TEST REPORT
IEC 60598-2-22
Luminaires
Part 2: Particular requirements
Section 22: Luminaires for emergency lighting

Report Number.....:	LCS220105115BS
Date of issue.....:	May 27, 2022
Total number of pages.....:	189 pages
Name of Testing Laboratory preparing the Report.....:	**Shenzhen Southern LCS Compliance Testing Laboratory Ltd.**
Applicant's name.....:	Deshun Smart Technology Co., Ltd.
Address.....:	No. 39, Dongqi Highway, Zhangjiagang City, Jiangsu, China
Test specification:	
Standard.....:	IEC 60598-2-22:2014, AMD1:2017 used in conjunction with IEC 60598-1:2014, AMD1:2017
Test procedure.....:	Australia Safety
Non-standard test method.....:	N/A
Test Report Form No.....:	IEC60598_2_22G
Test Report Form(s) Originator.....:	Intertek Semko AB
Master TRF.....:	Dated 2018-09-14

General disclaimer:

The test results presented in this report relate only to the object tested.

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Test item description.....:	LED exit emergency light
Trade Mark.....:	--
Manufacturer.....:	As the same applicant
Address.....:	As the same applicant address
Model/Type reference.....:	See model list on page 5
Ratings.....:	See model list on page 5

☒ **Testing Laboratory:**		
Testing location/ address.....:	Shenzhen Southern LCS Compliance Testing Laboratory Ltd. 101-201, No.39 Building, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, China	
Tested by.....:	Yeoh Zhang (Engineer)	
Check by.....:	Torres He (Director)	
Approved by.....:	Jesse Liu (Manager)	

List of Attachments (including a total number of pages in each attachment):

Attachment No. 1: Australian and New Zealand deviation of AS/NZS 60598.1:2017+A1:2017.
Attachment No. 2: Australian and New Zealand deviation of AS 60598.2.22:2019.
Attachment No. 3: Integral LED module of IEC 62031:2018
Attachment No. 4: Photobiological hazards of IEC TR 62778:2014.
Attachment No. 5: Integral emergency driver of IEC 61347-2-7:2011+A1:2017.
Attachment No. 6: Integral LED driver of IEC 61347-2-13:2014+A1:2016.
Attachment No. 7: Australian and New Zealand deviation of AS/NZS 61347.1:2016+A1:2018.
Attachment No. 8: Australian and New Zealand deviation of AS 61347.2.7:2019.
Attachment No. 9: Australian and New Zealand deviation of AS 61347.2.13:2018.
Attachment No. 10: Australian and New Zealand deviation of AS/NZS 2293.3:2018+A1:2021.
Attachment No. 11: Photo documentation.

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
IEC 60598-2-22: 2014+A1:2017 IEC 60598-1:2014+A1:2017 IEC 62031:2018 IEC TR 62778:2014 IEC 61347-2-7: 2011+A1:2017 IEC 61347-2-13:2014+A1:2016 IEC 61347-1: 2015+A1: 2017	Shenzhen Southern LCS Compliance Testing Laboratory Ltd. 101-201, No.39 Building, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, China

Summary of compliance with National Differences:

List of countries addressed

☒ The product fulfils the requirements of New Zealand and Australia differences.
AS 60598.2.22:2019; AS/NZS 60598.1:2017+A1:2017; AS/NZS 61347.1:2016+A1:2018;
AS 61347.2.7:2019; AS 61347.2.13:2018; AS/NZS 2293.3:2018+A1:2021

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Label of luminaires:

For automatic test function model:

LED emergency light | X | 0 | F | 180 |
Model No.: DS-ES-04S
220-240V, 50/60Hz, Emergency power:1.5W,

ta.40℃, C0:D0.32 C90:D8

Replaceable battery: IFR 18650-1.6Ah 6.4V 1600mAh
Deshun Smart Technology Co., Ltd.
No. 39, Dongqi Highway, Zhangjiagang City, Jiangsu, China
Certificate No.:XXXXXXXX

For manual test function:

LED emergency light | X | 1 | A | 180 |
Model No.: DS-ES-04M
220-240V, 50/60Hz, Emergency power:1.5W,

ta.40℃, C0:D0.32 C90:D8

Replaceable battery: IFR 18650-1.6Ah 6.4V 1600mAh
Deshun Smart Technology Co., Ltd.
No. 39, Dongqi Highway, Zhangjiagang City, Jiangsu, China
Certificate No.:XXXXXXXX

WARNING:
ALL MAINTENANCE, SUCH AS BATTERY CHANGE ON THIS LUMINAIRE, TO BE PERFORMED BY QUALIFIED PERSONNEL ONLY.
DE-ENERGISE ALL SUPPLIES BEFORE MAINTENANCE.

Label of battery:

Li-ion Battery: IFR 18650-1.6Ah
6.4V 1600mAh
Temperature Classification: 0℃~55℃
Charge regime: Constant current
Manufacture Date: YY-MM-DD
Battery rated to operate for 3 hours, replace battery if tested duration is less than 3 hours.

Remarks:

Height of RCM symbol at least 3mm, height of other symbol at least 5mm, height of other letters and numerals at least 2mm.

Test item particulars.....	
Classification of installation and use.....	Luminaires for emergency lighting
Supply Connection.....	Terminal block
Protection Class.....	Class II
Degree of Protection.....	IP20
Possible test case verdicts:	
- test case does not apply to the test object.....	N/A
- test object does meet the requirement.....	P (Pass)
- test object does not meet the requirement.....	F (Fail)
Testing.....	
Date of receipt of test item.....	2022-04-04
Date (s) of performance of tests.....	2022-04-04 ~ 2022-05-25

General remarks:

This report shall not be reproduced except in full without the written approval of the testing laboratory.

The test results presented in this report relate only to the item tested.

"(See Enclosure #)" refers to additional information appended to the report.

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

Clause numbers between brackets refer to clauses in IEC 60598-1.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

Modified Information

Version	Report No.	Revision Date	Summary
V1.0	LCS220105115BS	/	Original Version

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....	☐ **Yes** ☒ **Not applicable**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies)..... Same as manufacturer

General product information:

1.All models are equipped with the same integral SELV emergency control gear and battery,except the appearance. The suffix with “M” represents manual test function, with ”S” represent automatic test function. The manual test function is maintained, the automatic test function is the non-maintained.

2.Unless otherwise specified, the model DS-ES-04M was chosen as representative model to perform all test.DS-ES-01M, DS-ES-02M, DS-ES-03M, DS-ES-05M, DS-ES-06M was test in difference tests.

Model list:

Model No.	Rating	Battery
DS-ES-01M	220-240V~, 50/60Hz, ta.40℃, Emergency power:1.5W, IP20	IFR 18650-1.6Ah 6.4V 1600mAh
DS-ES-02M	220-240V~, 50/60Hz, ta.40℃, Emergency power:1.5W, IP20	IFR 18650-1.6Ah 6.4V 1600mAh
DS-ES-03M	220-240V~, 50/60Hz, ta.40℃, Emergency power:1.5W, IP20	IFR 18650-1.6Ah 6.4V 1600mAh
DS-ES-04M	220-240V~, 50/60Hz, ta.40℃, Emergency power:1.5W, IP20	IFR 18650-1.6Ah 6.4V 1600mAh
DS-ES-05M	220-240V~, 50/60Hz, ta.40℃, Emergency power:1.5W, IP20	IFR 18650-1.6Ah 6.4V 1600mAh
DS-ES-06M	220-240V~, 50/60Hz, ta.40℃, Emergency power:1.5W, IP20	IFR 18650-1.6Ah 6.4V 1600mAh
DS-ES-01S	220-240V~, 50/60Hz, ta.40℃, Emergency power:1.5W, IP20	IFR 18650-1.6Ah 6.4V 1600mAh
DS-ES-02S	220-240V~, 50/60Hz, ta.40℃, Emergency power:1.5W, IP20	IFR 18650-1.6Ah 6.4V 1600mAh
DS-ES-03S	220-240V~, 50/60Hz, ta.40℃, Emergency power:1.5W, IP20	IFR 18650-1.6Ah 6.4V 1600mAh
DS-ES-04S	220-240V~, 50/60Hz, ta.40℃, Emergency power:1.5W, IP20	IFR 18650-1.6Ah 6.4V 1600mAh
DS-ES-05S	220-240V~, 50/60Hz, ta.40℃, Emergency power:1.5W, IP20	IFR 18650-1.6Ah 6.4V 1600mAh
DS-ES-06S	220-240V~, 50/60Hz, ta.40℃, Emergency power:1.5W, IP20	IFR 18650-1.6Ah 6.4V 1600mAh

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
22.4 (0)	**GENERAL TEST REQUIREMENTS**		P
22.4 (0.3)	More sections applicable.....:	Yes☒ No☐ Section/s:	—
22.4 (0.5)	Components	(see Annex 1)	—
22.4 (0.7)	**Information for luminaire design in light sources standards**		—
22.4 (0.7.2)	Light source safety standard .....:	IEC 62031 IEC TR 62778	—
	Luminaire design in the light source safety standard		P
22.4 (-)	Part provide normal lighting, test according relevant part of IEC 60598-2 .....:		N/A
22.4 (-)	Adjacent part fulfils relevant part of this part 2		P
22.4 (-)	Self-contained portable emergency luminaires, requirements according Annex E	(see Annex E)	N/A
22.5 (2)	**CLASSIFICATION**		P
22.5 (2.2)	Type of protection .....:	Class II	P
22.5 (2.3)	Degree of protection.....:	IP20	P
22.5 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces.....:	Yes☒ No☐	—
22.5 (2.5)	Luminaire for normal use .....:	Yes☒ No☐	—
	Luminaire for rough service .....:	Yes☐ No☒	—
22.5 (-)	Classified as luminaire suitable for direct mounting on normally flammable surfaces		P
22.5 (-)	Classification code according Annex B	(see Annex B)	P
22.6 (3)	**MARKING**		P
22.6 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
22.6 (3.3)	Additional information		P
	Language of instructions	English	P
22.6 (3.3.1)	Combination luminaires		N/A
22.6 (3.3.2)	Nominal frequency in Hz	50/60Hz	P
22.6 (3.3.3)	Operating temperature		N/A
22.6 (3.3.4)	Symbol or warning notice		N/A

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
22.6 (3.3.5)	Wiring diagram	See user manual	P
22.6 (3.3.6)	Special conditions		N/A
22.6 (3.3.7)	Metal halide lamp luminaire – warning		N/A
22.6 (3.3.8)	Limitation for semi-luminaires		N/A
22.6 (3.3.9)	Power factor and supply current		N/A
22.6 (3.3.10)	Suitability for use indoors		N/A
22.6 (3.3.11)	Luminaires with remote control		N/A
22.6 (3.3.12)	Clip-mounted luminaire – warning		N/A
22.6 (3.3.13)	Specifications of protective shields		N/A
22.6 (3.3.14)	Symbol for nature of supply	~	P
22.6 (3.3.15)	Rated current of socket outlet		N/A
22.6 (3.3.16)	Rough service luminaire		N/A
22.6 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments		N/A
22.6 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A
22.6 (3.3.19)	Protective conductor current in instruction if applicable		N/A
22.6 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
22.6 (3.3.21)	Non replaceable and non-user replaceable light sources information provided	Non-user replaceable	P
	Cautionary symbol		N/A
22.6 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
22.6 (3.4)	Test with water	15s	P
	Test with hexane	15s	P
	Legible after test	Label is legible	P
	Label attached	Label no curling	P
22.6.1 (-)	Supply voltage	220-240VAC	P

