		N
	- not coincidental		N
	- no straight access with test probe		N
1.6 (4.10.3)	Retainment of insulation:		N
	- fixed		N
	- unable to be replaced; luminaire inoperative		N
	- sleeves retained in position		N
	- lining in lampholder		N
1.6 (4.11)	**Electrical connections and current-carrying parts**		**P**
1.6 (4.11.1)	Contact pressure		P
1.6 (4.11.2)	Screws:		N
	- self-tapping screws		N
	- 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 or mounting surface		P
1.6 (4.11.6)	Electro-mechanical contact systems		N
1.6 (4.12)	**Screws and connections (mechanical) 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 ..... :	Screws for fixing LED driver:1.2Nm	P
	Torque test: torque (Nm); part ..... :		N
1.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N
1.6 (4.12.4)	Locked connections:		N
	- fixed arms; torque (Nm) ..... :		N
	- lampholder; torque (Nm)..... :		N
	- push-button switches; torque 0,8 Nm ..... :		N
1.6 (4.12.5)	Screwed glands; force (Nm) ..... :		P
1.6 (4.13)	**Mechanical strength**		**P**

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm) ..... :		N
	- other parts; energy (Nm)..... :	Translucent cover ,Metal enclosure: 0.35Nm	P
	1) live parts		P
	2) 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		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		N
1.6 (4.14)	**Suspensions, fixings and means of adjusting**		**P**
1.6 (4.14.1)	Mechanical load:		P
	A) four times the weight		P
	B) torque 2,5 Nm		N
	C) bracket arm; bending moment (Nm) ..... :		N
	D) load track-mounted luminaires		N
	E) clip-mounted luminaires, glass-shelve. Thickness (mm) ..... :		N
	Metal rod. diameter (mm) ..... :		N
	Fixed luminaire or independent control gear without fixing devices		N
1.6 (4.14.2)	Load to flexible cables		N
	Mass (kg) ..... :		—
	Stress in conductors (N/mm²) ..... :		N
	Mass (kg) of semi-luminaire ..... :		—
	Bending moment (Nm) of semi-luminaire ..... :		N
1.6 (4.14.3)	Adjusting devices:		N
	- flexing test; number of cycles ..... :		N
	- strands broken ..... :		N
	- electric strength test afterwards		N

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N
1.6 (4.14.5)	Guide pulleys		N
1.6 (4.14.6)	Strain on socket-outlets		N
1.6 (4.15)	**Flammable materials**		**P**
	- glow-wire test 650°C..... :	See Test Table 1.15 (13.3.2)	P
	- spacing ≥30 mm		N
	- screen withstanding test of 13.3.1		N
	- screen dimensions		N
	- no fiercely burning material		N
	- thermal protection		N
	- electronic circuits exempted		N
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 surfaces**		**N**
	No lamp control gear..... :	Electronic LED drier is exempt from the requirements of this clause	N
1.6 (4.16.1)	Lamp control gear spacing:		N
	- spacing 35 mm		N
	- spacing 10 mm		N
1.6 (4.16.2)	Thermal protection:		N
	- in lamp control gear		N
	- external		N
	- fixed position		N
	- temperature marked lamp control gear		N
1.6 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N
1.6 (4.17)	**Drain holes**		**N**
	Clearance at least 5 mm		N
1.6 (4.18)	**Resistance to corrosion**		**N**
1.6 (4.18.1)	- rust-resistance		N
1.6 (4.18.2)	- season cracking in copper		N
1.6 (4.18.3)	- corrosion of aluminium		N
1.6 (4.19)	Igniters compatible with ballast		N
1.6 (4.20)	Rough service vibration		N

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.21)	**Protective shield**		**N**
1.6 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N
	Shield of glass if tungsten halogen lamps		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 ..... :	See Test Table 1.15 (13.3.2)	N
1.6 (4.22)	Attachments to lamps not cause overheating or damage		N
1.6 (4.23)	Semi-luminaires comply Class II		N
1.6 (4.24)	**Photobiological hazards**		**P**
1.6 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N
1.6 (4.24.2)	Retinal blue light hazard		P
	Luminaires with E_{thr} :		N
	a) Fixed luminaires	RG0	N
	- distance x m, borderline between RG1 and RG2.. :		N
	- marking and instruction according 3.2.23		N
	b) Portable and handheld luminaires		N
	- marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778		N
	Portable luminaires for children IEC 60598-2-10 and Mains socket outlet nightlights IEC 60598-2-12 not exceed RG1 at 200 mm according to IEC/62778		N
1.6 (4.25)	**Mechanical hazard**		**P**
	No sharp point or edges		P
1.6 (4.26)	**Short-circuit protection**		**N**
1.6 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N
1.6 (4.26.2)	Short-circuit test with test chain according 4.26.3		N
	Test chain not melt through		N
	Test sample not exceed values of Table 12.1 and 12.2		N
1.6 (4.27)	**Terminal blocks with integrated screwless earthing contacts**		**N**
	Test 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

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	After test, resistance < 0,05 Ω		N
	Voltage drop test, resistance < 0,05 Ω		N
1.6 (4.28)	**Fixing of thermal sensing control**		**N**
	Not plug-in or easily replaceable type		N
	Reliably kept in position		N
	No adhesive fixing if UV radiations from a lamp can degrade the fixing		N
	Not outside the luminaire enclosure		N
	Test of adhesive fixing:		N
	Max. temperature on adhesive material (°C)..... :		—
	100 cycles between t min and t max		N
	Temperature sensing control still in position		N
1.6 (4.29)	**Luminaires with non-replaceable light source**		**N**
	Not possible to replace light source		N
	Live part not accessible after parts have been opened by hand or tools		N
1.6 (4.30)	**Luminaires with non-user replaceable light source**		**N**
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		N
	Minimum two fixing means		N
1.6 (4.31)	**Insulation between circuits**		**P**
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3		P
	Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfil requirements according 4.31.1 – 4.31.3		N
1.6 (4.31.1)	SELV circuits		P
	Used SELV source		P
	Voltage ≤ ELV		P
	Insulating of SELV circuits from LV supply		P
	Insulating of SELV circuits from other non SELV circuits		N
	Insulating of SELV circuits from FELV		N
	Insulating of SELV circuits from other SELV circuits		N
	SELV circuits insulated from accessible parts according Table X.1		P
	Plugs not able to enter socket-outlets of other voltage systems		N

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Socket outlets does not admit plugs of other voltage systems		N
	Plugs and socket-outlets does not have protective conductor contact		N
1.6 (4.31.2)	FELV circuits		N
	Used FELV source		N
	Voltage ≤ ELV		N
	Insulating of FELV circuits from LV supply		N
	FELV circuits insulated from accessible parts according Table X.1		N
	Plugs not able to enter socket-outlets of other voltage systems		N
	Socket outlets does not admit plugs of other voltage systems		N
	Socket-outlets does not have protective conductor contact		N
1.6 (4.31.3)	Other circuits		N
	Other circuits insulated from accessible parts according Table X.1		N
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		N
	- conductive parts are connected together		N
	- test according 7.2.3 of above		N
	- conductive part not cause an electric shock in case of an insulation fault		N
	- equipotential bonding in master/slave applications		N
	- master luminaire provided with terminal for accessible conductive parts of slave luminaires		N
	- slave luminaire constructed as class I		N
1.6 (4.32)	**Overvoltage protective devices**		**N**
	Comply with IEC 61643-11		N
	External to control gear and connected to earth:		N
	- only in fixed luminaires		N
	- only connected to protective earth		N

1.7 (11)	**CREEPAGE DISTANCES AND CLEARANCES**	—

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7 (11.2)	Creepage distances and clearances ..... :	For class I construction: Approved SELV LED driver used; For class II construction: No value was specified for working voltage below 60VDC as the electric strength test voltage of 500V is considered sufficient.	P
	Working voltage (V) ..... :	100-240Vac(Input of LED driver) MAX.54Vdc(Input of LED module)	—
	Rated pulse voltage (kV)..... :		—
	Voltage form..... :	Sinusoidal ☒ Non-sinusoidal ☒	—
	PTI..... :	< 600 ☒ ≥ 600 ☐	—
	Impulse withstand category (Normal category II) (Category III Annex U)	Category II ☐ Category III ☐	—
1.8 (7)	**PROVISION FOR EARTHING**		—
1.8 (7.2.1 + 7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		P
	Resistance < 0,5 Ω ..... :	0.073 Ω	P
	Self-tapping screws used		N
	Thread-forming screws		N
	Thread-forming screw used in a grove		N
	Earth makes contact first		N
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N
	Protective earthing of the luminaire not via built-in control gear		N
1.8 (7.2.2 + 7.2.3)	Earth continuity in joints, etc.		P
1.8 (7.2.4)	Locking of clamping means		P
	Compliance with 4.7.3		P
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N
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

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Contact surface bare metal		P
1.8 (7.2.10)	Class II luminaire for looping-in		N
	Double or reinforced insulation to functional earth		N
1.8 (7.2.11)	Earthing core coloured green-yellow		P
	Length of earth conductor		P
1.9 (14)	**SCREW TERMINALS**		—
	Separately approved; component list ..... :	(see Annex 1)	P
	Part of the luminaire..... :	(see Annex 3)	N
1.9 (15)	**SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS**		—
	Separately approved; component list ..... :	(see Annex 1)	N
	Part of the luminaire..... :	(see Annex 4)	N
1.10 (5)	**EXTERNAL AND INTERNAL WIRING**		—
1.10 (5.2)	**Supply connection and external wiring**		**P**
1.10 (5.2.1)	Means of connection..... :	Supply cord without plug	P
	Outdoor luminaire has not PVC insulated external wiring if not class III or SELV ≤ 25 V a.c./60 V d.c. or protected from outdoor environment		N
1.10 (5.2.2)	Type of cable ..... :	H05VV-F	P
	Nominal cross-sectional area (mm²)..... :	3X1.0 mm²	P
	Cables equal to IEC 60227 or IEC 60245		P
1.10 (5.2.3)	Type of attachment, X, Y or Z	Type Z	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 not 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

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Clause	Requirement + Test	Result - Remark	Verdict
	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		P
	- no tying of cables into knots etc.		P
	- insulating material or lining		P
1.10 (5.2.10.1)	Cord anchorage for type X attachment:		N
	a) at least one part fixed		N
	b) types of cable		N
	c) no damaging of the cable		N
	d) whole cable can be mounted		N
	e) no touching of clamping screws		N
	f) metal screw not directly on cable		N
	g) replacement without special tool		N
	Glands not used as anchorage		N
	Labyrinth type anchorages		N
1.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment	Type Z	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		P
	- no movement of conductors		P
	- no damage of cable or cord		P
	- function independent of electrical connection		P
1.10 (5.2.11)	External wiring passing into luminaire		P
1.10 (5.2.12)	Looping-in 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		N
	Class III luminaire plug		N
	No unsafe compatibility		N