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
22.6.2 (-)	Classification according to annex B		P
22.6.3 (-)	Correct replacement lamp	Non-user replaceable LEDs	N/A
22.6.4 (-)	Range of ambient temperatures	ta: 40ºC	P
22.6.5 (-)	Fuse ratings and/or indicator lamps	Non-replaceable fuse and Non-replaceable indicator lamps	N/A
22.6.6 (-)	Facilities to simulate normal supply failure		P
22.6.7 (-)	Marked with correct battery replacement	See user manual	P
	Non-replaceable batteries		N/A
22.6.8 (-)	Battery marked with date of manufacture		P
	Space provided on battery label		P
22.6.9 (-)	Correct lamp replacement for combined emergency luminaires		N/A
	Green dot with min 5 mm diameter		N/A
	Instruction leaflet 22.6.10 – 22.6.12 and 22.6.14 – 22.6.16		N/A
22.6.10 (-)	Replacement of battery or luminaire	See user manual	P
22.6.11 (-)	Details of test facilities	For the manual test function	P
22.6.12 (-)	Details of connection leads		N/A
22.6.14 (-)	Details of device which changes the mode of operation		P
22.6.15 (-)	Photometric data available according 22.17		P
22.6.16 (-)	Any normal preparation procedure		P
22.6.17 (-)	Marking in 22.6.1, 22.6.2, 22.6.7 and 22.6.20 visible on installed luminaire		P
	Marking in 22.6.5, 22.6.7 and 22.6.9 visible during maintenance		P
22.6.18 (-)	Provided with warning if intended for external plug and socket connections		N/A
22.6.19 (-)	Instruction leaflet specifies if lamp and/or battery is/are non-replaceable		N/A
22.6.20 (-)	Marking if luminaire mounted on lighting track systems		N/A
	Photometric data in instruction leaflet		N/A

22.7(4)	**CONSTRUCTION**		P
22.7 (4.2)	Components replaceable without difficulty		P

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
22.7 (4.3)	Wireways smooth and free from sharp edges		P
22.7 (4.4)	**Lampholders**		N/A
22.7 (4.4.1)	Integral lampholder		N/A
22.7 (4.4.2)	Wiring connection		N/A
22.7 (4.4.3)	Lampholder for end-to-end mounting		N/A
22.7 (4.4.4)	Positioning		N/A
	- pressure test (N) ..... :	--	—
	After test the lampholder comply with relevant standard sheets and show no damage		N/A
	After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation		N/A
	- bending test (N) .....:	--	—
	After test the lampholder have not moved from its position and show no permanent deformation		N/A
22.7 (4.4.5)	Peak pulse voltage		N/A
22.7 (4.4.6)	Centre contact		N/A
22.7 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A
22.7 (4.4.8)	Lamp connectors		N/A
22.7 (4.4.9)	Caps and bases correctly used		N/A
22.7 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N/A
22.7 (4.5)	**Starter holders**		N/A
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
22.7 (4.6)	**Terminal blocks**		N/A
	Tails		N/A
	Unsecured blocks		N/A
22.7 (4.7)	**Terminals and supply connections**		P
22.7 (4.7.1)	Contact to metal parts		P
22.7 (4.7.2)	Test 8 mm live conductor		P
	Test 8 mm earth conductor		N/A
22.7 (4.7.3)	Terminals for supply conductors		P
22.7 (4.7.3.1)	Welded method and material		N/A

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
	- stranded or solid conductor		N/A
	- spot welding		N/A
	- welding between wires		N/A
	- Type Z attachment		N/A
	- mechanical test according to 15.6.2		N/A
	- electrical test according to 15.6.3		N/A
	- heat test according to 15.6.3.2.3 and 15.6.3.2.4		N/A
22.7 (4.7.4)	Terminals other than supply connection		N/A
22.7 (4.7.5)	Heat-resistant wiring/sleeves		N/A
22.7 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A
22.7 (4.8)	**Switches**		P
	- adequate rating		P
	- adequate fixing		P
	- polarized supply		N/A
	- compliance with IEC 61058-1 for electronic switches	Confirmed for10,000 operating cycles(for test switch)	P
22.7 (4.9)	**Insulating lining and sleeves**		N/A
22.7 (4.9.1)	Retainment		N/A
	Method of fixing.....:	--	N/A
22.7 (4.9.2)	Insulated linings and sleeves:		N/A
	Resistant to a temperature > 20 °C to the wire temperature or		N/A
	a) & c) Insulation resistance and electric strength		N/A
	b) Ageing test. Temperature (°C).....:	--	N/A
22.7 (4.10)	**Double or reinforced insulation**		N/A
22.7 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		N/A
	Safe installation fixed luminaires		N/A
	Capacitors and switches		N/A
	Interference suppression capacitors according to IEC 60384-14		N/A
22.7 (4.10.2)	Assembly gaps:		N/A

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
	- not coincidental		N/A
	- no straight access with test probe		N/A
22.7 (4.10.3)	Retainment of insulation:		N/A
	- fixed		N/A
	- unable to be replaced; luminaire inoperative		N/A
	- sleeves retained in position		N/A
	- lining in lampholder		N/A
22.7 (4.10.4)	Protective impedance device		N/A
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor		N/A
	Y1 or Y2 capacitors comply with IEC 60384-14		N/A
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A
22.7 (4.11)	**Electrical connections and current-carrying parts**		P
22.7 (4.11.1)	Contact pressure		N/A
22.7 (4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread- cutting screws		N/A
22.7 (4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
22.7 (4.11.4)	Material of current-carrying parts		P
22.7 (4.11.5)	No contact to wood or mounting surface		P
22.7 (4.11.6)	Electro-mechanical contact systems		N/A
22.7 (4.12)	**Screws and connections (mechanical) and glands**		P
22.7 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N/A

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
	Torque test: torque (Nm); part.....:	Fixed enclosure: 1.2Nm	P
	Torque test: torque (Nm); part.....:	Fixed driver: 0.6Nm	P
	Torque test: torque (Nm); part.....:		S
22.7 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
22.7 (4.12.4)	Locked connections:		N/A
	- fixed arms; torque (Nm)..... :	--	N/A
	- lampholder; torque (Nm).....:	--	N/A
	- push-button switches; torque 0,8 Nm..... :	--	N/A
22.7 (4.12.5)	Screwed glands; force (Nm)..... :	--	N/A
22.7 (4.13)	**Mechanical strength**		P
22.7 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm)..... :	--	N/A
	- other parts; energy (Nm).....:	For all parts: 0.35Nm	P
	1) live parts		P
	2) linings		N/A
	3) protection		P
	4) covers		P
22.7 (4.13.3)	Straight test finger		P
22.7 (4.13.4)	Rough service luminaires		N/A
	- IP54 or higher		N/A
	a) fixed		N/A
	b) hand-held		N/A
	c) delivered with a stand		N/A
	d) for temporary installations and suitable for mounting on a stand		N/A
22.7 (4.13.6)	Tumbling barrel		N/A
22.7 (4.14)	**Suspensions, fixings and means of adjusting**		P
22.7 (4.14.1)	Mechanical load:		P

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
	A) four times the weight		P
	B) torque 2,5 Nm		N/A
	C) bracket arm; bending moment (Nm)..... :	--	N/A
	D) load track- mounted luminaires		N/A
	E) clip-mounted luminaires, glass-shelve. Thickness (mm) ..... :	--	N/A
	Metal rod. diameter (mm) .....:	--	N/A
	Fixed luminaire or independent control gear without fixing devices		N/A
22.7 (4.14.2)	Load to flexible cables		N/A
	Mass (kg) .....:	--	—
	Stress in conductors (N/mm²) .....:	--	N/A
	Mass (kg) of semi-luminaire .....:	--	N/A
	Bending moment (Nm) of semi-luminaire .....:	--	N/A
22.7 (4.14.3)	Adjusting devices:		N/A
	- flexing test; number of cycles.....:	--	N/A
	- strands broken.....:	--	N/A
	- electric strength test afterwards		N/A
22.7 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
22.7 (4.14.5)	Guide pulleys		N/A
22.7 (4.14.6)	Strain on socket-outlets		N/A
22.7 (4.15)	**Flammable materials**		N/A
	- glow- wire test 650°C.....:	See Test Table 22.16 (13.3.2)	N/A
	- spacing ≥30 mm		N/A
	- screen withstanding test of 13.3.1		N/A
	- screen dimensions		N/A
	- no fiercely burning material		N/A
	- thermal protection		N/A
	- electronic circuits exempted		N/A

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
22.7 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		N/A
	a) construction		N/A
	b) temperature sensing control		N/A
	c) surface temperature		N/A
22.7 (4.16)	**Luminaires for mounting on normally flammable surfaces**		N/A
	No lamp control gear.....:	(compliance with Section 12)	N/A
22.7 (4.16.1)	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
22.7 (4.16.2)	Thermal protection:		N/A
	- in lamp control gear		N/A
	- external		N/A
	- fixed position		N/A
	- temperature marked lamp control gear		N/A
22.7 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N/A
22.7 (4.17)	**Drain holes**		N/A
	Clearance at least 5 mm		N/A
22.7 (4.18)	**Resistance to corrosion**		N/A
22.7 (4.18.1)	- rust- resistance		N/A
22.7 (4.18.2)	- season cracking in copper		N/A
22.7 (4.18.3)	- corrosion of aluminium		N/A
22.7 (4.19)	Ignitors compatible with ballast		N/A
22.7 (4.20)	Rough service vibration		N/A
22.7 (4.21)	**Protective shield**		N/A
22.7 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A
	Shield of glass if tungsten halogen lamps		N/A
22.7 (4.21.2)	Particles from a shattering lamp not impair safety		N/A

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
22.7 (4.21.3)	No direct path		N/A
22.7 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment.....:	See Test Table 22.16 (13.3.2)	N/A
22.7 (4.22)	Attachments to lamps not cause overheating or damage		N/A
22.7 (4.23)	Semi-luminaires comply Class II		N/A
22.7 (4.24)	**Photobiological hazards**		P
22.7 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N/A
22.7 (4.24.2)	Retinal blue light hazard		P
	Class of risk group assessed according to IEC/TR 62778 .....:	RG0	—
	Luminaires with E_{thr} :		N/A
	a) Fixed luminaires		N/A
	- distance x m, borderline between RG1 and RG2... :		N/A
	- marking and instruction according 3.2.23		N/A
	b) Portable and handheld luminaires		N/A
	- marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778		N/A
	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/A
22.7 (4.25)	**Mechanical hazard**		P
	No sharp point or edges		P
22.7 (4.26)	**Short-circuit protection**		N/A
22.7 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N/A
22.7 (4.26.2)	Short-circuit test with test chain according 4.26.3		N/A
	Test chain not melt through		N/A
	Test sample not exceed values of Table 12.1 and 12.2		N/A
22.7 (4.27)	**Terminal blocks with integrated screwless earthing contacts**		N/A
	Test according Annex V		N/A

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
	Pull test of terminal fixing (20 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Pull test of mechanical connection (50 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Voltage drop test, resistance < 0,05 Ω		N/A
22.7 (4.28)	**Fixing of thermal sensing control**		N/A
	Not plug-in or easily replaceable type		N/A
	Reliably kept in position		N/A
	No adhesive fixing if UV radiations from a lamp can degrade the fixing		N/A
	Not outside the luminaire enclosure		N/A
	Test of adhesive fixing:		N/A
	Max. temperature on adhesive material (°C) .....:		—
	100 cycles between t min and t max		N/A
	Temperature sensing control still in position		N/A
22.7 (4.29)	**Luminaires with non-replaceable light source**		N/A
	Not possible to replace light source		N/A
	Live part not accessible after parts have been opened by hand or tools		N/A
22.7 (4.30)	**Luminaires with non-user replaceable light source**		P
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		N/A
	Minimum two fixing means		P
22.7 (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		P
22.7 (4.31.1)	SELV circuits		P
	Used SELV source		P
	Voltage ≤ ELV		P
	Insulating of SELV circuits from LV supply		P