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Clause	Requirement + Test	Result - Remark	Verdict
1.10 (5.2.16)	Appliance inlets (IEC 60320)		N
	Installation couplers (IEC 61535)		N
	Other appliance inlet or connector according relevant IEC standard		N
1.10 (5.2.17)	No standardized interconnecting cables properly assembled		N
1.10 (5.2.18)	Used plug in accordance with		N
	- IEC 60083		N
	- other standard		N
1.10 (5.3)	**Internal wiring**		**P**
1.10 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		P
	- not delivered/ mounting instruction		N
	- factory assembled		P
	- socket outlet loaded (A) ..... :		N
	- temperatures ..... :	(see Annex 2)	N
	Green-yellow for earth only		P
1.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P
	Cross-sectional area (mm²) ..... :		P
	Insulation thickness		P
	Extra insulation added where necessary		N
1.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		N
	Adequate cross-sectional area and insulation thickness		N
1.10 (5.3.1.3)	Double or reinforced insulation for class II		N
1.10 (5.3.1.4)	Conductors without insulation		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.		N
	Joints, raising/lowering devices		N
	Telescopic tubes etc.		N

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Clause	Requirement + Test	Result - Remark	Verdict
	No twisting over 360°		N
1.10 (5.3.3)	Insulating bushings:		N
	- suitable fixed		N
	- material in bushings		N
	- material not likely to deteriorate		N
	- cables with protective sheath		N
1.10 (5.3.4)	Joints and junctions effectively insulated		N
1.10 (5.3.5)	Strain on internal wiring		P
1.10 (5.3.6)	Wire carriers		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**		—
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, settable and adjustable luminaires		N
	Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires		P
	Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements		N
	Basic insulation only accessible under lamp or starter replacement		N
	Protection in any position		P
	Double-ended tungsten filament lamp		N
	Insulation lacquer not reliable		N
	Double-ended high pressure discharge lamp		N
	Relevant warning according to 3.2.18 fitted to the luminaire		N
1.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N
1.11 (8.2.3.a)	Class II luminaire:		N
	- basic insulated metal parts not accessible during starter or lamp replacement		N
	- basic insulation not accessible other than during starter or lamp replacement		N

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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)	SELV circuits with exposed current carrying parts:		N
	Ordinary luminaire:		N
	- 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 ≥ 0,5 μF		N
	Portable plug connected luminaire with capacitor		N
	Other plug connected luminaire with capacitor		N
	Discharge device on or within capacitor		N
	Discharge device mounted separately		N

1.12 (12)	**ENDURANCE TEST AND THERMAL TEST**		—
1.12 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 4.13		—
1.12 (12.3)	Endurance test:		P
	- mounting-position ..... :	As normal used	—
	- test temperature (°C) ..... :	60	—
	- total duration (h)..... :	240	—
	- supply voltage: Un factor; calculated voltage (V) .. :	264	—
	- 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

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Clause	Requirement + Test	Result - Remark	Verdict
1.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	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 ..... :		—
	- 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 W:		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 ..... :	See Table 1.15 (13.2.1)	N

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Clause	Requirement + Test	Result - Remark	Verdict
1.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N
	- case of abnormal conditions ..... :		—
	- measured winding temperature (°C): at 1,1 Un ..... :		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un ..... :		—
	- calculated temperature of fixing point/exposed part (°C) ..... :		—
	Ball-pressure test ..... :	See Table 1.15 (13.2.1)	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		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: ..... :	See Table 1.15 (13.2.1)	N

1.13 (9)	**RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE**		—
1.13 (-)	If IP > IP 20 the order of tests as specified in clause 1.12		P
1.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		—
	- classification according to IP ..... :	IP66	—
	- mounting position during test ..... :	As normal used	—
	- fixing screws tightened; torque (Nm) ..... :		—
	- tests according to clauses ..... :	Clause 9.2.2 and 9.2.6	—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N
	b) no talcum in dust-tight luminaire		P
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		P
	d) i) For luminaires without drain holes – no water entry		P

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Clause	Requirement + Test	Result - Remark	Verdict
	d) ii) For luminaires with drain holes – no hazardous water entry		N
	e) no water in watertight luminaire		N
	f) no contact with live parts (IP 2X)		N
	f) no entry into enclosure (IP 3X and IP 4X)		N
	f) no contact with live parts (IP3X and IP4X)		N
	g) no trace of water on part of lamp requiring protection from splashing water		N
	h) no damage of protective shield or glass envelope		P
1.13 (9.3)	Humidity test 48 h	25°C, 93% R.H.	P
1.14 (10)	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		—
1.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø ..... :		—
	Insulation resistance (MΩ) ..... :		—
	SELV		P
	- between current-carrying parts of different polarity :		N
	- between current-carrying parts and mounting surface ..... :	100 MΩ(Required:1 MΩ)	P
	- between current-carrying parts and metal parts of the luminaire..... :	100 MΩ(Required:1 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 ..... :		N
	- between live parts and mounting surface ..... :	100 MΩ(Required:2 MΩ)	P
	- between live parts and metal parts..... :	Class I construction: 100 MΩ(Required: 2MΩ) Class II construction: 100 MΩ(Required: 4MΩ)	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

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Clause	Requirement + Test	Result - Remark	Verdict
1.14 (10.2.2)	Electric strength test		P
	Dummy lamp		N
	Luminaires with ignitors after 24 h test		N
	Luminaires with manual ignitors		N
	Test voltage (V)..... :		N
	SELV		P
	- between current-carrying parts of different polarity :		N
	- 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 ..... :		N
	- between live parts and mounting surface ..... :	1480V	P
	- between live parts and metal parts ..... :	Class I construction:1480V Class II construction:2960V	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 (10.3)	Touch current or protective conductor current (mA) :	Protective conductor current MAX. 0.57mA(limit:3.5mA) Touch current: MAX. 0.37mA(limit:0.7mA)	P

1.15 (13)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		—
1.15 (13.2.1)	Ball-pressure test ..... :	See Test Table 1.15 (13.2.1)	P
1.15 (13.3.1)	Needle-flame test (10 s)..... :	See Test Table 1.15 (13.3.1)	P
1.15 (13.3.2)	Glow-wire test (650°C)..... :	See Test Table 1.15 (13.3.2)	P
1.15 (13.4)	Proof tracking test (IEC 60112) ..... :	See Test Table 1.15 (13.4)	N

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Clause	Requirement + Test	Result - Remark	Verdict

1.7 (11.2)	**TABLES: Creepage distances and clearances**	N
Table 11.1	**Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages**	

RMS working voltage (V) not exceeding	50	150	250	500	750	1000
Creepage distances						
Required basic insulation, PTI ≥ 600	0,6	0,8	1,5	3	4	5,5
Measured						
Required basic insulation, PTI < 600	1,2	1,6	2,5	5	8	10
Measured						
Required supplementary insulation PTI ≥ 600	-	0,8	1,5	3	4	5,5
Measured						
Required supplementary insulation PTI < 600	-	1,6	2,5	5	8	10
Measured						
Required reinforced insulation	-	3,2	5	6	8	11
Measured						
Clearances						
Required basic insulation	0,2	0,8	1,5	3	4	5,5
Measured						
Required supplementary insulation	-	0,8	1,5	3	4	5,5
Measured						
Required reinforced insulation	-	1,6	3	6	8	11
Measured						

Table 11.2	**Minimum distances (mm) for non-sinusoidal pulse voltages**						
Rated pulse voltage (peak kV)	2,0	2,5	3,0	4,0	5,0	6,0	8,0
Required clearances	1,0	1,5	2	3	4	5,5	8
Measured							
Rated pulse voltage (peak kV)	10	12	15	20	25	30	40
Required clearances	11	14	18	25	33	40	60
Measured							
Rated pulse voltage (peak kV)	50	60	80	100	-	-	-
Required clearances	75	90	130	170	-	-	-
Measured							

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Clause	Requirement + Test	Result - Remark	Verdict

1.15 (13.2.1)	**TABLE: Ball Pressure Test of Thermoplastics**			**P**
Allowed impression diameter (mm) .....:				—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
Plastic cover	CHI MEI CORPORATION	75	1.0	
DC connector	Suzhou Exceedconn Technology co.,Ltd	125	1.1	
DC terminal block	WAGO Kontakttechnik Gmbh	125	1.2	
Supplementary information:--				

1.15 (13.3.1)	**TABLE: Needle-flame test (IEC 60695-11-5)**				P
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
DC connector	Suzhou Exceedconn Technology co.,Ltd	10	No	0	P
DC terminal block	WAGO Kontakttechnik Gmbh	10	No	0	P
Supplementary information:--					

1.15 (13.3.2)	**TABLE: Glow-wire test (IEC 60695-2-11)**				**P**
Glow wire temperature .....:	650°C				—
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Plastic cover	CHI MEI CORPORATION	30	No	0	P
Any flame or glowing of the sample extinguished within 30 s of withdrawing the glow-wire, and any burning or molten drop did not ignite the underlying parts (Yes/No).....:					-
Supplementary information:-					

1.15 (13.4)	**TABLE: Proof tracking test (IEC 60112)**		**N**
Test voltage PTI .....:		175 V	—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens	Verdict

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Clause	Requirement + Test	Result - Remark	Verdict

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Supplementary information:					

ANNEX 1	TABLE: Critical components information					P
Object / part No.	**Code**	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
Supply cord	B	Dongguan E-Jun Wire Co.,Ltd. (China)	H05VV-F	3x1.0 mm²	AS/NZS 60320.1:2012	SAA APPROVALS(Certificate No.:SAA132541EA)
Output cord of LED driver	B	DONGGUAN EVER UNITED ELECTRIC WIRE & CABLE CO LTD	SJTW	2 x 14AWG, 105°C, 300Vac	--	UL (E56549)
Input wire of luminaire	B	Zhejiang Jinniu Cable Co., Ltd	H05RN-F	2 x 0.75mm2	DIN EN 50525-2-21	VDE (40028195)
DC connector	B	Suzhou Exceedconn Technology co.,Ltd	EC02681-1023-0001	IP68	IEC 60598-1; IEC 60598-2-1; IEC 60598-2-2	Tested with appliance
DC terminal block	B	WAGO Kontakttechnik Gmbh	2060	63Vdc, 9A	IEC 60947-7-1	DEKRA(Report No.:2184109.50)
LED driver	B	MEAN WELL	HLG-185H-54	Input:100-240VAC; 50/60Hz; 2.1A; Output: 54Vdc; 3.45A; Class I; IP67; Independent Controller; ta=60°C, tc=80°C	AS/NZS IEC 61347.2.13:2013; AS/NZS 61347.1:2002	SAA APPROVALS(Certificate No.:SAA-162321-EA)
LED	B	LUMILEDS	LUXEON 3030 2D	IF=240mA VF=5.8-6.6V Viewing Angle:120° CCT: 2700-6500K	IEC 62471	Tested with appliance
LED module PCB		SINKPAD LLC	SP1	V-0. 120°C	--	UL (E348315)
Alt	B	Interchangeable	Interchangeable	V-0, 130°C	--	UL
Plastic cover	B	CHI MEI CORPORATION	PA-765A(+)	V-1, 80°C	--	UL (E56070)

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Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:
[1)] Provided evidence ensures the agreed level of compliance. See OD-CB2039.
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

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12		P
	Type reference ..... :	CAL40150	—
	Lamp used ..... :	HLG-185H-54	—
	Lamp control gear used ..... :	LED	—
	Mounting position of luminaire ..... :	As normal used	—
	Supply wattage (W)..... :	150W	—
	Supply current (A) ..... :	2.1	—
	Calculated power factor ..... :		—
	Table: measured temperatures corrected for ta =50 °C:		
	- abnormal operating mode..... :		—
	- test 1: rated voltage ..... :	100/240Vac	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage..... :	100 x1.06=106Vac 240 x1.06=254.4Vac	—
	- 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 measurements, (°C)

Part	Ambient	Clause 12.4 – normal					Clause 12.5 – abnormal	
		test 1	test 2		test 3	limit	test 4	limit
			106V	254.4V				
Input cord	50	--	63.9	62.8	--	90	--	--
tc of LED driver	50	75.6	74.9	72.7	--	90	--	--
Output cord near LED driver	50	--	64.3	62.7	--	90	--	--
DC connector	50	--	57.2	56.0	--	Ref.	--	--
Output cord near LED module	50	--	89.0	88.3	--	90	--	--

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Clause	Requirement + Test	Result - Remark	Verdict

LED module PCB	50	--	96.0	94.3	--	Ref.	--	--
Plastic cover	50	--	86.4	85.0	--	Ref.	--	--
Metal enclosure near LED driver	50	--	77.8	76.1	--	Ref.	--	--
Metal enclosure	50	--	80.2	79.2	--	Ref.	--	--
Mounting surface	50	--	58.4	55.0	--	90	--	--
Ambient	50	--	50.0	50.0	--	--	--	--
Supplementary information:								

ANNEX 3	**Screw terminals (part of the luminaire)**		—
(14)	**SCREW TERMINALS**		—
(14.2)	Type of terminal ..... :		—
	Rated current (A) ..... :		—
(14.3.2.1)	One or more conductors		N
(14.3.2.2)	Special preparation		N
(14.3.2.3)	Terminal size		N
	Cross-sectional area (mm²) ..... :		—
(14.3.3)	Conductor space (mm) ..... :		N
(14.4)	Mechanical tests		N
(14.4.1)	Minimum distance		N
(14.4.2)	Cannot slip out		N
(14.4.3)	Special preparation		N
(14.4.4)	Nominal diameter of thread (metric ISO thread)..... :	M	N
	External wiring		N
	No soft metal		N
(14.4.5)	Corrosion		N
(14.4.6)	Nominal diameter of thread (mm) ..... :		N
	Torque (Nm)..... :		N
(14.4.7)	Between metal surfaces		N
	Lug terminal		N
	Mantle terminal		N
	Pull test; pull (N)..... :		N
(14.4.8)	Without undue damage		N

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Clause	Requirement + Test	Result - Remark	Verdict
ANNEX 4	**Screwless terminals (part of the luminaire)**		—
(15)	**SCREWLESS TERMINALS**		—
(15.2)	Type of terminal ..... :	DC connector	—
	Rated current (A) ..... :	Tested with appliance	—
(15.3.1)	Material		P
(15.3.2)	Clamping		P
(15.3.3)	Stop		P
(15.3.4)	Unprepared conductors		P
(15.3.5)	Pressure on insulating material		P
(15.3.6)	Clear connection method		P
(15.3.7)	Clamping independently		N
(15.3.8)	Fixed in position		P
(15.3.10)	Conductor size		N
	Type of conductor		N
(15.5.1)	Terminals internal wiring		P
(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
(15.5.1.2)	Permanent connections: pull-off test (20 N)	4N	P
(15.5.2)	Electrical tests		P
	Voltage drop (mV) after 1 h (4 samples)..... :	7.4mv(Max.value was recorded)	P
	Voltage drop of two inseparable joints		P
	Number of cycles:	25 cycles	—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples) ..... :	7.5mv(Max.value was recorded)	P
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples) ..... :		N
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples)..... :	7.7mv(Max.value was recorded)	P
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples)..... :		N
(15.6)	Terminals external wiring		N
	Terminal size and rating		N
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) ..... :		N
	Pull test pin or tab terminals (4 samples); pull (N) ..... :		N

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

(15.6.3.1)	**TABLE: Contact resistance test**										N
	Voltage drop (mV) after 1 h										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)	--	--	--	--	--	--	--	--	--	N	
	Voltage drop of two inseparable joints					--				N	
	Voltage drop after 10th alt. 25th cycle									N	
	Max. allowed voltage drop (mV).....:					--				—	
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)	--	--	--	--	--	--	--	--	--	N	
	Voltage drop after 50th alt. 100th cycle									N	
	Max. allowed voltage drop (mV).....:					--				—	
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)	--	--	--	--	--	--	--	--	--	N	
	Continued ageing: voltage drop after 10th alt. 25th cycle									N	
	Max. allowed voltage drop (mV).....:					--				—	
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)	--	--	--	--	--	--	--	--	--	N	
	Continued ageing: voltage drop after 50th alt. 100th cycle									N	
	Max. allowed voltage drop (mV).....:					--				—	
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)	--	--	--	--	--	--	--	--	--	N	
Supplementary information:											

Attachment No. 1

IEC 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

TEST REPORT
IEC 60598-2-2
Luminaires
Part 2: Particular requirements
Section 2: Recessed luminaires

2.6	Marking	P
2.7	Construction	P
2.8	Creepage distances and clearances	P
2.9	Provision for earthing	P
2.10	Terminals	N
2.11	External and internal wiring	P
2.12	Protection against electric shock	P
2.13	Endurance tests and thermal tests	P
2.14	Resistance to dust and moisture	P
2.15	Insulation resistance and electric strength	P
2.16	Resistance to heat, fire and tracking	P

Attachment No. 2

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 60598-1
Australia AND New Zealand NATIONAL DIFFERENCES
Luminaires
Part 1: General requirements and tests

Differences according to ..... : AS/NZS 60598.1:2013 compared to IEC 60598-1(ed.7)

Attachment Form No. ..... : AS/NZS_ND_IEC 60598_2_2E

	National Differences		—
3.1	Move Item 3.2.21 from the centre column to the right hand column.		N
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 text after the second paragraph:		P
	In Australia and New Zealand, instructions and other texts required by this Standard shall be written in English.		P
3.3.7	Delete Clause 3.3.7 and replace with the following:		N
	Luminaires for use with metal halide lamps shall be provided with instructions that state the substance of the following: To avoid potential unsafe lamp failure, the luminaire shall be switched off for at least 30 minutes at least once a week. In addition, 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.		N
3.3.21	Add the following new Clause:		N
	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:		N

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict
	Switches that indicate an off position shall have contacts with an air break and comply with AS/NZS 3133 or AS/NZS 61058.1.		N
4.2A	Add the following new Clause after Clause 4.2:		N
	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:		P

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict
	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-outlets; — connecting lead (tails); — supply cord and plug; — adapter 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
	Delete the second and third paragraph.		P
	Add the following text after Note 3: 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 and 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. NOTE 1 Relevant requirements for equipment with integral pins are outlined in AS/NZS 3112. NOTE 2 PVC-insulated connection cords should not be used with outdoor luminaires in cold alpine locations.		P
5.2.2	Delete the first paragraph and replace with the following:		P

<table>
<tr><td colspan="4">IEC60598_2_2E ATTACHMENT</td></tr>
<tr><td>Clause</td><td>Requirement - Test</td><td>Result - Remark</td><td>Verdict</td></tr>
<tr><td></td><td>Supply cords used as a means of connection to the supply, when supplied by the luminaire manufacturer, shall be at least equal in their mechanical and electrical properties to those specified in IEC 60227 and IEC 60245, as indicated in Table 5.1, 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.</td><td></td><td>P</td></tr>
<tr><td></td><td>2 Table 5.1, delete rows 4 and 5 and replace with the following:</td><td></td><td>P</td></tr>
<tr><td></td><td><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></td><td></td><td>P</td></tr>
<tr><td></td><td>Delete the third paragraph and replace with the following:</td><td></td><td>P</td></tr>
<tr><td></td><td>To provide adequate mechanical strength, the nominal cross-sectional area of the conductors shall be not less than:</td><td></td><td>N</td></tr>
<tr><td></td><td>— 0,75 mm^2;</td><td></td><td>N</td></tr>
<tr><td></td><td>— 1,0 mm^2 for portable rough service luminaires.</td><td></td><td>N</td></tr>
<tr><td>5.2.16</td><td>Add the following text at the end of Clause 5.2.16:</td><td></td><td>N</td></tr>
<tr><td></td><td>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.</td><td></td><td>N</td></tr>
<tr><td></td><td>Luminaire couplers incorporated with the luminaire shall comply with IEC 61995-1.</td><td></td><td>N</td></tr>
<tr><td>5.2.18</td><td>Delete Clause 5.2.18 and replace with the following:</td><td></td><td>N</td></tr>
<tr><td></td><td>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.</td><td></td><td>N</td></tr>
<tr><td>5.2.19</td><td>Add the following new Clause:</td><td></td><td>N</td></tr>
<tr><td></td><td>Installation couplers incorporated within luminaires shall comply with the requirements of AS/NZS 61535.</td><td></td><td>N</td></tr>
</table>

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict
	Luminaires incorporating installation couplers may have means to allow further luminaires to be connected by cascading provided the through wiring is rated for the current rating of the installation coupler.		N
5.3.1	Delete the third paragraph and replace with the following:		N
	Internal wires coloured green, yellow or green/yellow combination shall be used for making 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:		N
	NOTE 3 Internal wires of other colours are not precluded from making protective earthing connections.		N
7.2.11	Delete the third paragraph and replace with the following:		N
	All conductors, whether internal or external, coloured green, yellow or green/yellow combination, shall only be connected to an earthing terminal.		N
8.2.1	Delete the first paragraph and Note 1 and replace with the following:		P
	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.		P
	Where a protective cover is used over a non-user-replaceable light source to provide 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.		N