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
	Insulating of SELV circuits from other non SELV circuits		N/A
	Insulating of SELV circuits from FELV		N/A
	Insulating of SELV circuits from other SELV circuits		N/A
	SELV circuits insulated from accessible parts according Table X.1		P
	Plugs not able to enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Plugs and socket-outlets does not have protective conductor contact		N/A
22.7 (4.31.2)	FELV circuits		N/A
	Used FELV source		N/A
	Voltage ≤ ELV		N/A
	Insulating of FELV circuits from LV supply		N/A
	FELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Socket-outlets does not have protective conductor contact		N/A
22.7 (4.31.3)	Other circuits		N/A
	Other circuits insulated from accessible parts according Table X.1		N/A
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		N/A
	- conductive parts are connected together		N/A
	- test according 7.2.3		N/A
	- conductive part not cause an electric shock in case of an insulation fault		N/A
	- equipotential bonding in master/slave applications		N/A
	- master luminaire provided with terminal for accessible conductive parts of slave luminaires		N/A

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
	- slave luminaire constructed as class I		N/A
22.7 (4.32)	**Overvoltage protective devices**		N/A
	Comply with IEC 61643-11		N/A
	External to controlgear and connected to earth:		N/A
	- only in fixed luminaires		N/A
	- only connected to protective earth		N/A
22.7 (-)	Luminaire with automatic testing system complies with IEC 62034		N/A
	Specific items according IEC 61347-2-7 Annex K		N/A
22.7.1 (-)	No glow starters in circuit in start of or during the emergency mode		N/A
22.7.2 (-)	Lamp control gears comply with relevant part 2 of IEC 61347		P
22.7.3 (-)	Protective device disconnect luminaire in case of failure		P
22.7.4 (-)	Impact test min. 0,35 Nm		P
22.7.5 (-)	Circuit separation (self-contained lum.)		P
22.7.6 (-)	Circuit separation (centrally supplied lum.)		N/A
22.7.7 (-)	Charging device		P
	Indicator lamp and colour	Green	P
22.7.8 (-)	Battery meet requirements in Annex A	(see Annex A)	P
	Battery designed to provide duration for at least four years		P
	Battery only for emergency function		P
22.7.10 (-)	No switch in self-contained emergency luminaire between battery and emergency lighting lamps		P
	No switch in self-contained and central supplied emergency luminaire isolating emergency circuits from mains supply		P
	Installation according IEC 60364-5-56		P
22.7.11 (-)	Failure of lamp(s) not impair operation of the battery		P
22.7.12 (-)	Batteries in self-contained emergency luminaire comply with cl. 23 of IEC 61347-2-7 if applicable		P
22.7.13 (-)	No influence in emergency mode in self-contained emergency luminaire by short-circuit, contact to earth or interruption in normal supply wiring		P

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
22.7.14 (-)	Self-contained emergency luminaire with remote inhibiting and/or rest mode meet requirements of clause 25 of IEC 61347-2-7		N/A
22.7.19 (-)	Lamp voltage in self-contained emergency luminaire with tungsten filament lamps not exceed 1,05 rated voltage		N/A
22.7.20 (-)	Battery in self-contained emergency luminaire according manufacturers specification and Annex A		P
22.7.21 (-)	Batteries and chargers within self-contained emergency luminaire or in remote box		N/A
22.7.22 (-)	Remote box in self-contained emergency luminaire comply with same requirements as for the luminaire		N/A
22.7.23 (-)	Locking system for emergency luminaire on track system used for display lighting requires aid of tool		N/A
22.8 (11)	**CREEPAGE DISTANCES AND CLEARANCES**		P
22.8 (11.2.1)	Impulse withstand category (Normal category II)	Category II ☒ Category III ☐	—
	Category III according Annex U		N/A
	Protected against pollution, reduced creepage and clearance according Annex P of IEC 61347-1		N/A
22.8 (11.2.2)	Creepage distances for frequency up to 30 kHz	See Test Table 22.8 (11.2) I	P
	Creepage distances for frequency over 30 kHz:		N/A
	- Controlgear marked with $\hat{U}_{OUT}$ and f_{UOUT} according IEC 61347-1, clause 7.1, item w	See Test Table 22.8 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 22.8 (11.2) II	N/A
22.8 (11.2.3)	Clearances for frequency up to 30 kHz	See Test Table 22.8 (11.2) I	P
	Clearances distances for frequency over 30 kHz:		N/A
	- Controlgear marked with U_P	See Test Table 22.8 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 22.8 (11.2) II	N/A
22.9 (7)	**PROVISION FOR EARTHING**		N/A
22.9 (7.2.1 + 7.2.3)	Accessible metal parts		N/A

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
	Metal parts in contact with supporting surface		N/A
	Resistance < 0,5 Ω.....:		N/A
	Self-tapping screws used		N/A
	Thread-forming screws		N/A
	Thread-forming screw used in a grove		N/A
	Earth makes contact first		N/A
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
	Protective earthing of the luminaire not via built-in control gear		N/A
22.9 (7.2.2 + 7.2.3)	Earth continuity in joints, etc.		N/A
22.9 (7.2.4)	Locking of clamping means		N/A
	Compliance with 4.7.3		N/A
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
22.9 (7.2.5)	Earth terminal integral part of connector socket		N/A
22.9 (7.2.6)	Earth terminal adjacent to mains terminals		N/A
22.9 (7.2.7)	Electrolytic corrosion of the earth terminal		N/A
22.9 (7.2.8)	Material of earth terminal		N/A
	Contact surface bare metal		N/A
22.9 (7.2.10)	Class II luminaire for looping-in		N/A
	Double or reinforced insulation to functional earth		N/A
22.9 (7.2.11)	Earthing core coloured green-yellow		N/A
	Length of earth conductor		N/A

22.10 (14)	**SCREW TERMINALS**		N/A
	Separately approved; component list	(see Annex 1)	N/A
	Part of the luminaire	(see Annex 3)	N/A

22.10 (15)	**SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS**		P
	Separately approved; component list.....:	(see Annex 1)	P
	Part of the luminaire.....:	(see Annex 4)	N/A

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict

22.11 (5)	**EXTERNAL AND INTERNAL WIRING**		P
22.11 (5.2)	**Supply connection and external wiring**		P
22.11 (5.2.1)	Means of connection.....:	Terminal block	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/A
22.11 (5.2.2)	Type of cable.....:		N/A
	Nominal cross-sectional area (mm²)..... :		N/A
	Cables equal to IEC 60227 or IEC 60245		N/A
22.11 (5.2.3)	Type of attachment, X, Y or Z		N/A
22.11 (5.2.5)	Type Z not connected to screws		N/A
22.11 (5.2.6)	Cable entries:		N/A
	- suitable for introduction		N/A
	- adequate degree of protection		N/A
22.11 (5.2.7)	Cable entries through rigid material have rounded edges		N/A
22.11 (5.2.8)	Insulating bushings:		N/A
	- suitably fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- tubes or guards made of insulating material		N/A
22.11 (5.2.9)	Locking of screwed bushings		N/A
22.11 (5.2.10)	Cord anchorage:		N/A
	- covering protected from abrasion		N/A
	- clear how to be effective		N/A
	- no mechanical or thermal stress		N/A
	- no tying of cables into knots etc.		N/A

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
	- insulating material or lining		N/A
22.11 (5.2.10.1)	Cord anchorage for type X attachment:		N/A
	a) at least one part fixed		N/A
	b) types of cable		N/A
	c) no damaging of the cable		N/A
	d) whole cable can be mounted		N/A
	e) no touching of clamping screws		N/A
	f) metal screw not directly on cable		N/A
	g) replacement without special tool		N/A
	Glands not used as anchorage		N/A
	Labyrinth type anchorages		N/A
22.11 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		N/A
22.11 (5.2.10.3)	Tests:		N/A
	- impossible to push cable; unsafe		N/A
	- pull test: 25 times; pull (N)..... :		N/A
	- torque test: torque (Nm)..... :		N/A
	- displacement ≤ 2 mm		N/A
	- no movement of conductors		N/A
	- no damage of cable or cord		N/A
	- function independent of electrical connection		N/A
22.11 (5.2.11)	External wiring passing into luminaire		N/A
22.11 (5.2.12)	Looping- in terminals		N/A
22.11 (5.2.13)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		N/A
22.11 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
22.11 (5.2.16)	Appliance inlets (IEC 60320)		N/A
	Installation couplers (IEC 61535)		N/A
	Other appliance inlet or connector according relevant IEC standard		N/A
22.11 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
22.11 (5.2.18)	Used plug in accordance with		N/A
	- IEC 60083		N/A
	- other standard		N/A
22.11 (5.3)	**Internal wiring**		P
22.11 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		N/A
	- not delivered/ mounting instruction		N/A
	- factory assembled		N/A
	- socket outlet loaded (A)..... :	--	N/A
	- temperatures.....:	(see Annex 2)	N/A
	Green- yellow for earth only		N/A
22.11 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P
	Cross-sectional area (mm²)..... :	see Annex 1	P
	Insulation thickness		P
	Extra insulation added where necessary		N/A
22.11 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		P
	Adequate cross-sectional area and insulation thickness		P
22.11 (5.3.1.3)	Double or reinforced insulation for class II		P
22.11 (5.3.1.4)	Conductors without insulation		N/A
22.11 (5.3.1.5)	SELV current-carrying parts		P
22.11 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
22.11 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		P
	Joints, raising/lowering devices		N/A
	Telescopic tubes etc.		N/A
	No twisting over 360°		P
22.11 (5.3.3)	Insulating bushings:		N/A
	- suitable fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- cables with protective sheath		N/A
22.11 (5.3.4)	Joints and junctions effectively insulated		N/A
22.11 (5.3.5)	Strain on internal wiring		N/A
22.11 (5.3.6)	Wire carriers		N/A
22.11 (5.3.7)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N/A
22.11 (5.4)	**Test to determine suitability of conductors having a reduced cross-sectional area**		N/A
	Under test the temperature of the luminaire wiring insulation not exceed the limits stated in Table 12.2	(see Annex 2)	N/A
	No damage to luminaire wiring after test		N/A
22.11.1 (-)	Permanently connected		N/A

22.12 (8)	**PROTECTION AGAINST ELECTRIC SHOCK**		P
22.12 (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/A

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
	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/A
	Basic insulation only accessible under lamp or starter replacement		N/A
	Protection in any position		P
	Double-ended tungsten filament lamp		N/A
	Insulation lacquer not reliable		N/A
	Double-ended high pressure discharge lamp		N/A
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
22.12 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
22.12 (8.2.3.a)	Class II luminaire:		P
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A
	- basic insulation not accessible other than during starter or lamp replacement		P
	- glass protective shields not used as supplementary insulation		N/A
22.12 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N/A
22.12 (8.2.3.c)	SELV circuits with exposed current carrying parts:		N/A
	Ordinary luminaire:		N/A
	- voltage under load (V).....:	--	N/A
	- no-load voltage (V).....:	--	N/A
	- touch current if applicable (mA) .....:	--	N/A
	One conductive part insulated if required		N/A
	Other than ordinary luminaire:		N/A
	- nominal voltage (V) .....:	--	N/A
	Class III luminaire only for connection to SELV		N/A
	Class III luminaire not provided with means for protective earthing		N/A

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
22.12 (8.2.4)	Portable luminaire have protection independent of supporting surface		N/A
22.12 (8.2.5)	Compliance with the standard test finger or relevant probe		P
22.12 (8.2.6)	Covers reliably secured		P
22.12 (8.2.7)	Luminaire other than below with capacitor > 0,5 µF not exceed 50 V 1 min after disconnection	4V after 1min.	P
	Portable luminaire with capacitor > 0,1 µF (0.25) not exceed 34 V 1 s after disconnection		N/A
	Other luminaires with capacitor > 0,1 µF (0.25) with plug and track adaptors not exceed 60 V 5 s after disconnection		N/A
22.13 (12)	**ENDURANCE TEST AND THERMAL TEST**		P
22.13 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 22.14		—
22.13 (12.2)	**Selection of lamps and ballasts**		—
	Lamp used according Annex B	(Lamp used see Annex 2)	—
	Controlgear if separate and not supplied	(Controlgear used see Annex 2)	—
22.13 (12.3)	Endurance test:		P
	a) mounting- position .....:	Normal used	—
	b) test temperature (°C).....:	50°C	—
	c) total duration (h) .....:	390h	—
	d) supply voltage (V).....:	1.1x240VAC	—
	d) if not equipped with controlgear, constant voltage/current (V) or (A) .....:	--	—
	e) luminaire ceases to operate		—
22.13 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N/A
	- marking legible		P
	- no cracks, deformation etc.		P