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict
12.1	Add the following new Note after Table 12.1:		P
	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 mark or supply life data as maximum ambient air temperature based on 50,000 hrs. This t-life is often marked as t_a and is the temperature of the air in the vicinity of the component and is not related to the luminaire t_a. As such, luminaire manufacturers should measure air temperature in the vicinity of such components, within the luminaire, as even those complying with their t_c point measurements can still fail prematurely if t-life is exceeded.		P
13.3	Delete Clause 13.3 and replace with the following:		P
	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 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 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.	Plastic cover, DC connector, DC terminal block test and passed.	P

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict
13.3.2	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, 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.	Plastic cover, DC connector, DC terminal block test and passed.	P
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 within 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 60695.11.10. The sample of material classified in accordance with AS/NZS 60695.11.10 shall be no thicker than the relevant part.	No flame	N

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict
13.3.4	PCBs in luminaires shall be subject to the needle-flame test of AS/NZS 60695.11.5. 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.	Aluminium base for LED module PCB	N

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 60598-2-2
Australia and New Zealand NATIONAL DIFFERENCES
Luminaires
Part 2: particular requirements
Section two: Recessed luminaires

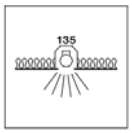
Differences according to ..... : AS/NZS 60598.2.2:2016 compared to IEC 60598-2-2(ed.3)

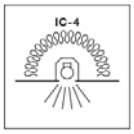
Attachment Form No. ..... : AU_NZS_ND_IEC 60598_2_2E

	APPENDIX ZZ		**—**
2.5	**Delete existing text and replace with the following**		**P**
2.5.101	**General**		**P**
	Luminaires shall be classified in accordance with the provisions of Section 2 of AS/NZS 60598.1, along with the following. Luminaires shall be classified according to their suitability for use near, or being covered with, building elements or thermal insulation, or both, in accordance with Clause 2.5.102 for Australia or Clause 2.5.103 for New Zealand. NOTE Appendix ZD provides information and guidance on the classifications, symbols, applications and general restrictions on recessed luminaires.		P
2.5.102	**Australian classifications**		**P**
	Luminiares shall be classified as one of the following: a) Non-IC b) Do-not-cover c) CA90 d) IC e) IC-4	Do-not-cover	P
2.5.103	**New Zealand classifications**		P

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict
	Luminiares shall be classified as one of the following: a) Non-IC b) Do-not-cover c) CA90 d) CA135 e) IC f) IC-4	Do-not-cover	P
2.6	**Delete existing text and replace with the following**		**P**
2.6.101	**General**		**P**
	The provisions of Clause 3 of AS/NZS 60598.1 apply, along with the following: - Clause 3.2.21 of AS/NZS 60598.1 is replaced by Clause 2.6.102. - The additional requirements of Clause 2.6.103 and Clause 2.6.104 apply, as applicable.		P
2.6.102	**Luminaire symbol marking**		**P**
	Recessed luminaires shall be marked with the symbol shown in the appropriate figure of this Clause, corresponding to their classification in accordance with Clause 2.5.		P
	Non-IC luminaires shall be marked with the symbol shown in Figure 101.  FIGURE 101 REQUIRED SYMBOL FOR NON-IC LUMINAIRES Exception: For 24 months from the date of publication of this Standard, Non-IC luminaires may be marked with the symbol shown in Figure 201 in lieu of the symbol shown in Figure 101. 24 months from the date of publication of this Standard, this exception will cease to apply.  FIGURE 201 PERMITTED EXCEPTION SYMBOL FOR NON-IC LUMINAIRES		N

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict
	Do-not-cover luminaires shall be marked with the symbol shown in Figure 102.  FIGURE 102 REQUIRED SYMBOL FOR DO-NOT-COVER LUMINAIRES	Figure 102 marked	P
	CA90 luminaires shall be marked with the symbol shown in Figure 103.  FIGURE 103 REQUIRED SYMBOL FOR CA90 LUMINAIRES Exception: For 24 months from the date of publication of this Standard, luminaires that comply with the requirements for CA80 luminaires in accordance with AS/NZS 60598.2.2:2001, New Zealand only Amendment A, may be marked with the symbol shown in Figure 202 in lieu of the symbol shown in Figure 103. Such CA80 luminaires are deemed to meet the requirements for CA90 luminaires. 24 months from the date of publication of this Standard, this exception will cease to apply.  FIGURE 202 PERMITTED EXCEPTION SYMBOL FOR CA90 LUMINAIRES (FOR LUMINAIRES THAT COMPLY WITH CA80 REQUIREMENTS OF NEW ZEALAND ONLY AMENDMENT A OF AS/NZS 60598.2.2:2001)		N

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict
	In New Zealand, CA135 luminaires shall be marked with the symbol shown in Figure 104.  FIGURE 104 REQUIRED SYMBOL FOR CA135 LUMINAIRES—NEW ZEALAND ONLY Exception: For 24 months from the date of publication of this Standard, CA135 luminaires may be marked with the symbol shown in Figure 203 in lieu of the symbol shown Figure 104. 24 months from the date of publication of this Standard, this exception will cease to apply.  FIGURE 203 PERMITTED EXCEPTION SYMBOL FOR CA135 LUMINAIRES—NEW ZEALAND ONLY		N

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict
	IC luminaires shall be marked with the symbol shown in Figure 105.  FIGURE 105 REQUIRED SYMBOL FOR IC LUMINAIRES Exception: For 24 months from the date of publication of this Standard, IC luminaires may be marked with the symbol shown in Figure 204 in lieu of the symbol shown in Figure 105. 24 months from the date of publication of this Standard, this exception will cease to apply.  FIGURE 204 PERMITTED EXCEPTION SYMBOL FOR IC LUMINAIRES		N
	IC-4 luminaires shall be marked with the symbol shown in Figure 106.  FIGURE 106 REQUIRED SYMBOL FOR IC-4 LUMINAIRES Exception: For 24 months from the date of publication of this Standard, IC-4 luminaires may be marked with the symbol shown in Figure 205 in lieu of the symbol shown in Figure 106. 24 months from the date of publication of this Standard, this exception will cease to apply.  FIGURE 205 PERMITTED EXCEPTION SYMBOL FOR IC-4 LUMINAIRES		N

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict
2.6.103	**Location and durability of marking**		**P**
	The marking required by Clause 2.6.102 shall be— a) legible, durable and visible when the luminaire is installed and viewed from behind; b) a minimum size of 25 mm × 25 mm; and c) permanently marked on the luminaire or on a durable swing tag permanently connected to the luminaire. The marking shall comply with the durability test requirements of AS/NZS 60598.1.		P
2.6.104	**Additional information to be supplied with the luminaire**		**P**
2.6.104.1	**General**		**P**
	All recessed luminaires shall be supplied with installation instructions containing the following information:		P
	a) The minimum clearance distance from the top of the luminaire to any normally flammable building element.	a) 100mm	P
	b) The minimum clearance distance from the top of the luminaire to any building insulation.	b) 100mm	P
	c) The minimum clearance distance from the side of the luminaire to any normally flammable building element.	c) 50mm	P
	d) The minimum clearance distance from the side of the luminaire to any building insulation.	d) 50mm	P
	If the minimum clearance distances from each side of the luminaire are different, or there are different minimum clearance distances for various types of normally flammable building element or building insulation, then each minimum clearance distance shall be stated separately. NOTE 1 See Appendix ZB for examples of methods satisfying the requirements for the supply of information on minimum clearance distances.		N
	If the luminaire is suitable for installing in a non-combustible enclosed space or non-combustible premade enclosure, and the minimum clearance distances required for installation in that space are different from the distances stated in accordance with the above, the minimum clearance distances for the installation, or premade enclosure details, shall be included in the instructions. NOTE 2 Installation in a non-combustible enclosed space may include installation in a rebate in a concrete slab, ceiling or wall.		N

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict
	In the section of the instructions where the minimum clearance distances are stated, the following warning shall be included: **WARNING — RISK OF OVERHEATING OR FIRE IF THE CLEARANCE DISTANCES ARE COMPROMISED.** NOTE 3 In some classifications of luminaire, the minimum clearance distance from the top or sides of the luminaire to building elements or insulation, or both, may actually be 0 mm (i.e. the material may abut the luminaire on the sides or the top). In these instances, a wording such as 'building insulation may abut the sides of the luminaire' is a suitable alternative to 'the minimum distance from the side of the luminaire to building insulation is 0 mm'.		P
	Luminaires with classification CA135 shall have the additional following warning included: **WARNING — RISK OF FIRE: THIS LUMINAIRE CANNOT BE INSTALLED ABUTTING THERMAL INSULATION OR OTHER BUILDING ELEMENTS THAT ARE NOT SUITABLE FOR EXPOSURE TO CONSTANT TEMPERATURES OF 135 °C.**		N
	Where a recessed luminaire is required to be mounted on a specific surface or has additional installation requirements to ensure adequate sealing to maintain its IP rating, the relevant information shall be supplied with the luminaire.		N

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict
2.6.104.2	Additional warning		N
2.6.104.2.1	General		N
	Luminaires shall have additional warnings in accordance with 2.6.104.2.2 for Australia and 2.6.104.2.3 for New Zealand.		N
2.6.104.2.2	Australia additional warning		N
	Non-IC luminaires shall be supplied with installation instructions containing the following warning: **WARNING — THIS LUMINAIRE IS NOT SUITABLE FOR INSTALLATION IN LOCATIONS WHERE THERMAL INSULATION IS PRESENT, OR MAY REASONABLY BE EXPECTED TO BE INSTALLED IN THE FUTURE, OR WHERE THERE IS A LIKELIHOOD OF OTHER COMBUSTIBLE MATERIAL, E.G. LEAVES OR VERMIN DEBRIS, ETC. COLLECTING ON OR AROUND THE LUMINAIRE. IT IS NOT SUITABLE FOR DOMESTIC INSTALLATIONS OR INSTALLATION IN RESIDENTIAL AREAS OF NON-DOMESTIC INSTALLATIONS(RESIDENTIAL INSTITUTIONS, HOTELS, BOARDING HOUSES, HOSPITALS, ACCOMMODATION HOUSES, MOTELS, HOSTELS AND THE LIKE).**		N
2.6.104.2.3	**New Zealand additional warning**		P
	Non-IC luminaires and Do-Not-Cover luminaires shall be supplied with installation instructions containing the following warning: **WARNING — THIS LUMINAIRE IS NOT SUITABLE FOR INSTALLATION IN LOCATIONS WHERE THERMAL INSULATION IS PRESENT, OR MAY REASONABLY BE EXPECTED TO BE INSTALLED IN THE FUTURE, OR WHERE THERE IS A LIKELIHOOD OF OTHER COMBUSTIBLE MATERIAL, E.G. LEAVES OR VERMIN DEBRIS, ETC. COLLECTING ON OR AROUND THE LUMINAIRE. IT IS NOT SUITABLE FOR DOMESTIC INSTALLATIONS OR INSTALLATION IN RESIDENTIAL AREAS OF NON-DOMESTIC INSTALLATIONS(RESIDENTIAL INSTITUTIONS, HOTELS, BOARDING HOUSES, HOSPITALS, ACCOMMODATION HOUSES, MOTELS, HOSTELS AND THE LIKE).**		P
2.6.105	**Luminaires intended for use with independent controlgear**		P

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict
	For luminaires intended for use with independent controlgear, pictorial diagrams showing all dimensions for safe installation of the independent controlgear shall be included in the installation instructions.		P
	For luminaires not supplied with, but intended for use with, independent controlgear, the instructions supplied with the recessed luminaire shall specify the brand(s) and model(s) of independent controlgear that may be used.		N
	For luminaires that may be used with supplied independent controlgear or other independent controlgear, the instructions supplied with the recessed luminaire shall specify the brand(s) and model(s) of any other independent controlgear that may be used.		N
	The information on brand(s) and model(s) shall be in the instructions supplied with the luminaire or on a website referenced in the instructions supplied with the luminaire.		N
2.6.106	**Compliance**		**P**
	Compliance with Clauses 2.6.101 to 2.6.105 is checked by inspection and the relevant tests of AS/NZS 60598.1.		P
2.7	**Delete existing text and replace with the following:**		**P**
2.7.101	**General**		**P**
	The provisions of Section 4 of AS/NZS 60598.1 apply, along with the following.		P
2.7.102	**Thermal protection devices**		**N**
	Thermal protection devices that operate to enable the luminaire to comply with the requirements of this Standard shall be integral to, or permanently attached immediately adjacent to, the luminaire light source enclosure. Thermal protection devices that operate to enable the luminaire to comply with the requirements of this Standard shall not be separate devices or in independent controlgear. NOTE Thermal protection devices are also known as ‘thermal cut-outs’.		N
	Single operation non-self-resetting thermal protection devices that are user replaceable are not permitted.		N

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict
	Electronic controls that regulate the light output during abnormal operation tests to enable the luminaire to comply with the requirements of this Standard shall comply with Clause 2.7.103.		N
	Thermal protection devices, excluding electronic controls complying with Clause 2.7.103, that operate to enable the luminaire to comply with requirements of this Standard shall comply with IEC 60730-1, in conjunction with the relevant part of the IEC 60730-2 series.		N
	The number of cycles of operation declared in accordance with IEC 60730-1:2013(see Clause 6.10 and 6.11 of that Standard) shall not be less than the following:		N
	a) Self-resetting thermal protection device 10 000		N
	b) Voltage maintained non-self-resetting thermal protection device1 000		N
	c) Other non-self-resetting thermal protection device30		N
2.7.103	**Electronic controls**		**N**
	The operation, or malfunction, of electronic controls that are used to regulate the operation of the light source to enable the luminaire to comply with requirements of this Standard (either during normal or abnormal operation) shall not result in a safety hazard.		N
	Such electronic controls are required to comply with a), b), c) or d) below:		N
	a) Electronic controls that operate during any test of this Standard and fully turn off the light source shall incorporate the operation of a thermal protection device component that complies with IEC 60730-1 with the number of cycles of operation declared in accordance with Clause 2.7.102.		N
	b) Electronic controls that operate during any test of this Standard and do not fully turn off the light source shall be bypassed and the relevant test shall be repeated. The luminaire shall omply with the requirements of the relevant test with the electronic control bypassed and any remaining device that operates shall comply with IEC 60730-1 with the number of cycles of operation declared in accordance with Clause 2.7.102. NOTE This does not mean that any device has to operate to enable compliance with the relevant test.		N

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict
	c) Electronic controls shall comply with the appropriate part of the AS/NZS 61347 series and incorporate a thermal protective device that has been tested to the number of cycles of operation declared in accordance with Clause 2.7.102.		N
	d) Electronic controls with programmable components (including embedded software) shall comply with IEC 62733, unless the luminaire complies with the requirements of this Standard with the electronic controls bypassed.		N
2.7.104	**Controlgear**		**P**
	All controlgear (including controlgear that is a component part and all independent controlgear) that is supplied with, or specified in, the instructions supplied with the luminaire for use with the luminaire shall be assessed with the luminaire to this Standard and shall, in addition, comply with the appropriate part of the AS/NZS 61347 series.		P
2.13	**Delete existing text and replace with the following:**		**P**
2.13.101	**General**		**P**
	The provisions of Section 12 of AS/NZS 60598.1 apply together with the requirements of this Clause (Clause 2.13).	Do-not-cover	P
	Clause12.4 and 12.5 of AS/NZS 60598.1 are applied in conjunction with the following:		P
	a) For Non-IC and Do-not-cover luminaires, the requirements of Clauses12.4 and 12.5 of AS/NZS 60598.1 are modified by Clause 2.13.102.		P
	b) For CA90 and CA135 luminaires, the requirements of Clauses 12.4 and 12.5 of AS/NZS 60598.1 are modified by Clause 2.13.103.		N
	c) For IC and IC-4 luminaires, the requirements of Clauses 12.4 and 12.5 of AS/NZS 60598.1 are modified by Clause 2.13.104.		N
2.13.102	**Thermal tests for Non-IC and Do-not-cover luminaires**		**P**
2.13.102.1	**Normal operation test for Non-IC and Do-not-cover luminaires**		**P**
	Non-IC and Do-not-cover luminaires shall be tested in accordance with the requirements of Paragraph ZA3 in Appendix ZA.	See appendix table 1 for details.	P

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict
	When the luminaire is tested in accordance with Paragraph ZA3, no temperature shall exceed—		P
	a) 90 °C on the luminaire mounting surface, or on any of the internal surfaces of the side and top of the test box, or on the surface of any building element installed in accordance with the manufacturer's instructions;		P
	b) for Do-not-cover luminaires only—90 °C on the surface of any simulated building element or insulation; and		P
	c) for other parts, the appropriate values given in Tables 12.1 and 12.2 of AS/NZS 60598.1.		P
	There shall be no damage to the luminaire such as scorching, deformation or melting. During the test, no thermal protection device or electronic control that fully turns off the light source within the luminaire or independent controlgear shall operate.		P
2.13.102.2	**Abnormal operation test for Do-not-cover luminaires**		**P**
	Do-not-cover luminaires shall be tested in accordance with the requirements of Paragraph ZA5.	See appendix table 2 for details.	P
	When the luminaire is tested in accordance with Paragraph ZA5, no temperature shall exceed—		P
	a) 90 °C on the luminaire mounting surface; and		P
	b) 130 °C on the surface of insulation.		P
	There shall be no damage to the luminaire such as scorching, deformation or melting. During the test, thermal protective devices or electronic controls within the luminaire may operate, however, the thermal protection devices of any independent controlgear shall not operate to limit temperatures.		P
2.13.103	**Thermal tests for CA90 and CA135 luminaires**		**N**
2.13.103.1	**Normal operation test for CA90 and CA135 luminaires**		**N**
	CA90 and CA135 luminaires shall be tested in accordance with the requirements of Paragraph ZA4.		N
	When the luminaire is tested in accordance with Paragraph ZA4, no temperature shall exceed—		N
	a) 90 °C on the luminaire mounting surface, or on any of the internal surfaces of the side and top of the test box, or on the surface of any building element installed in accordance with the manufacturer's instructions;		N

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict
	b) for CA90 luminaires—90 °C on the outside surface of the luminaire accessible to the relevant test probe of Clause 2.14;		N
	c) for CA135 luminaires—135 °C on the outside surface of the luminaire accessible to the relevant test probe of Clause 2.14; and		N
	d) for other parts, the appropriate values given in Tables 12.1 and 12.2 of AS/NZS 60598.1.		N
	There shall be no damage to the luminaire such as scorching, deformation or melting. During the test, no thermal protection device or electronic control that fully turns off the light source within the luminaire or independent controlgear shall operate.		N
2.13.103.2	**Abnormal operation test for CA90 and CA135 luminaires**		**N**
	CA90 and CA135 luminaires shall be tested in accordance with the requirements of Paragraph ZA5.		N
	When the luminaire is tested in accordance with Paragraph ZA5, no temperature shall exceed—		N
	a) 90 °C on the luminaire mounting surface;		N
	b) for CA90 luminaires—130°C on the outside surface of the luminaire accessible to the relevant test probe of Clause 2.14; and		N
	c) for CA135 luminaires—150°C on the outside surface of the luminaire accessible to the relevant test probe of Clause 2.14.		N
	There shall be no damage to the luminaire such as scorching, deformation or melting. During the test, thermal protection devices or electronic controls within the luminaire may operate, however, the thermal protection devices of any independent controlgear shall not operate to limit temperatures.		N
2.13.104	**Thermal tests for IC and IC-4 luminaires**		**N**
	IC and IC-4 luminaires shall be tested in accordance with the requirements of Paragraph ZA6.		N
	When the luminaire is tested in accordance with Paragraph ZA6, no temperature shall exceed—		N
	a) 90°C on the luminaire mounting surface;		N
	b) 90°C on the outside surface of the luminaire accessible to the relevant test probe of Clause 2.14; and		N

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict
	c) for other parts, the appropriate values given in Tables 12.1 and 12.2 of AS/NZS 60598.1.		N
	There shall be no damage to the luminaire such as scorching, deformation or melting. During the test, no thermal protection device, or electronic control that fully turns off the light source, within the luminaire or independent controlgear shall operate.		N
2.14	**Delete existing text and replace with the following:**		**N**
2.14.101	**General**		**N**
	The provisions of Section 9 of AS/NZS 60598.1 apply, along with the following.		N
	For luminaires with an IP classification greater than IP20, and for CA90, CA135, IC and IC-4 luminaires, the order of the tests specified in Section 9 of AS/NZS 60598.1 shall be as specified in Clause 2.3 of this Standard.		N
2.14.102	**Ingress test for CA90 and IC luminaires**		**N**
	Solid foreign objects shall have limited access to the hot surfaces of CA90 and IC luminaires.		**N**
	Test probe19 of IEC 61032 shall be applied without appreciable force to all external surfaces and any opening of the luminaire.Test probe 19 shall not be applied to the access face.		N
	The 5.6 mm diameter of the probe shall not enter into an area where the temperature of any surface(including parts of the luminaire or the lamp) exceeds the temperature limit for ‘mounting surface: normally flammable surface’ of AS/NZS 60598.1, when the surface is measured while the luminaire is operated in accordance with the thermal test conditions of Paragraph ZA4 for CA90 luminaires and Paragraph ZA6 for IC luminaires.		N
2.14.103	**Ingress test for CA135 luminaires—New Zealand only**		**N**
2.14.103.1	Solid foreign objects shall have some access to the hot surfaces of CA135 luminaires.		N
	Compliance is verified in accordance with Clauses 2.14.103.2 and 2.14.103.3.		N
2.14.103.2	Test probe 1 of IEC 61032 shall be applied without appreciable force to all external surfaces and any opening of the luminaire. Test probe 1 is not applied to the access face.		N