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
22.13 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
22.13 (12.5)	Thermal test (abnormal operation)		N/A
22.13 (12.6)	Thermal test (failed lamp control gear condition):		N/A
22.13 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A) .....:	--	—
	- case of abnormal conditions.....:	--	—
	- electronic lamp control gear		N/A
	- measured winding temperature (°C): at 1,1 Un .....:	--	—
	- measured mounting surface temperature (°C) at 1,1 Un.....:	--	N/A
	- calculated mounting surface temperature (°C) .....:	--	N/A
	- track-mounted luminaires		N/A
22.13 (12.6.2)	Temperature sensing control		N/A
	- case of abnormal conditions.....:	--	—
	- thermal link		N/A
	- manual reset cut-out		N/A
	- auto reset cut-out		N/A
	- measured mounting surface temperature (°C).....:	--	N/A
	- track-mounted luminaires		N/A
22.13 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N/A
22.13 (12.7.1)	Luminaire without temperature sensing control		N/A
22.13 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N/A
	Test method 12.7.1.1 or Annex W .....:	--	—
	Test according to 12.7.1.1:		N/A
	- case of abnormal conditions.....:	--	—
	- Ballast failure at supply voltage (V) .....:	--	—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
	Test according to Annex W:		N/A
	- 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 22.16 (13.2.1)	N/A
22.13 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N/A
	- 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 22.16 (13.2.1)	N/A
22.13 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N/A
	- case of abnormal conditions.....:	--	—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
22.13 (12.7.2)	Luminaire with temperature sensing control		N/A
	- 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 22.16 (13.2.1)	N/A
22.13.1 (-)	Endurance test for self-contained luminaire		P
	Operate satisfactory during 50 supply switching		P
22.13.2 (-)	Thermal test 12.4 to 12.5 in IEC 60598-1	(see Annex 2)	P
22.13.3 (-)	Condition of tests		P

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
22.13.4 (-)	Battery discharge		P
22.13.5 (-)	Reduced temperature		P
22.13.6 (-)	Additional thermal test	(see Annex 2)	P
22.13.7 (-)	Provide Vmin according Clause 20 of IEC 61347-2-7 at the end of operation		P
22.14 (9)	**RESISTANCE TO DUST AND MOISTURE**		P
22.14 (-)	The order of tests as specified in clause 22.12		P
22.14 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP..... :	IP20	—
	- mounting position during test.....:	Normal mounting	—
	- fixing screws tightened; torque (Nm).....:	--	—
	- tests according to clauses.....:	Clause 9.2.0	—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N/A
	b) no talcum in dust- tight luminaire		N/A
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		N/A
	c.1) For luminaires without drain holes – no water entry		N/A
	c.2) For luminaires with drain holes – no hazardous water entry		N/A
	d) no water in watertight or pressure watertight luminaire		N/A
	e) no contact with live parts (IP 2X)		P
	e) no entry into enclosure (IP 3X and IP 4X)		N/A
	e) no contact with live parts through drain holes and ventilation slots (IP3X and IP4X)		N/A
	f) no trace of water on part of lamp requiring protection from splashing water		N/A
	g) no damage of protective shield or glass envelope		N/A
22.14 (9.3)	Humidity test 48 h	25°C, 93%RH	P

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict

22.15 (10)	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		P
22.15 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø .....:	Metal foil used	—
	Insulation resistance (MΩ)..... :	See below	—
	SELV		P
	- between current-carrying parts of different polarity:		N/A
	- between current-carrying parts and mounting surface.....:	>100 MΩ	P
	- between current-carrying parts and metal parts of the luminaire.....:	>100 MΩ	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :		N/A
	- Insulation bushings as described in Section 5 ..... :		N/A
	Other than SELV		P
	- between live parts of different polarity..... :	>100 MΩ	P
	- between live parts and mounting surface.....:	>100 MΩ	P
	- between live parts and metal parts.....:	>100 MΩ	P
	- between live parts of different polarity through action of a switch.....:		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :		N/A
	- Insulation bushings as described in Section 5 .....:		N/A
22.15 (10.2.2)	Electric strength test		P
	Dummy lamp		N/A
	Luminaires with ignitors after 24 h test		N/A
	Luminaires with manual ignitors		N/A
	Test voltage (V).....:	See below	P
	SELV		P
	- between current-carrying parts of different polarity:	--	N/A
	- between current-carrying parts and mounting surface.....:	500V	P

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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/A
	- Insulation bushings as described in Section 5 .....:	--	N/A
	Other than SELV		P
	- between live parts of different polarity.....:	1480V	P
	- between live parts and mounting surface.....:	2960V	P
	- between live parts and metal parts.....:	2960V	P
	- between live parts and plastic enclosure.....:		N/A
	- between live parts of different polarity through action of a switch.....:	--	N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts.....:	--	N/A
	- Insulation bushings as described in Section 5 .....:	--	N/A
22.15 (10.3)	Touch current or protective conductor current (mA).:	0.102mA	P
22.16 (13)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		P
22.16 (13.2.1)	Ball-pressure test.....:	See Test Table 22.16 (13.2.1)	P
22.16 (13.3.1)	Needle-flame test (10 s).....:	See Test Table 22.16 (13.3.1)	P
22.16 (13.3.2)	Glow- wire test (650°C).....:	See Test Table 22.16 (13.3.2)	P
22.16 (13.4)	Proof tracking test (IEC 60112).....:	See Test Table 22.16 (13.4)	P
22.16 (-)	Glow-wire test (850°C) if applicable .....:	See Test Table 22.16 (13.3.2)	P
	Glow-wire test (850°C) or fire resistant cable if applicable .....:		N/A
22.17 (-)	**PHOTOMETRIC DATA**		P
22.17.1 (-)	Intensity distribution data provided		P
22.17.2 (-)	If declared values in cd/1 000 lm, reference flux in emergency mode provided		N/A

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
22.17.3 (-)	At least 50% of level declared photometric data 5 s after failure of supply		P
	100% of level declared photometric data		P
	- after 60 s		P
	- after 0,5 s after failure of supply if high-risk task-area lighting		N/A
	Photometric measurements according CIE 121 SP1		P
	LED luminaires measurements according CIE S025		P
	All values at least minimum declared data		P
22.17.4 (-)	Colour-rendering index		P
22.17.5 (-)	Internally illuminated emergency safety sign meet requirements of ISO 30061		P
	Luminance of permanently illuminated safety sign meet requirements of ISO 3864-1 and ISO 3864-4		P
	Luminance measurements according Annex C	(see Annex C)	P
22.18 (-)	**CHANGEOVER OPERATION**		P
	Changeover device comply with Clause 21 of IEC 61347-2-7		P
22.19 (-)	**HIGH TEMPERATURE OPERATION**		P
	Operation at 70°C		P
	Relative light outputs		P
22.20 (-)	**BATTERY CHARGERS FOR SELF-CONTAINED EMERGENCY LUMINAIRES**		P
	Devices for recharging batteries comply with Clause 22 of IEC 61347-2-7		P
22.21 (-)	**TEST DEVICES FOR EMERGENCY OPERATION**		P
22.21.1 (-)	Self-contained luminaire provided with test facility		P
22.21.2 (-)	Remote testing device not influence proper function of safety illumination		N/A
22.21.3 (-)	Indicators colour according IEC 60073		P

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict

22.8 (11.2)	TABLE I: Creepage distances and clearances							P
	Minimum distances (mm) for a.c. up to 30 kHz sinusoidal voltages							P
	Applicable part of IEC 60598-1 Table 11.1.A*, 11.1.B* and 11.2*							P
	Insulation type **	Measured clearance	Required		Measured creepage	Required		
			clearance	*Table		creepage	*Table	
Distance 1:	B	>3.0	1.5	Table 11.1.B	>3.0	2.5	Table 11.1.A	
Distance 2:	B	>8.0	1.5	Table 11.1.B	>8.0	2.5	Table 11.1.A	
Distance 3:	B	>8.0	1.5	Table 11.1.B	>8.0	2.5	Table 11.1.A	
Distance 4:	B	3.2	1.5	Table 11.1.B	3.2	2.5	Table 11.1.A	
Distance 5:	B	2.8	1.5	Table 9	2.8	2.5	Table 7	
Distance 6:	R	6.8	3.0	Table 9	6.8	5.0	Table 7	
Distance 7:	R	6.8	3.0	Table 9	6.8	5.0	Table 7	
Distance 8:	R	>7.0	3.0	Table 9	>7.0	5.0	Table 7	
Distance 9:	R	>7.0	4.7	IEC61558-1	>7.0	5.0	IEC61558-1	
Working voltage (V)..... :					Max. 240V			—
PTI..... :					< 600 ☒ ≥ 600 ☐			—
Pulse voltage or U_P if applicable (kV) ..... :					--			—

Supplementary information:
Distance 1: Between L and N on terminal block.
Distance 2: Between live parts on terminal block and accessible metal parts or mounting surface.
Distance 3: Between LED PCB board and accessible parts or mounting surface
Distance 4: Between L and N before fuse
Distance 5: Between pins of fuse
Distance 6: Between Y capacitor (CY1)
Distance 7: Between input circuits and output circuits on PCB board
Distance 8: Between transformer core and secondary winding
Distance 9: Between transformer Primary circuit trace to secondary circuit trace on PCB

** Insulation type: B – Basic; S – Supplementary; R – Reinforced. See also IEC 60598-1 Annex M.

22.8 (11.2)	TABLE II: Creepage distances and clearances							—
Minimum distances (mm) for a.c. higher than 30 kHz sinusoidal voltages								
Applicable part of IEC 61347-1 Table 7 and 8* or IEC 60664-4 Table 1 and 2								
Distances	Insulation type **	Measured clearance	Required		Measured creepage	Required		
			clearance	*Table		creepage	*Table	

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict

Distance 1:	—	—	—	—	—	—	—
Working voltage (V)..... :					—		—
Frequency if applicable (kHz)..... :					—		—
PTI..... :					< 600 ☐ ≥ 600 ☐		—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :					—		—
Supplementary information:—							

** Insulation type: B – Basic; S – Supplementary; R – Reinforced.

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict

22.16 (13.2.1)	TABLE: Ball Pressure Test of Thermoplastics		P
Allowed impression diameter (mm) .....:		2,0mm	—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)
Lamp cover	See Annex 1	75	1.0
Plastic enclosure	See Annex 1	75	1.0
PCB of driver	See Annex 1	125	0.8
Bobbin of driver	See Annex 1	125	0.8
Connector of LED	See Annex 1	125	1.4
Supplementary information:--			

22.16 (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
Plastic enclosure	See Annex1	30s	No	0s	P
Lens	See Annex1	30s	No	0s	P
PCB	See Annex1	30s	No	0s	P
Bobbin	See Annex1	30s	No	0s	P
Connector	See Annex1	30s	No	0s	P
Supplementary information:--					

22.16 (13.3.2)	TABLE: Glow-wire test (IEC 60695-2-11)			P
Glow wire temperature .....:		650°C or 750°C or 850°C		—
Object/ Part No./ Material	Manufacturer/ trademark	Ignition of specified layer Yes/No	Duration of burning (tb)(s)	Verdict
Plastic enclosure(850°C)	See Annex1	No	0s	P
Lens(650°C)	See Annex1	No	0s	P
Terminal block (750°C)	See Annex1	No	0s	P
Test switch (750°C)	See Annex1	No	0s	P
PCB (750°C)	See Annex1	No	0s	P
Bobbin (750°C)	See Annex1	No	0s	P