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict
	The 50 mm diameter of the probe shall not enter into an area where the temperature of any surface(including parts of the luminaire or the lamp) exceeds a value of 135 °C, when the surface is measured while the luminaire is operated in accordance with the thermal test conditions of Paragraph ZA4.		N
2.14.103.3	The total area of all openings in the luminaire body that allows airflow through the luminaire (i.e. airflow between the ceiling/wall space and the illuminated area), excluding openings in the access face, shall be no more than 5 % of the area of the opening in the mounting surface (opening in mounting surface as required by the manufacturer to insert the luminaire).		N
2.14.104	**Ingress test for IC-4 luminaires**		**N**
	Solid foreign objects shall have restricted access to the hot surfaces of IC-4 luminaires and restricted access to the open area that allows airflow through the luminaire (i.e. between the area that the body of the luminaire is located in and the area that the light source illuminates).		N
	The IP4X probes of AS 60529 shall be applied to the complete luminaire and any opening of the luminaire including the access face.		N
	The IP4X probes of AS 60529 shall be applied without appreciable force and shall not enter any area of the luminaire where the temperature of any surface (including parts of the luminaire or the lamp) exceeds the temperature limit for ‘mounting surface: normally flammable surface’ of AS/NZS 60598.1, when the surface is measured while the luminaire is operated in accordance with the thermal test conditions of Paragraph ZA6.		N
	With the luminaire installed in accordance with the manufacturer’s instructions, the IP4X probes of AS 60529 shall not be able to pass from the illuminated area into the area where the body of the luminaire is situated.		N
APPENDIX ZA	**THERMAL TEST PROCEDURES FOR RECESSED LUMINAIRES**		**—**
ZA1	GENERAL		P
ZA2	TEST BOX		P
ZA3	TEST PROCEDURE FOR NON-IC AND DO-NOT-COVER LUMINAIRES	DO-NOT-COVER LUMINAIRES	—

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict
ZA3.1	General		P
ZA3.2	Test set-up		P
ZA3.2.1	General		P
ZA3.2.2	Non-IC luminaires		N
ZA3.2.3	Do-not-cover luminaires		P
ZA3.2.4	Test requirements and procedure		P
ZA4	TEST PROCEDURE FOR CA90 AND CA135 LUMINAIRES		—
ZA4.1	General		N
ZA4.2	Test set-up		N
ZA4.3	Test requirements and procedure		N
ZA5	TEST PROCEDURE FOR ABNORMAL OPERATION—DO-NOT COVER, CA90 AND CA135 LUMINAIRES	DO-NOT-COVER LUMINAIRES	—
ZA5.1	General		P
ZA5.2	Test set-up		P
ZA5.3	Test requirements and procedure		P
ZA6	TEST PROCEDURE FOR NORMAL OPERATION—IC AND IC-4 LUMINAIRES		—
ZA6.1	Test set-up		N
ZA6.2	Test requirements and procedure		N

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict

Appendix table 1	**TABLE: Normal operation test for do-not-cover luminaires of clause 2.13.102.1**		P
	Type reference ..... :	AOK-150WiC	—
	Lamp used..... :	LED	—
	Lamp control gear used..... :	HLG-185H-54	—
	Mounting position of luminaire..... :	As normal use	—
	Supply wattage (W) ..... :	150W	—
	Supply current (A)..... :	2.1	—
	Calculated power factor..... :	--	—
	Table: measured temperatures corrected for ta = 50 °C:		P
	- abnormal operating mode ..... :	--	—
	- test 1: rated voltage..... :	--	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage..... :	1.06 x 240V=106V 1.06 x 240V=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 measurements, (°C)

Part	Ambient	Clause 12.4 – normal					Clause 12.5 – abnormal	
		test 1	test 2		test 3	limit	test 4	limit
			106V	254.4V				
Input cord	50	--	68.2	64.3	--	90	--	--
tc of LED driver	50	--	77.8	75.4	--	90	--	--
Output cord near LED driver	50	--	67.5	65.1	--	90	--	--
DC connector	50	--	58.4	56.5	--	Ref.	--	--
Output cord near LED module	50	--	89.8	89.1	--	90	--	--
LED module PCB	50	--	100.8	98.7	--	Ref.	--	--
Plastic cover	50	--	88.6	86.5	--	Ref.	--	--

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict

Metal enclosure near LED driver	50	--	80.1	78.5	--	Ref.	--	--
Metal enclosure	50	--	84.2	81.3	--	Ref.	--	--
Mounting surface	50	--	58.9	56.1	--	90	--	--
Building element	50	--	77.6	75.3	--	90	--	--
Building insulation	50	--	74.1	71.8	--	90	--	--

Supplementary information:

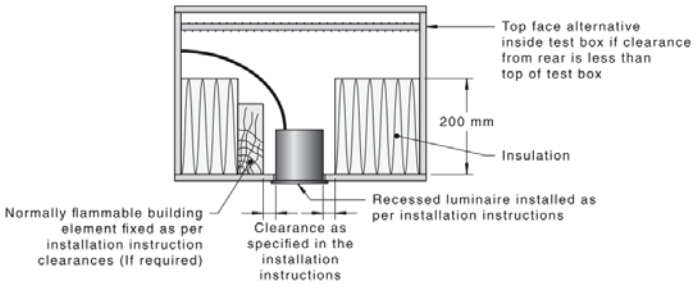
1. The test is run until temperatures have stabilized or 8 h have elapsed.

2. The dimensions of the test box shall be 900 mm wide × 900 mm long × 300 mm high.

3. The minimum horizontal distance from the side of the luminaire to the side of the test box shall be 75 mm and the minimum vertical distance from the top of the luminaire to the underside of the test box top shall be 75 mm.

4. Thermal insulation to a height of 200mm is added to the test box with the clearance specified in the installation instructions maintained from the luminaire.

5. mounting condition



IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict

Appendix table 2	**TABLE: Abnormal operation tests for do-not-cover luminaires of clause 2.13.102.2**		P
	Type reference ..... :	AOK-150WiC	—
	Lamp used..... :	LED	—
	Lamp control gear used..... :	HLG-185H-54	—
	Mounting position of luminaire..... :	As normal use	—
	Supply wattage (W) ..... :	150W	—
	Supply current (A)..... :	2.1	—
	Calculated power factor..... :	--	—
	Table: measured temperatures corrected for ta = 50 °C:		P
	- abnormal operating mode ..... :	See clause ZA5	—
	- test 1: rated voltage..... :	--	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage..... :	--	—
	- 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..... :	1.1 x100V=110V 1.1 x 240V=264V	—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :	--	—

Temperature measurements, (°C)

Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal		
		test 1	test 2	test 3	limit	test 4		limit
						110V	264V	
Building insulation	50	--	--	--	--	107.7	105.6	130
Mounting surface	50	--	--	--	--	86.1	84.3	90

Attachment No. 2

IEC60598_2_2E ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict

Supplementary information:

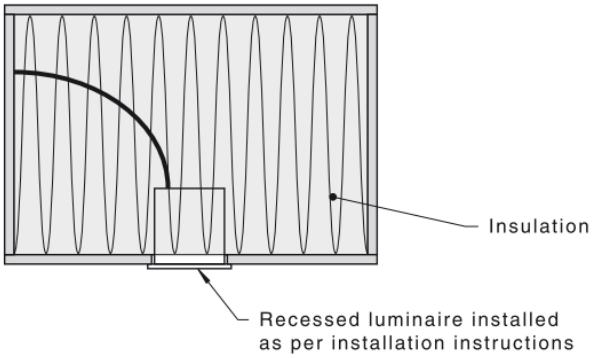
1. The test is run until temperatures have stabilized or 8 h have elapsed.

2. The dimensions of the test box shall be 900 mm wide × 900 mm long × 300 mm high.

3. The minimum horizontal distance from the side of the luminaire to the side of the test box shall be 75 mm and the minimum vertical distance from the top of the luminaire to the underside of the test box top shall be 75 mm.

4. Thermal insulation is then added to the test box to completely fill the test box. The insulation is pushed around the luminaire to form a close fit to the sides and top of the luminaire without compression.

5. mounting condition



IEC 60598_2_1C ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 60598-2-1 Australia NATIONAL DIFFERENCES	
Differences according to	AS.NZS 60598.2.1:2014+A1:2016 compared to IEC 60598-2-1(ed.1);am1
Attachment Form No.....	AS_NZS_IEC 60598-2-1C

6	**MARKING**		—
	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 In the warning, 'X' shall be replaced by 'A' or 'B' to denote Type A or Type B, as appropriate. The warning label shall be durable and the font size shall be a minimum of 5mm for letters and numbers and 5mm for symbols and shall be visible during lamp replacement. NOTE: Manufacturers should specify minimum requirements for the operations of their lamps, including spacing, enclosure design and temperature limitations.		N
7	**CONSTRUCTION**		—
	LED luminaires with G5 and G13 lampholders shall include a fuse to protect a fluorescent lamp that is inadvertently installed: Each fuse shall – (a) be of the 150V HRC type; (b) have a 0.5A max. quick-acting type rating; and (c) be used to protect a maximum of two lamps.		N
13	**ENDURANCE TESTS AND THERMAL TESTS**		—

IEC 60598_2_1C ATTACHMENT			
Clause	Requirement - Test	Result - Remark	Verdict
	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.		N
14	**RESISTANCE TO DUST AND MOISTURE**		—
	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.		N
APPENDIX A	**SAFETY REQUIREMENTS FOR DOUBLE-CAPPED LED LAMPS (Normative)**		**N**
APPENDIX B	**SAFETY REQUIREMENTS FOR T8 TO T5 LAMP CONVERTERS**		**N**

Attachment No. 3

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

TEST REPORT
IEC 62031
LED modules for general lighting – Safety specifications

4	**GENERAL REQUIREMENTS**		—
4.4	Integral modules tested assembled in the luminaire		P
4.5	Independent modules complies with requirements in IEC 60598-1		N

5	**GENERAL TEST REQUIREMENTS**		—
5.5	SELV-operated LED modules comply with Annex I of IEC 61347-2-13	(see Annex 1)	N
	General conditions for tests in Annex A	(see Annex A)	P

6	**CLASSIFICATION**		—
	Built-in module ..... :	Yes ☐ No ☒	—
	Independent module..... :	Yes ☐ No ☒	—
	Integral module ..... :	Yes ☒ No ☐	—
	For Integral module; Note to 1.2.1 in IEC 60598-1 applies.		—

7	**MARKING**	N
	Requirements not applicable to the evaluated product.	—

8	**TERMINALS**		—
	Screw terminals according section 14 of IEC 60598-1:		N
	Separately approved; component list	(see Annex 2)	N
	Part of the luminaire	(see Annex 3)	N
	Screwless terminals according section 15 of IEC 60598-1:		N
	Separately approved; component list	(see Annex 2)	N
	Part of the luminaire	(see Annex 4)	N
	Connectors according IEC 60838-2-2:		N
	Separately approved; component list	(see Annex 2)	N

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
9 (9)	**PROVISION FOR PROTECTIVE EARTHING**		N
	Requirements not applicable to the evaluated product.		—
10 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		N
	Requirements not applicable to the evaluated product.		—
11 (11)	**MOISTURE RESISTANCE AND INSULATION**		—
	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance with d.c. 500 V (MΩ):		P
	For basic insulation ≥ 2 MΩ ..... :	100MΩ	P
	For double or reinforced insulation ≥ 4 MΩ ..... :		N
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		N
12 (12)	**ELECTRIC STRENGTH**		—
	Immediately after clause 11 electric strength test for 1 min		P
	Basic insulation for SELV, test voltage 500 V		P
	Working voltage ≤ 50 V, test voltage 500 V		P
	Working voltage > 50 V ≤ 1000 V, test voltage (V):		N
	Basic insulation, 2U + 1000 V		N
	Supplementary insulation, 2U + 1000 V		N
	Double or reinforced insulation, 4U + 2000 V		N
	No flashover or breakdown		P
	Solid or thin sheet insulation for double or reinforced insulation fulfil the requirements in Annex N in IEC 61347-1		N
13 (14)	**FAULT CONDITIONS**		—
- (14)	When operated under fault conditions the controlgear:		N
	- does not emit flames or molten material		N
	- does not produce flammable gases		N
	- protection against accidental contact not impaired		N

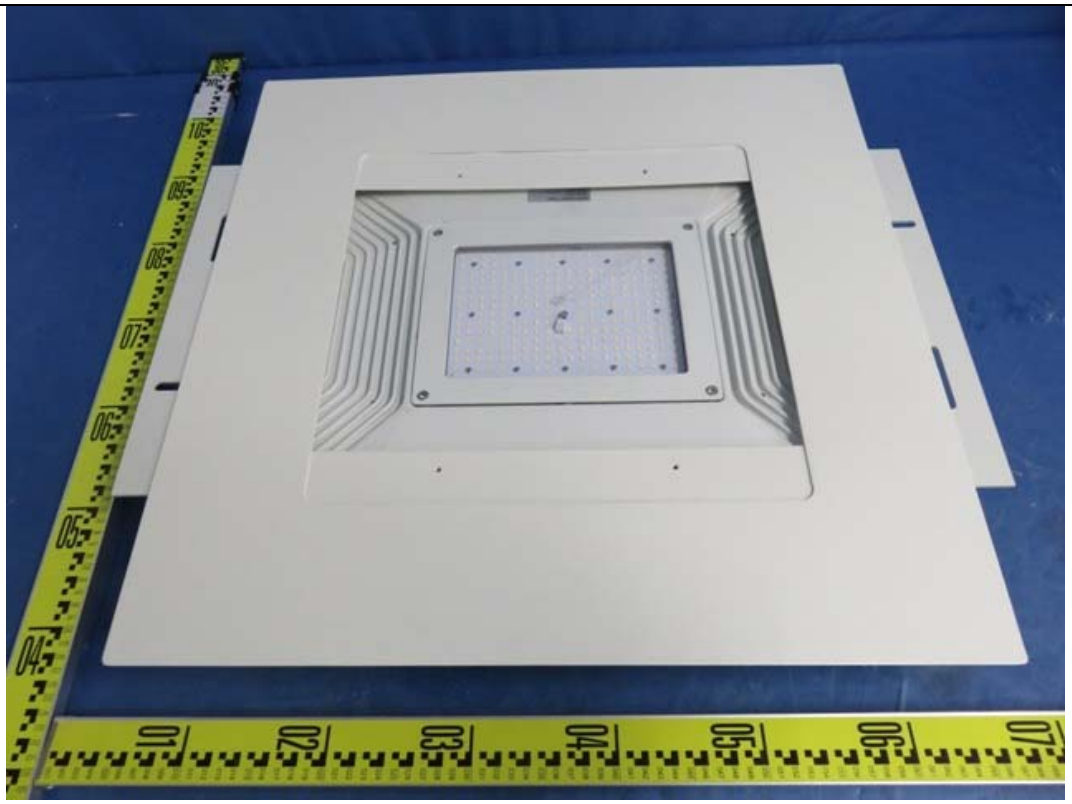
IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
	Thermally protected controlgear does not exceed the marked temperature value		N
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	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)	(see appended table)	N
	Creepage distances on printed boards less than specified in clause 16 in Part 1 provided with coating according to IEC 60664-3		N
- (14.2)	Short-circuit or interruption of semiconductor devices	(see appended table)	N
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	N
- (14.4)	Short-circuit across electrolytic capacitors	(see appended table)	N
- (14.5)	After the tests has been carried out on three samples:		N
	The insulation resistance ≥ 1 MΩ ..... :		N
	No flammable gases		N
	No accessible parts have become live		N
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		N
- (14.6)	Relevant fault condition tests with high-power supply		—
13.2	Module withstands overpower condition >15 min.		P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		N
	During the tests, tissue paper, spread below module, does not ignite		P

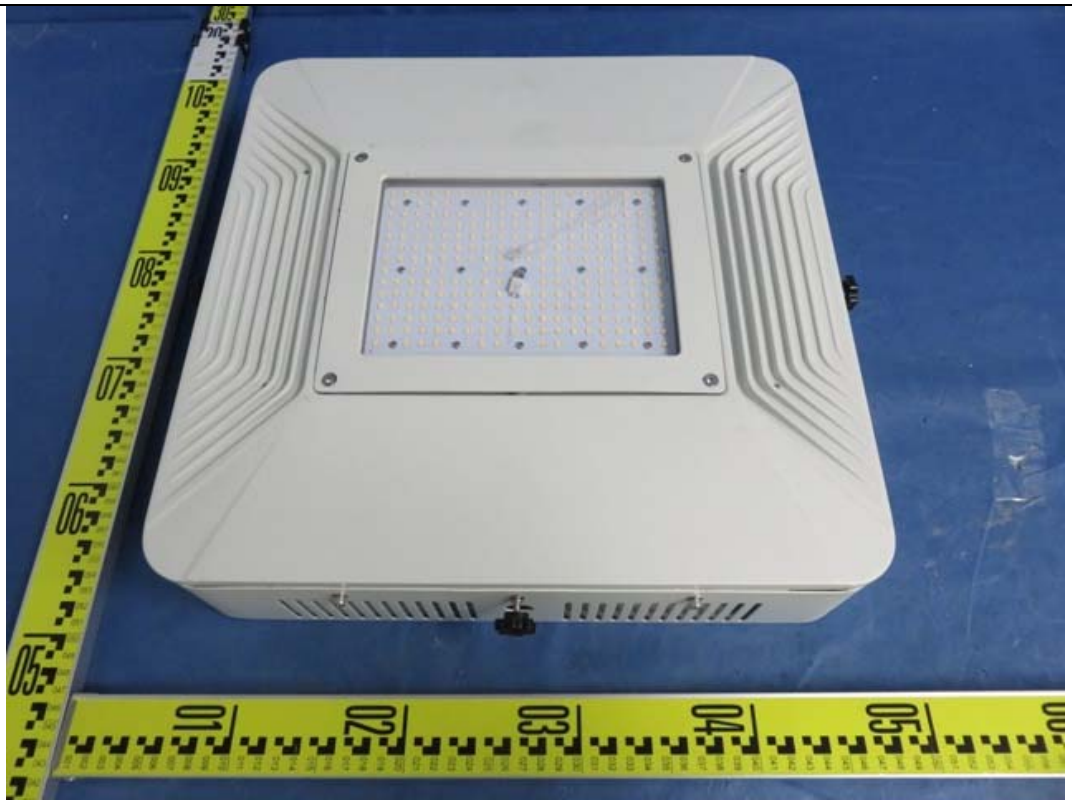
15	**CONSTRUCTION**		—
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P

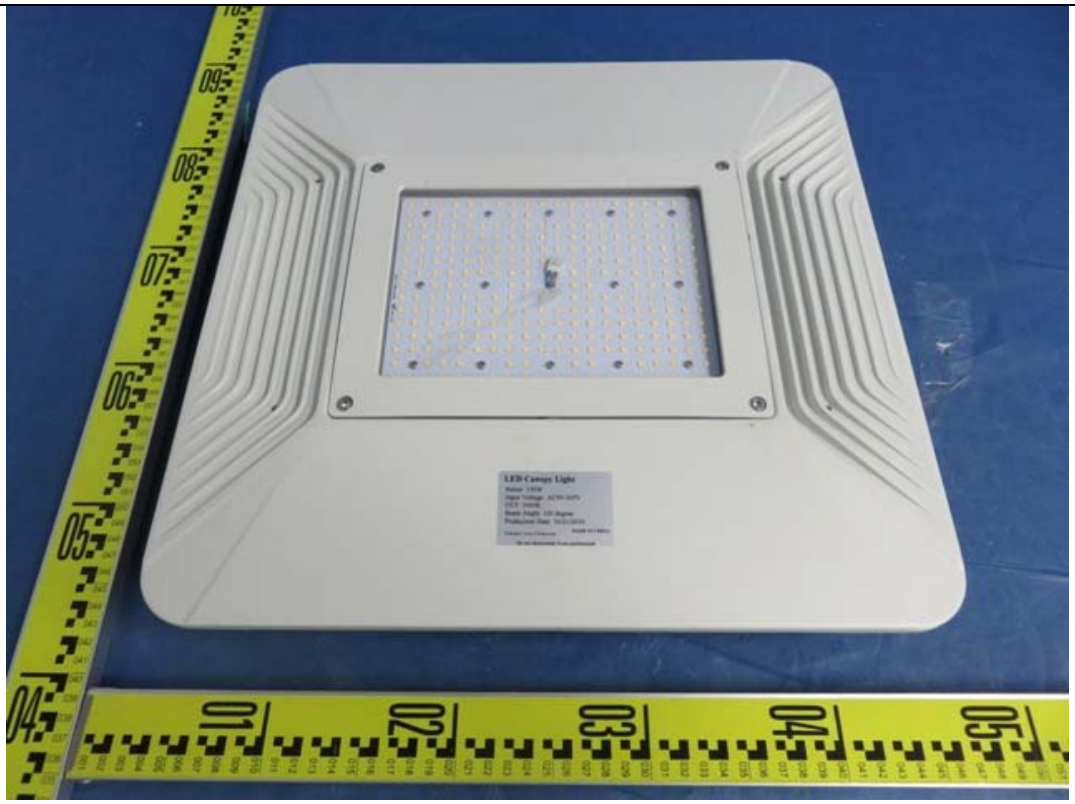
16	**CREEPAGE DISTANCES AND CLEARANCES**		—
	Creepage and distances and clearances in compliance with IEC 60598-1		P
	Working voltage (V) ..... :	MAX. 54VDC	—