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict

Capacitor (750°C)	See Annex1	No	0s	P
Connector (750°C)	See Annex1	No	0s	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~~).....:				Yes
Supplementary information:--				

22.16 (13.4)	**TABLE: Proof tracking test (IEC 60112)**				**N/A**
Test voltage PTI ..... :		175 V			—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
--	--	--	--	--	--
Supplementary information:					

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict

	Annex A: Batteries for self-contained emergency luminaires		P
A.1	Type of batteries	Li-ion Battery	P
A.2	Battery conform to relevant standard	IEC 62133	P
	Luminaire operate within specific tolerances		P
A.3	Battery capacity		P
A.4	**Sealed nickel cadmium batteries**		N/A
A.4.1	Battery conform to IEC 61951-1		N/A
A.4.2.a	Maximum surface temperature of the battery °C..... :	--	N/A
A.4.2.b	Maximum overcharge rate 0,08 C_5A		N/A
A.4.2.c	Minimum ambient temperature of the cells 5 °C		N/A
A.4.2.d	Maximum discharge rates		N/A
A.5	**Sealed nickel metal-hydride batteries**		N/A
A.5.1	Battery conform to IEC 61951-2		N/A
A.5.2.a	Maximum case temperature of the battery °C.....:	--	N/A
A.5.2.b	Maximum overcharge rate 0,08 C_5A		N/A
A.5.2.c	Minimum ambient temperature of the cells 5 °C		N/A
A.5.2.d	Maximum discharge rates		N/A
A.6	**Valve regulated lead acid batteries**		N/A
A.6.1	Battery conform to relevant part of IEC 60869-21 or IEC 61056-1		N/A
A.6.2.a	Maximum surface temperature of the battery °C..... :	--	N/A
A.6.2.b	Maximum recharge current 0,4 C20		N/A
A.6.2.c	Maximum discharge rates		N/A
A.6.2.d	Maximum r.m.s. ripple current 0,1 C_{20}		N/A
A.6.2.e	Minimum ambient temperature of the cells 5 °C		N/A
A.7	Ambient temperature of the cells measured after 48 h		N/A
A.8	Alternative operating parameters and evidence if operating outside limits in A.4 and A.5		N/A
A.9	Battery only replaced by a competent person		N/A

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
	Annex B: Luminaire classification		P
	Classified and marked according Annex B.....:	See the rating label	P
	Annex C: Luminance measurements		N/A
C.1	Contrast measurements		N/A
C.2	On site photometric tests		N/A
	according to Annex C of ISO 3864-4		N/A
	Measured values not less than specified in this standard		N/A
	Annex E: Requirements for self-contained portable emergency luminaires		N/A
E.5	**Classification of luminaires**		N/A
	Base unit and portable emergency luminaires with mains-voltage supplied integrated charger of Class I or Class II		N/A
	Self-contained portable emergency luminaire without integrated mains-voltage supplied charger of Class III		N/A
E.5.1	Classified according construction		—
E.5.1.a	Control unit contained in the self-contained portable emergency luminaire	Yes☐ No☐	—
E.5.1.b	Part of the control unit remains in the base unit	Yes☐ No☐	—
E.5.2	Classified according operation		—
E.5.2.a	Automatic initiation with manual control	Yes☐ No☐	—
E.5.2.b	Automatic initiation with automatic control	Yes☐ No☐	—
E.5.2.c	Manual control	Yes☐ No☐	—
E.5.3	Classified according photometric performance		—
	Distribution measured according IEC TR 61341		N/A
E.5.3.a	Narrow beam angels not greater than 15°		N/A
E.5.3.b	Medium beam angels between 15° and 25°		N/A
E.5.3.c	Wide beam angels greater than 25°		N/A
E.5.3.d	Variable beam angels – state the range of angels		N/A
E.6	**Marking**		N/A
E.6.1	Marking visible after installation		N/A
	Marking on both parts if separate charging device		N/A

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
	Class II symbol only on the charger if separate charging device		N/A
E.6.2	Instruction for electrical, mechanical and use according classification		N/A
E.6.3	Warning notice on both parts to return the luminaire to base unit for recharging after use		N/A
E.6.4	Instruction with photometric data		N/A
E.7	**Construction**		N/A
E.7.1	Control unit completely contained in the luminaire or part of the control unit in the base unit		N/A
E.7.2	Mechanical strength tests according 4.13 of IEC 60598-1		N/A
	Mechanical strength tests according 4.13.4 of IEC 60598-1 of portable section		N/A
E.7.3	Base unit permanently connected to unswitched supply		N/A
E.7.4	Integral manual switch used to switch the unit between inhibit mode and emergency mode and vice versa		N/A
	Recharging before supply voltage reach 0,85 times nominal value		N/A
E.7.5	Integral over current protection device connected immediately after the terminals connecting to the supply		N/A
E.7.6	Power supply connection between the luminaire and its base unit made without a tool		N/A
	Connecting devices according relevant standard		N/A
E.7.7	No access to live parts during or after connection or disconnection		N/A
E.7.8	Supply cable disconnected from the portable part before use		N/A
E.7.9	Connection between the portable part and the charger mechanically interlocked to prevent incorrect polarised connection		N/A
E.7.10	At least two independent replaceable lamps if incandescent lamps		N/A
E.7.11	Colour rendering index of any emergency lamps *Ra* 40 or better		N/A
E.7.12	Audible and/or visible warning on re-instatement of normal supply		N/A

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
E.7.13	Failure of the mains supply the luminaire operate in emergency mode or an indicator identify the location of the luminaire		N/A
	Load ≤ 0,01C5/h of the battery if indicator is used		N/A
E.7.14	Indicator give warning of low battery capacity remaining		N/A
E.7.15	Adequate stability		N/A
	Test at an angle of 15° to the horizontal		N/A
E.7.16	Adequate stability to illuminate the task area on non-horizontal surface		N/A
	Test at an angle of 15° to the horizontal		N/A
E.8	**Changeover operation**		N/A
	Requirements according 22.7.10 excluded if integral manual switch		N/A
	Design avoid switching of charger whilst holding the luminaire		N/A
E.9	**High temperature operation**		—
	Ambient temperature of 40°C in Clause 22.19		—
E.10	**Thermal test**		—
	Test made with portable part either placed on dull black painted wooden floor or rest against a dull black painted wooden wall		—

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 1	TABLE: Critical components information					P
Object / part No.	**Code**	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
Plastic enclosure	C	CHI MEI CORPORATION	PC-6710(a)	PC,V-0,130℃	--	UL E56070
LED cover	C	CHI MEI CORPORATION	PC-6710(a)	PC,V-0,130℃	--	UL E56070
Terminal block	B	BJB GmbH & Co. KG	46.413	AC450V; T85; 24A/16A; 0,5…2,5mm²	DIN EN 60998-2-2	VDE 40034941
LED PCB	C	NINGBO KJPCB ELECTRONIC TECHNOLOGY CO LTD	KJ-02	V-0;;Max 1,5mm;130℃	--	UL E474795
LED	C	EVERLIGHT ELECTRONICS CO., LTD	SMD2835	Ra>80; Tc: 2700-6500K	IEC TR 62778	Tested with appliance
Input wire of driver	B	Xiangshan Fahua Electric Wire & Cable Co., Ltd.	H05V-U	1 x 0,75 mm²	VDE 0285-525-2-31	VDE 40031495
Plastic enclosure of driver	C	CHI MEI CORPORATION	PC-6710(a)	PC,V-0,130℃	--	UL E56070
Output wire of driver/ LED / Indicator	B	RUIAN XINZHOU WIRE & CABLE CO LTD	1015	18-24AWG; 600V,105℃	--	UL E308748
PCB	C	KINGBOARD LAMINATES HOLDINGS LTD	KB-5150 KB-5152	V-0	--	UL E123995
Fuse	B	Shenzhen Lanson Electronics Co. Ltd.	SMT T2A250V	250VAC; 2A	DIN EN 60127-1	VDE 40012592
X-cap	B	Dain Electronics Co., Ltd.	MEX	0,47uF Max, 275V/310V, 40/110/21	DIN EN 60384-14	VDE 40018798
Varistor	B	Hongzhi Enterprises Ltd.	HEL10D471K,	470V, 125℃	DIN EN 61051-1	VDE 40037512
Y-cap	B	Hongzhi Enterprises Ltd.	X1Y1	AC400V, 2200pF 125℃	DIN EN 60384-14	VDE 40038760
Winding	C	HANGZHOU WEIFENG ELECTRONIC CO LTD	MW 79-C	155°C	--	UL E229341
Bobbin	C	SUMITOMO BAKELITE CO LTD	PM-9820	150,V-0,	--	UL E41429
Triple insulation wire	B	Wuhu Ouiy Electronics Co., Ltd.	OLTIW-F	Class F	DIN EN 62368-1	VDE 40040893

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict

Teflon Tube	C	CHANGYUAN ELECTRONICS (SHENZHEN) CO LTD	CB-TT-T CB-TT-L CB-TT-S	200°C	--	UL E180908
Insulation tape	C	Jingjiang Yahua Pressure Sensitive Glue Co Ltd	CT-280, PZ	130 degree C	--	UL:E165111
Connector (white)	C	NEO-NEON LED LIGHTING INTERNATIONAL LTD	YY-058	PVC; V-0	--	UL E201139
Connector (black/red)	C	CWB GROUP CO LTD	VH-2A	300VAC; 10A	--	UL E200881
Opto-coupler	B	Everlight Electronics Co., Ltd.	CNY64	110℃,reinforced insulation>=9.7 mm	IEC 60474-5-5	VDE 40027351
Battery	B	Shangdong zhongxin Dison Power Supply Co.,Ltd	IFR 18650-1.6Ah	3.2V, 1600mAh, 2pcs	IEC 62133-2	JPTUV-098723
Test switch	C	SHENZHEN HONGJU ELECTRONICS CO.,LTD	PB-05B	3A,125V	IEC 61058.1	Tested with appliance

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

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12		P
	Type reference.....:	DS-ES-04M	—
	Lamp used.....:	LED lamp	—
	Lamp control gear used.....:	Internal LED driver	—
	Mounting position of luminaire.....:	Mounting acc. to user manual	—
	Supply wattage (W).....:	See below	—
	Supply current (A)..... :	See below	—
	Calculated power factor.....:	See below	—
	Table: measured temperatures corrected for ta = 40 °C:		P
	- abnormal operating mode.....:	Replacement of batteries with a short-circuit link across the battery charger output: the batteries is unit shut down.	—
	- test 1: rated voltage.....:	--	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage.....:	a, Charge mode: 1.06x240V=254.4V(0.051A, 5.75W, 0.441PF); b, Discharge mode: 6.55VDC, 0.249A, 1.63W	—
	- 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	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1	test 2a normal operating mode	test 2b emergency lighting mode	limit	test 4	limit
Terminal block	--	44.0	41.0	85	--	--
Input wire of driver	--	46.5	41.3	90	--	--
L1 winding	--	56.3	41.1	150	--	--
L1 bobbin	--	53.5	41.5	155	--	--

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict

X-cap(CX1)	--	54.4	41.6	110	--	--
C15	--	56.5	41.4	105	--	--
L2	--	57.7	41.7	150	--	--
T1 winding	--	58.9	41.5	150	--	--
T1 bobbin	--	58.2	41.3	155	--	--
CY1	--	57.1	41.0	125	--	--
Driver PCB	--	54.3	40.8	130	--	--
CN4	--	45.0	40.5	130	--	--
CN5	--	44.8	40.4	130	--	--
Wire for battery	--	43.5	41.4	105	--	--
Battery surface	--	45.4	43.2	55	--	--
Wire near LED	--	45.2	43.4	105	--	--
LED PCB	--	46.2	44.3	130	--	--
Lamp cover	--	41.1	40.8	130	--	--
Mounting surface	--	41.7	40.7	90	--	--
Ambient	--	40.0	40.0	--	--	--