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
	Voltage form	Sinusoidal ☐ Non-sinusoidal ☒	—
	PTI	< 600 ☒ ≥ 600 ☐	—
	Impulse withstand category (Normal category II) (Category III Annex U)	Category II ☒ Category III ☐	—
	Rated pulse voltage (kV) ..... :		—
	(1) Current-carrying parts of different polarity: cr (mm); cl (mm) :		N
	(2) Current-carrying parts and accessible parts: cr (mm); cl (mm) ..... :	No values are specified for working voltage below 60VDC as the test voltage 500V is considered sufficient.	N
	(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
	(6) Current-carrying parts and supporting surface: cr (mm); cl (mm) ..... :	No values are specified for working voltage below 60VDC as the test voltage 500V is considered sufficient.	N
17 (17)	**SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS**		—
	Screws, current-carrying parts and connections in compliance with IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1)		P
18 (18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		—
	Resistance to Heat, Fire and Tracking in compliance with IEC 61347-1 (clause numbers between parentheses refer to IEC 61347-1)		N
(18.1)	Ball-pressure test:		N
	- part tested; temperature (°C)..... :		N
(18.2)	Test of printed boards		N
	- part tested..... :		N
(18.3)	Glow-wire test (650°C):		N
	- part tested..... :		N
(18.4)	Needle flame test (10 s):		N
	- part tested..... :		N
(18.5)	Tracking test:		N

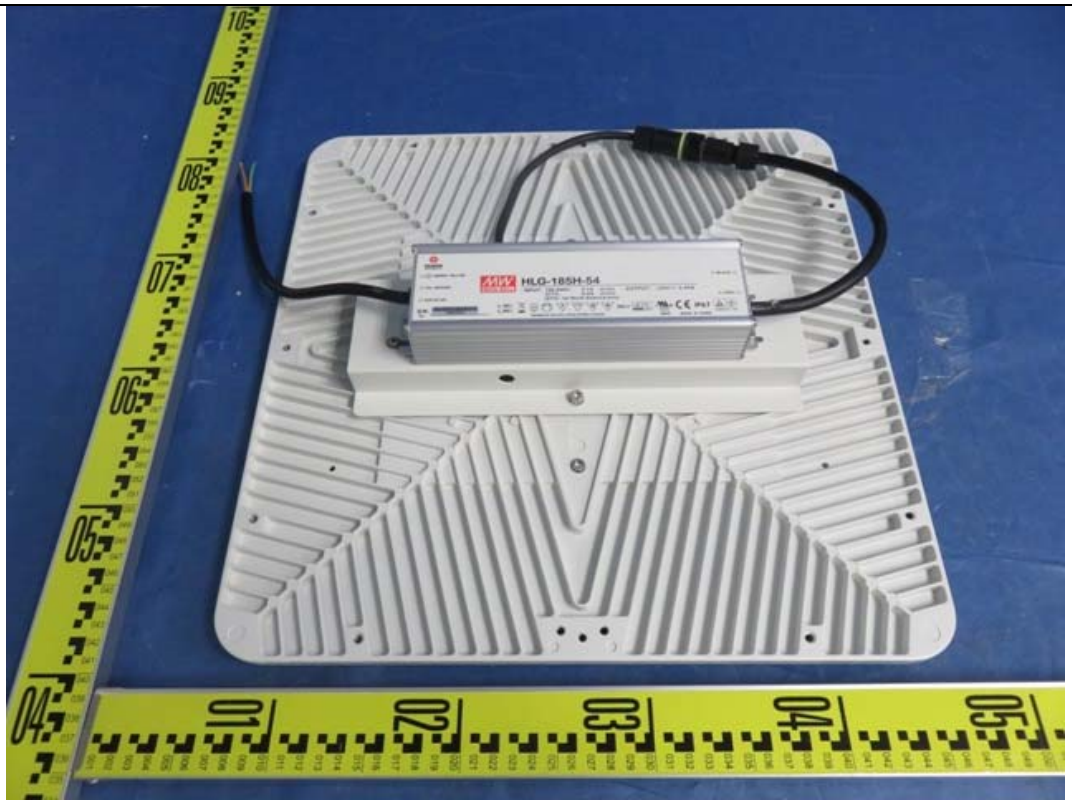
IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
	- part tested..... :		N
19 (19)	**RESISTANCE TO CORROSION**		—
	Rust protection:		N
	- test according 4.18.1 of IEC 60598-1		N
	- adequate varnish on the outer surface		N
20	**INFORMATION FOR LUMINAIRE DESIGN**		N
	Information in Annex D		—
21	**HEAT MANAGEMENT**		—
21.1	General		N
	Exchangeability is safeguarded by cap or base		N
21.2	Heat-conducting foil and paste		N
	Heat-conducting foil delivered with the module if necessary		N
21.4	Construction		N
	Electrical connection and mechanical holding are separate		N
A	**ANNEX A - TESTS**		—
	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**		—
	Requirement not applicable to the evaluated product.		N







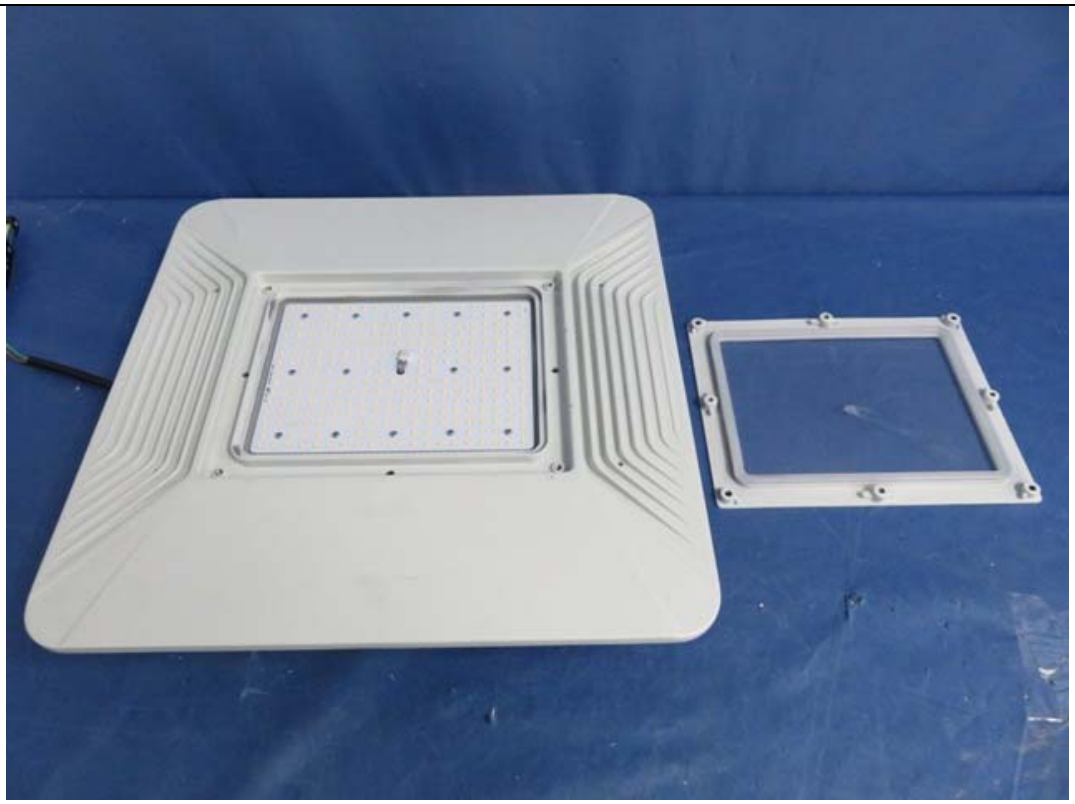
Front view



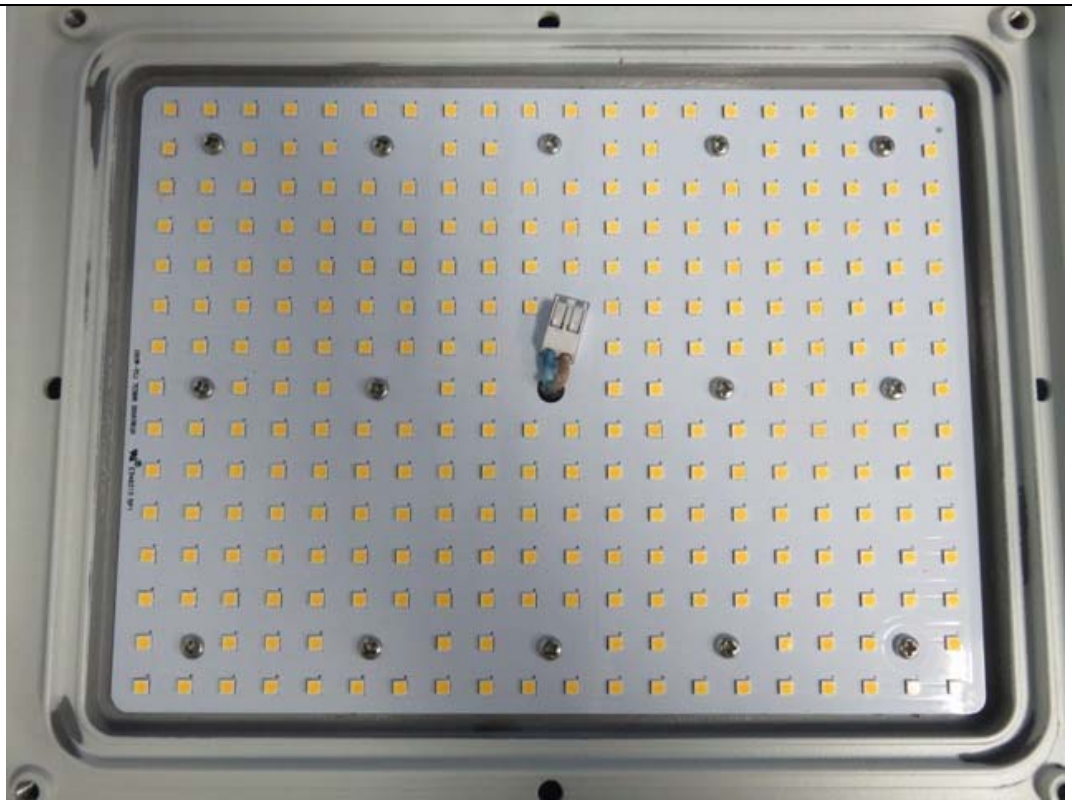
Rear view

LED Driver

Internal view



Internal view



LED module view

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