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12		P
	Type reference.....:	DS-ES-03M	—
	Lamp used.....:	LED lamp	—
	Lamp control gear used.....:	Integral LED driver	—
	Mounting position of luminaire.....:	Mounting acc. to user manual	—
	Supply wattage (W).....:	See below	—
	Supply current (A)..... :	See below	—
	Calculated power factor.....:	See below	—
	Table: measured temperatures corrected for ta = 40 °C:		P
	- abnormal operating mode.....:	Replacement of batteries with a short-circuit link across the battery charger output: the batteries is unit shut down.	—
	- test 1: rated voltage..... :	--	—

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage.....:	a, Charge mode: 1.06x240V=254.4V(0.052A, 5.64W, 0.423PF); b, Discharge mode: 6.61VDC, 0.291A, 1.92W	—
	- 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	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1	test 2a normal operating mode	test 2b emergency lighting mode	limit	test 4	limit
Terminal block	--	44.5	42.2	85	--	--
Input wire of driver	--	47.2	43.5	90	--	--
L1 winding	--	56.1	44.2	150	--	--
L1 bobbin	--	53.4	43.7	155	--	--
X-cap(CX1)	--	54.8	42.6	110	--	--
C15	--	56.7	42.5	105	--	--
L2	--	57.5	42.6	150	--	--
T1 winding	--	58.6	42.8	150	--	--
T1 bobbin	--	57.1	41.7	155	--	--
CY1	--	56.5	41.9	125	--	--
Driver PCB	--	54.1	43.8	130	--	--
CN4	--	47.2	41.0	130	--	--
CN5	--	46.9	41.2	130	--	--
Wire for battery	--	46.0	43.1	105	--	--
Battery surface	--	47.6	46.0	55	--	--
Wire near LED	--	48.9	47.5	105	--	--
LED PCB	--	50.6	48.9	130	--	--
Lamp cover	--	44.3	43.7	130	--	--

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict

Mounting surface	--	43.3	41.5	90	--	--
Ambient	--	40.0	40.0	--	--	--

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12		P
	Type reference.....:	DS-ES-01M	—
	Lamp used.....:	LED lamp	—
	Lamp control gear used.....:	Integral LED driver	—
	Mounting position of luminaire.....:	Mounting acc. to user manual	—
	Supply wattage (W).....:	See below	—
	Supply current (A)..... :	See below	—
	Calculated power factor.....:	See below	—
	Table: measured temperatures corrected for ta = 40 °C:		P
	- abnormal operating mode.....:	Replacement of batteries with a short-circuit link across the battery charger output: the batteries is unit shut down.	—
	- test 1: rated voltage.....:	--	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage.....:	a, Charge mode: 1.06x240V=254.4V(0.05A, 5.54W, 0.43PF); b, Discharge mode: 6.54VDC, 0.270A, 1.77W	—
	- 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	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1	test 2a normal operating mode	test 2b emergency lighting mode	limit	test 4	limit
Battery surface	--	46.8	43.5	55	--	--
Wire near LED	--	48.3	45.7	105	--	--

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict

LED PCB	--	50.8	47.9	130	--	--
Lamp cover	--	46.4	42.9	130	--	--
Mounting surface	--	43.1	41.6	90	--	--
Ambient	--	40.0	40.0	--	--	--

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict

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

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
ANNEX 4	**Screwless terminals (part of the luminaire)**		N/A
(15)	**SCREWLESS TERMINALS**		N/A
(15.2)	Type of terminal.....:		—
	Rated current (A).....:		—
(15.3.1)	Material		N/A
(15.3.2)	Clamping		N/A
(15.3.3)	Stop		N/A
(15.3.4)	Unprepared conductors		N/A
(15.3.5)	Pressure on insulating material		N/A
(15.3.6)	Clear connection method		N/A
(15.3.7)	Clamping independently		N/A
(15.3.8)	Fixed in position		N/A
(15.3.10)	Conductor size		N/A
	Type of conductor		N/A
(15.5)	Terminals and connections for internal wiring		N/A
(15.5.1)	Mechanical tests		N/A
(15.5.1.1.1)	Pull test spring-type terminals (4 N, 4 samples).....:		N/A
(15.5.1.1.2)	Pull test pin or tab terminals (4 N, 4 samples).....:		N/A
	Insertion force not exceeding 50 N		N/A
(15.5.1.2)	Permanent connections: pull-off test (20 N)		N/A
(15.5.2)	Electrical tests		N/A
	Voltage drop (mV) after 1 h (4 samples)..... :		N/A
	Voltage drop of two inseparable joints		N/A
	Number of cycles:		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples).....:		N/A
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples).....:		N/A
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples).....:		N/A
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples)..... :		N/A
(15.6)	Terminals and connections for external wiring		N/A

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict

(15.6.1)	Conductors		N/A
	Terminal size and rating		N/A
15.6.2	Mechanical tests		N/A
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) ..... :		N/A
(15.6.2.2)	Pull test pin or tab terminals (4 samples); pull (N) .....:		N/A
(15.6.3)	Electrical tests		N/A
	Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1		N/A

(15.6.3.1) (15.6.3.2)	**TABLE: Contact resistance test / Heating tests**									N/A
	Voltage drop (mV) after 1 h									—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										
	Voltage drop of two inseparable joints									
	Voltage drop after 10th alt. 25th cycle									
	Max. allowed voltage drop (mV).....:									—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										
	Voltage drop after 50th alt. 100th cycle									
	Max. allowed voltage drop (mV).....:									—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										
	Continued ageing: voltage drop after 10th alt. 25th cycle									
	Max. allowed voltage drop (mV).....:									—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										
	Continued ageing: voltage drop after 50th alt. 100th cycle									
	Max. allowed voltage drop (mV).....:									—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:--

Attachment No.1

AS/NZS 60598.1:2017+A1:2017+A2:2020			
Clause	Requirement + Test	Result - Remark	Verdict

0	**GENERAL INTRODUCTION**		**P**
0.1	**Add:** Where the term “lamp” is used in this Standard, it is taken to include electric light sources. LED light sources are subject to the same test parameters as “other discharge lamps”.		P
	NOTE **Portable rechargeable battery operated luminaires** should comply with Annex B, ‘Appliances powered by rechargeable batteries’ of AS/NZS 60335.1, Household and similar electrical appliances—Safety, Part 1: General requirements (IEC 60335-1 ED. 5, MOD). In addition, portable, rechargeable, battery-operated luminaires with lithium ion batteries should have overvoltage protection.		—
0.4.2	**Add:** In Australia, for equipment, other than class III equipment, that is intended for connection to the supply mains **and not marked with**: - a rated voltage of at least 240 V for single-phase equipment or a rated voltage of at least 415 V for three-phase equipment; or - a rated voltage range that includes 240 V for single-phase equipment and415 V for three-phase equipment, the rated voltage is equal to 240 V for single-phase equipment and 415 V for three-phase equipment, and the upper limit of the voltage range is equal to 240V for single-phase equipment and 415 V for three-phase equipment.		P
0.5	**Add:** Relevant Australian/New Zealand Standard replaces the IEC Standard unless otherwise specified.		P
0.5.101	**Add:** Capacitors		N/A
	Capacitors shall be of a type to ensure that any capacitor failure results in a failsafe outcome.		N/A

Attachment No.1

AS/NZS 60598.1:2017+A1:2017+A2:2020			
Clause	Requirement + Test	Result - Remark	Verdict
	Capacitors (**other than those incorporated in control gear** that comply with there levant standard) shall comply with one of the following: - Capacitors likely to be permanently subjected to the supply voltage, used for radio interference suppression or for voltage dividing shall comply with IEC 60384-14. - Other 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 EIA-456-A, Metallized Film Dielectric Capacitors for Alternating Current Applications, shall comply with IEC 61049 and IEC 61048:2006 excluding the endurance test of 18.1.1.		N/A
	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.		N/A
0.5.102	**Add:**Control gear		P
	Power supplies shall comply with the relevant part 2 of the AS/NZS 61558series.		N/A
	Control gear shall comply with the relevant part 2 of the AS/NZS 61347series.		P
	Battery chargers used for lighting other than emergency lighting shall comply with AS/NZS 60335.2.29.		N/A
	Sensor switches and similar control circuits, including those incorporated in other equipment, are considered electronic switches (see Clause 4.8).		N/A
2	**CLASSIFICATION OF LUMINAIRES**		N/A
2.2	**Class 0 luminaires** are not permitted in Australia or New Zealand.		—
3	**MARKING**		**P**
3.1	In Australia and New Zealand, instructions and other texts required by this Standard shall at least be written in English.		P
3.2	**Delete** the second paragraph beginning with ‘Marking may be on ballast provided…’.		P

Attachment No.1

AS/NZS 60598.1:2017+A1:2017+A2:2020			
Clause	Requirement + Test	Result - Remark	Verdict
Table 3.1	Move item 3.2.21 from the second column to the third column. 3.2.21 The relevant symbol for luminaires not suitable for covering with thermally insulating material		N/A
3.2.3	**The rated maximum ambient temperature t_a.** (see Figure 1).		P
3.2.12	**Add:** In Australia, luminaires for household use and similar with supply cords which arenot fitted with a plug shall be marked with a cord tag with the symbol for “must be installed by a licensed electrician”.		N/A
3.2.23	**Add:** The additional information shall include the symbol "Do not stare at the operating light source" (see Figure 1) along with an explanation of the symbol.		N/A
3.3.7	**Delete Clause and replace with**: 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 10 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/A
3.3.18	**Delete** the text ‘, i.e. for indoor use only’.		N/A
3.3.21	**Delete** the text ‘Caution, risk of electric shock’ and the symbol.		P
3.3.101	The instructions shall contain details of the components in the luminaire that require replacement as part of a maintenance program.		N/A
3.3.102	The instructions for luminaires, including for remotes or other accessories **containing coin/button cell batteries and batteries designated R1**, shall include the safety warnings below.		N/A
	The safety warnings are not required where these batteries are not intended to be replaced or are only accessible after damaging the equipment.		—

Attachment No.1

AS/NZS 60598.1:2017+A1:2017+A2:2020			
Clause	Requirement + Test	Result - Remark	Verdict
	The safety warnings: – CAUTION: Do not ingest battery—Chemical burn hazard [or equivalent wording]. – [The remote control supplied with] this product contains a coin/button cell battery. If the coin/button cell battery is swallowed, it can cause severe internal burns in just 2 hours and can lead to death. – Keep new and used batteries away from children. – If the battery compartment does not close securely, stop using the product and keep it away from children. – If you think batteries might have been swallowed or placed inside any part of the body, seek immediate medical attention.		N/A
3.3.103	Luminaires intended to be fixed to the wall and are supplied with a plug and a cord are supplied with a cord tag with the substance of the following wording: **WARNING: THE FLEXIBLE WIRING CONNECTED TO THIS LUMINAIRE SHALL BE EFFECTIVELY FIXED TO THE WALL.** NOTE The warning is intended to prevent strangulation and shock hazard to children.		N/A
4	**CONSTRUCTION**		**P**
4.7.2	**Delete** the first paragraph and r**eplace with** the following: Terminals shall be located or shielded in such a way that, if a wire of a stranded conductor escapes from a terminal when the conductors are fitted, there is no risk of contact between live parts and metal parts that can be touched with the standard test finger, **nor shall it be possible to touch a live free wire with the standard test finger** when the luminaire is fully assembled for use or open for there placement of replaceable light sources or starters.		P
4.8	**Add:** Switches shall comply with AS/NZS 3133, the AS/NZS 60669 series or AS/NZS 61058.1. Switches that indicate an off position shall have contacts with an air break and comply with AS/NZS 3133, AS/NZS 60669.1 or AS/NZS 61058.1.		P
	Electronic switches, when incorporated in or supplied with the luminaire, shall comply with the requirements of AS/NZS 60669.2.1 or IEC 61058-1 classified for 10,000 operating cycles	for 10,000 operating cycles	P

Attachment No.1

AS/NZS 60598.1:2017+A1:2017+A2:2020			
Clause	Requirement + Test	Result - Remark	Verdict
4.10.4	**Delete the last sentence and replace with the following::** If the working voltage does not exceed the rated voltage of the capacitor, accessible conductive parts separated from live parts by double or reinforced insulation, as above, may be bridged by a single Y1 capacitor with qualification approval as specified in IEC 60384-14.		N/A
4.14.6	**Add:** A fixed socket-outlet complying with AS/NZS 3112 or AS/NZS 60884.1 is used for the test.		N/A
4.32	**Add:** **Metal oxide varistors** shall comply with the requirements of AS/NZS 3100 for metal oxide varistors incorporated in accessories.		N/A
4.32	**Delete the text and replace with the following:**		—
4.32.1	**General**		N/A
	To limit the effects of lightning surges and other transient overvoltages, overvoltage protective devices may be used in luminaires and they can be either □ Surge protective devices (SPDs), or □ Surge protective components (SPCs).		N/A
4.32.2	**Surge protective devices (SPDs)**		N/A
	SPDs shall comply with IEC 61643-11. SPDs that are external to controlgear and connected to earth shall be used only in fixed luminaires and shall be connected only to a protective earth.		N/A
4.32.3	**Surge protective components (SPCs)**		N/A
	SPCs that are **external to controlgear** shall comply with the requirements of AS/NZS 3100 for varistors.		N/A
(3.16)	**Metal Oxide Varistors incorporated in accessories**		N/A
	(a) MOVs shall comply with IEC 61051-2.		N/A

Attachment No.1

AS/NZS 60598.1:2017+A1:2017+A2:2020			
Clause	Requirement + Test	Result - Remark	Verdict
	(b) MOVs shall have a maximum continuous voltage rating of: - at least 1.25 times the rated voltage of the accessory or - at least 1.25 times the upper voltage of the rated voltage range.		N/A
	(c) The body of any MOV shall have a flammability category of V-0 or better according to AS/NZS 60695.11.10.		N/A
	(d) Accessories shall be protected against sudden failure of MOVs. Protection shall be provided by: - a 10 A maximum rated fuse of adequate breaking capacity, or equivalent, connected in series with the MOV; or - another protective device, provided that the combination complies with a limited shortcircuit test, with the MOV shorted out. The accessory shall be tested in accordance with 9.3.1 of IEC 60127-1, Method A, for breaking capacity of 1500 A. The test result shall be assessed against the criteria of clause 8.15.10.		N/A
	(e) Accessories shall be protected against gradual failure of MOVs. Compliance is checked by the test of clause 8.15.9.		N/A
(8.15.9)	Equipment incorporating Metal Oxide Varistors (MOVs)		N/A
4.101.1	**Small batteries**		N/A
	Button cells and batteries designated R1 shall not be removable without the aid of a tool unless the cover of their compartment can only be opened after **at least two independent movements** have been applied simultaneously. Refer to AS/NZS 60335.1:2011 Clause 22.54. NOTE: Batteries are specified in IEC 60086-2.		N/A
	Compliance is checked by inspection and by the following test:		—

Attachment No.1

AS/NZS 60598.1:2017+A1:2017+A2:2020			
Clause	Requirement + Test	Result - Remark	Verdict
	A force is applied without jerks for 10 s in the most unfavourable direction to parts likely to be weak. The force is as follows: –push force, 50 N; – pull force; 30 N; – if the shape of the part is such that the fingertips cannot easily slip off, 50 N; – if the projection of the part that is gripped is less than 10 mm in the direction of removal, 30 N. While the force is being applied, the test fingernail of Figure 7 of AS/NZS 60335.1 is inserted in any aperture or joint with a force of 10 N. The fingernail is then slid sideways with a force of 10 N but is not twisted or used as a lever.		N/A
	If the shape of the part is such that an axial pull is unlikely, the pull force is not applied but the test fingernail is inserted in any aperture or joint with a force of10 N and is then pulled for 10 s by means of the loop with a force of 30N in the direction of removal.		N/A
	If the part is likely to be twisted, the following torque is applied at the same time as the pull or push force: – 2 Nm, for major dimensions up to 50 mm. – 4 Nm, for major dimensions over 50 mm. This torque is also applied when the test fingernail is pulled by means of the loop. If the projection of the part that is gripped is less than 10 mm, the torque is reduced by 50 %.....:	4 Nm	N/A
4.101.1 **4.101.2**	**Battery compartment fasteners**		N/A
	If screws or similar fasteners are used to secure a door or cover providing access to the battery compartment, the screw or similar fastener shall be captive to ensure that it remains with the door, cover or equipment.		
	Compliance is checked by inspection and by the following test:		—
	A force of 20 N is applied to the screw or similar fastener without jerks for a duration of 10 s in any direction.		N/A

5	**EXTERNAL AND INTERNAL WIRING**	**P**

Attachment No.1

AS/NZS 60598.1:2017+A1:2017+A2:2020			
Clause	Requirement + Test	Result - Remark	Verdict
5.2.1	First paragraph **replaced by**: 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 leads (tails) in accordance with Clause 4.6 requirements; – supply cord; – supply cord and plug; – adapter for engagement with supply tracks; – appliance inlet; – installation coupler; – luminaire coupler. Portable luminaires: – supply cord with plug; – appliance inlet; – inlet plug complying with AS/NZS 3120. Track-mounted luminaires: — adaptor; — connector.	Terminal block	P
	Delete the second and third paragraph.		—
	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 the relevant 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. For other than portable luminaires a plug is not required if the luminaire has markings and instructions in accordance with Clause 3.2.12.		N/A
	The plug portion of a luminaire with integral pins shall comply with there levant requirements of AS/NZS 3112.		N/A
	NOTE 4 PVC-insulated connection cords should not be used with outdoor luminaires in cold alpine locations.		—

Attachment No.1

AS/NZS 60598.1:2017+A1:2017+A2:2020			
Clause	Requirement + Test	Result - Remark	Verdict

5.2.2	First paragraph **replaced by**: 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.		N/A

Table 5.1 — Supply cord

Luminaire	Rubber	PVC	No insulation
Ordinary class I luminaires	60245 IEC 51S [c]	60227 IEC 52 [c]	
Ordinary class II luminaires	60245 IEC 53 [c]	60227 IEC 52 [c]	
Luminaires which are other than ordinary class I and II	60245 IEC 57 [c]	60227 IEC 53 [ac]	
Portable rough service luminaires	60245 IEC 66 [c]	PVC insulated and sheathed heavy duty flexible cord	
Class III or with SELV circuits luminaires (up to 25 V a.c./60 V d.c.)			Un-insulated conductor [b]
Class III or with SELV circuits luminaires (above 25 V a.c./60 V d.c.), including 50 V a.c./120 V d.c.	Unsheathed basic insulated conductor		

[a] For indoor use only.

[b] AS/NZS 3000 may restrict the use of un-insulated conductors in certain special installations.

[c] For supply voltages greater than 250 V, higher voltage grade cables and cords than those given in the above table may be necessary.

Third paragraph **replaced by**:

To provide adequate mechanical strength, the nominal cross-sectional area of the conductors shall be not less than:

— 0,75 mm^2;

— 1,0 mm^2 for portable rough service luminaires.

Attachment No.1

AS/NZS 60598.1:2017+A1:2017+A2:2020			
Clause	Requirement + Test	Result - Remark	Verdict
5.2.16	**Add:** Class II luminaires for fixed wiring incorporating an appliance coupler shall not have means to allow further luminaires to be connected, including looping in by cascading. Luminaire couplers incorporated with the luminaire shall comply with IEC 61995-1. 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/A
5.2.18	**Replaced by:** 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 befitted with a plug complying with AS/NZS 3112, unless they have the warning allowed by Clause 3.2.12.		N/A
5.3.1	Third paragraph **replaced with** the following: 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.		P
	NOTE 3 Internal wires of other colours are not precluded from making protective earthing connections		—
5.3.1.3	**Replaced by**: In class II luminaires, where the internal wiring has a live conductor and the wiring insulation may touch accessible metal parts under normal operating conditions, the insulation, at least at the places of contact, shall comply with the requirements for double or reinforced insulation, e.g. by applying sheathed cables or sleeves.		N/A

7	**PROVISION FOR EARTHING**		**N/A**
7.2.11	Third paragraph **replaced with** the following: All conductors, whether internal or external, coloured green, yellow or green/yellow combination, shall only be connected to an earthing terminal.		N/A

Attachment No.1

AS/NZS 60598.1:2017+A1:2017+A2:2020			
Clause	Requirement + Test	Result - Remark	Verdict
8	**PROTECTION AGAINST ELECTRIC SHOCK**		**P**
8.2.1	First two paragraphs including Note 1 **replace by** following: Luminaires shall be so constructed that their live parts and basic insulation are not accessible when the luminaire has been installed and wired as in normal use. Live parts shall not be accessible when the luminaire is opened as necessary for user cleaning or maintenance, or for replacement of lamps, replaceable light sources or (replaceable) starters, even if the operation cannot be achieved by hand. This does not apply to the non-current-carrying parts of caps which comply with the relevant IEC safety standard.		P
	Covers that can be removed by hand shall be removed.		—
9	**RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE**		**P**
9.2	**Add** after NOTE 1**:** NOTE 101 A designation of IPX7 or IPX8 is considered unsuitable for exposure to waterjets (designated by IPX5 or IPX6) and may not comply with requirements for second numeral 5 or 6 unless it is dual coded.		—
10	**INSULATION RESISTANCE AND ELECTRIC STRENGTH,TOUCH CURRENT AND PROTECTIVE CONDUCTOR CURRENT**		**P**
10.2	During these tests, the following components shall be disconnected, so that the test voltages are applied to the insulation of the components, but not to the capacitive, or inductive or other functional elements of these components, as appropriate: (a) Shunt-connected capacitors. (b) Capacitors between live parts and the body. (c) **Protective impedance device**. (d) Chokes or transformers connected between live parts. (e) **Overvoltage protective devices in accordance with 4.32 of this Standard.** (f) **Controlgear that conforms with the relevant requirements of IEC 61347 series.**		—

Attachment No.1

AS/NZS 60598.1:2017+A1:2017+A2:2020			
Clause	Requirement + Test	Result - Remark	Verdict
	Delete the seventh paragraph which reads: For fixed Class 1 luminaires, overvoltage protective devices that comply with IEC 61643-11 shall be disconnected from the circuit.		—
10.3	**Delete** the second row beginning with 'Class I luminaires rated up to and including 16 A…'. First column, third row, deletes the word 'Metal'.		—

12	**ENDURANCE TEST AND THERMAL TEST**		**P**
Table 12.1	First column, first row, the text **replaced by**: 'Case (of **control gear**, capacitor, starting device, electronic ballast or convertor, etc.)'		—
	Add: NOTE 101 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 h. This t-life is often marked as ta and is the temperature of the air in the vicinity of the component and is not related to the luminaire ta. As such, luminaire manufacturers should measure air temperature in the vicinity of such components, within the luminaire, as even those complying with their tc point measurements can still fail prematurely if t-life is exceeded.		—

13.3	**Resistance to flame and ignition**		**P**
	Parts of non-metallic material shall be resistant to flame and ignition		P
	For materials other than ceramic, compliance is checked by the tests of 13.3.1 and 13.3.2, and 13.3.3 as appropriate.		P
	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		P
	This Clause applies to all parts, including components, even if they have been tested to their own IEC or equivalent standard		P

Attachment No.1

AS/NZS 60598.1:2017+A1:2017+A2:2020			
Clause	Requirement + Test	Result - Remark	Verdict
13.3.1	Parts of non-metallic material supporting connections that could become an ignition source, and parts of non-metallic material within a distance of 3 mm of such connections, shall withstand the glow wire test		P
	Welded connections, soldered connections on printed circuit boards and other connections carrying less than 0.2 A during normal operation are not considered to be an ignition source.		P
	The glow wire is heated to 750 °C and applied to one test sample for 30 s	See table 13.3.2 in IEC 60598-2-22 report	P
13.3.2	All other parts of non-metallic material which do not support connections that could become an ignition source, but provide protection against electric shock or maintain creepage and clearances, shall withstand the glow wire test.		P
	The glow wire is heated to 650 °C and applied to one test sample for 30 s	See table 13.3.2 in IEC 60598-2-22 report	P
13.3.3	During the application of the glow wire test of Clause 13.3.1 and 13.3.2, if a flame is produced that persists for longer than 2 s, the luminaire is further tested as follows: The needle-flame is applied to one test sample for 30 s.		N/A
	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.		N/A
	Parts shielded by a barrier that meets the needle-flame test of AS/NZS 60695.11.5 are not tested.		N/A
	The needle-flame test is not carried out on parts that are made of material classified as V-0 or V-1 according to IEC 60695-11-10. The sample of material submitted to the test of IEC 60695-11-10 shall be no thicker than the relevant part.		N/A

Attachment No.2

AS 60598.2.22:2019			
Clause	Requirement + Test	Result - Remark	Verdict

APPENDIX ZZ	**VARIATIONS TO IEC 60598-2-22:2017 (Ed. 4.1) FOR AUSTRALIA**	P
ZZ1	Scope Variations to IEC 60598-2-22:2017 (ED. 4.1) form the Australian variations for the purposes of the IECEE CB Scheme for recognition of testing to standards for safety of electrical equipment.	P
ZZ2	Variations The following modifications are required for Australian conditions:	P
22.1	After fourth paragraph, *add* the following: This part also includes relevant requirements and tests for control gears, as specified in the relevant parts of the AS/NZS 61347 series that incorporate additional facilities such as remote control devices, indicators, changeover devices, etc. Appendix ZA specifies batteries for emergency luminaires. Appendix ZC specifies luminance measurements for illuminated emergency exit signage. NOTE: Appendix ZB provides classifications for emergency luminaires	—
22.2	After first paragraph, *add* the following: The Australian or Australian/New Zealand Standards listed below are adoptions of, and not equivalent to, IEC normative references and are required for the application of this Standard. All references in the source text to those IEC normative references shall be replaced by references to the corresponding Australian or Australian/New Zealand Standards. Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. 1 *Delete* 'IEC 60155, *Glow-starters for fluorescent lamps*' and *replace* with the following: AS 60155, *Glow-starters for fluorescent lamps (IEC 60155:1993(ED. 4.0), MOD)* 2 *Delete* 'IEC 60598-1, *Luminaries — Part 1: General requirements and tests*' and *replace* with the following: AS/NZS 60598.1, *Luminaires, Part 1: General requirements and tests (IEC 60598-1, Ed. 8.0 (2014) MOD)* 3 After 'AS/NZS 60598.1*, Luminaires*, *Part 1: General requirements and tests (IEC 60598-1, Ed. 8.0 (2014) MOD)*', *add* the following: IEC 60896-22, *Stationary lead-acid batteries — Part 22: Valve regulated types — Requirements* 4 *Delete* 'IEC 61347-2-3, *Lamp control gear — Part 2-3: Particular requirements for a.c. and/or d.c. supplied electronic control gear for fluorescent lamps*' and *replace* with the following: AS/NZS 61347-2-3, *Lamp control gear, Part 2.3 — Particular requirements for a.c. and/or d.c. supplied electronic control gear for fluorescent lamps (IEC 61347-2-3, Ed. 2.0 (2011) MOD)* 5 *Delete* 'IEC 61347-2-7, *Lamp controlgear — Part 2-7: Particular requirements for battery supplied electronic controlgear for emergency lighting (self-contained)*' and *replace* with the following: AS 61347.2.7, *Lamp controlgear, Part 2-7: Particular requirements for*	—

Attachment No.2

AS 60598.2.22:2019			
Clause	Requirement + Test	Result - Remark	Verdict
	battery supplied electronic controlgear for emergency lighting (selfcontained). 6 *Delete* '*IEC 61347-2-13, Lamp controlgear — Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules*' and *replace* with the following: AS 61347.2.13, *Lamp controlgear, Part 2.13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules (IEC 61347-2-13:2016 (ED. 2.1) MOD)* 7 After 'AS 61347.2.13, *Lamp controlgear, Part 2.13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules (IEC 61347-2-13:2016 (ED. 2.1) MOD)*', *add* the following: AS/NZS 2293.3, *Emergency lighting and exit signs for buildings, Part 3: Emergency luminaires and exit signs* 8 After 'IEC 62034, *Automatic test systems for battery powered emergency escape lighting*', *add* the following: IEC 62133, *Secondary cells and batteries containing alkaline or other non-acid electrolytes — Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications* IEC 62620, *Secondary cells and batteries containing alkaline or other non-acid electrolytes — Secondary lithium cells and batteries for use in industrial applications*		
22.3	*Delete* text and *replace* with the following: Where the term 'lamp' is used in this Standard this will include all electric light sources. For the purposes of this document, the terms and definitions given in IEC 60598-1 as well as the following apply:		—
22.3.1	*Delete* 'lighting and standby lighting', and *replace* with 'lighting, standby lighting and illuminated emergency exit signs'.		—
22.3.1.101 (new)	After Clause 22.3.1, insert the following: 22.3.1.101 illuminated emergency exit signage those parts of an emergency lighting scheme intended to communicate the path of travel to a required exit by displaying appropriate images Note 1 to entry: In this Standard, the term 'exit sign' denotes 'illuminated emergency exit signage'. Note 2 to entry: In Australia, refer to AS/NZS 2293.3 for details of images.		—
22.3.14	Delete term and definition.		—
22.3.15	Delete term and definition and replace with the following: rated duration of emergency operation minimum duration time of emergency mode as stated by the manufacturer		—
22.3.18	After definition, add the following: Note 1 to entry: Rest and inhibition modes are not specified in AS/NZS 2293.3.		—
22.4	Delete fifth paragraph.		—

Attachment No.2

AS 60598.2.22:2019			
Clause	Requirement + Test	Result - Remark	Verdict
22.5	1 Delete second paragraph and replace with the following: Emergency luminaires may also be classified as specified in Annex B. 2 After clause, add the following: NOTE 1: Emergency lighting luminaires are further classified in the AS/NZS 2293 series. NOTE 2: Additional spacing classifications are given in AS/NZS 2293.3.		P
22.6.7	After the first paragraph, *insert* the following: Alternatively, the battery and luminaire shall be marked with manufacturer's name brand or trademark. Part number(s) shall be marked on or within the luminaire and be clearly visible during battery installation. The battery shall be marked with the relevant details to allow replacement. NOTE: The alternate battery marking is to cover batteries with electronic components built in or with explicit battery management requirements.		P
22.6.15	*Delete* clause.		—
22.6.17	*Delete* text and *replace* with the following: The marking required by Clause 22.6.20 shall be in a position such that the information can be seen when the luminaire has been installed. The marking in Clauses 22.6.1, 22.6.2, 22.6.5, 22.6.7 and 22.6.9 shall be visible during the maintenance of the relevant component.		P
22.6.20	*Delete* text and *replace* with the following: Emergency luminaires mounted on lighting track systems, or other adjustable or aimed luminaires, shall be marked to indicate that they are an emergency luminaire and shall not be adjusted by unauthorised persons.		N/A
22.6.101 (New)	After Clause 22.6.21, *add* the following: **22.6.101** The marking and instructions shall contain the substance of the following: **WARNING: ALL MAINTENANCE, SUCH AS BATTERY CHANGE ON THIS LUMINAIRE, TO BE PERFORMED BY QUALIFIED PERSONNEL ONLY.** **DE-ENERGISE ALL SUPPLIES BEFORE MAINTENANCE.** The marking shall be visible on the outside of the luminaire or behind the cover or part which is removed during installation or maintenance.		P

Attachment No.2

AS 60598.2.22:2019			
Clause	Requirement + Test	Result - Remark	Verdict
22.7.	*Delete* text and *replace* with the following: The provisions of Section 4 of AS/NZS 60598.1 shall apply together with the requirements of Clause 22.7.1 to Clause 22.7.25 below. NOTE: In Australia, performance requirements of automatic test systems are given in AS/NZS 2293.1 and AS/NZS 2293.3.		P
22.7.7	*Delete* text and *replace* with the following: Self-contained emergency luminaires shall have, adjacent to them or incorporated in them, a device for charging the battery from the normal supply and an indicator, e.g. a lamp. For all emergency luminaires, conformance that the charge indicator is correctly connected to the circuit is checked by disconnecting the battery during the charging phase, causing the indicator to extinguish or change colour. Any parts of this indicator lamp that are external or can be touched after covers are removed to access a momentary action switch designed for pressing during normal operation, shall be separated from supply voltage by double or reinforced insulation. Conformance is checked by test and inspection or reference to AS 61347.2.7 if checked there.		P
22.7.8	*Delete* clause.		—
22.7.10	*Delete* note and *insert* the following: This does not preclude the use of momentary action switch, which if installed shall not expose the user to unsafe voltages. This switch shall not be located in a situation where hazardous voltages are accessible. NOTE: Such a switch is intended for pressing during normal operation (240 V) and usually used to check function of emergency operation mode		P
22.7.12	*Delete* 'NiMH' and *insert* 'NiMH or Li alloy'.		—
22.7.21	*Delete* clause.		—
22.7.22	*Delete* clause.		—
22.7.101 (New)	After Clause 22.7.23 note, *add* the following: **22.7.101** Clause 4.2 of AS/NZS 60598.1 does not apply to batteries as they are not determined to be user serviceable items.		N/A

Attachment No.2

AS 60598.2.22:2019			
Clause	Requirement + Test	Result - Remark	Verdict
22.12	*Delete* text and *replace* with the following: The provisions of Section 8 of AS/NZS 60598.1 shall apply, with the exception that access to basic insulation is now allowed during maintenance, including access to the test switch where non-replaceable light sources are used and warnings given. The cover is removed if a momentary action switch is intended to be pressed in normal operation. NOTE: See Clause 22.7.7 regarding the charge indicator.		P
22.13.4	*Delete* text and *replace* with the following: For the purposes of Clause 22.13.3, additional minimum battery voltage limits apply. Voltage limits for discharge durations in Table 1 shall be used unless otherwise specified by the battery cell manufacturer. **Table 1 — Voltage limits for discharge durations up to the end of declared battery life**		P
22.13.5	*Delete* text and *replace* with the following: The maximum temperature of the outer casing of a battery shall be measured. The maximum temperature shall not exceed the battery manufacturer's stated maximum temperature rating. Where there is no battery manufacturer rating supplied, then the maximum temperature allowed shall be 40 °C for lead acid and Li(NiCoMn)O2 and 55 °C for NiCd, LiFePO4 and other battery technologies.		P

Battery type	Discharge conditions	
	Up to 1 h duration V/cell	Greater than 1 duration V/cell
Nickel cadmium	1.0	1.0
Lead acid	1.75	1.80
Nickel metal hydride	1.0	1.0
$Li(NiCoMn)O_2$	3	3
$LiFePO_4$	2	2
NOTE: The values given apply at an ambient temperature of 20°C ± 5°C.		

For other battery types, the battery manufacturer's data shall be used.

Attachment No.2

AS 60598.2.22:2019			
Clause	Requirement + Test	Result - Remark	Verdict
22.13.7	*Delete* text and *replace* with the following: On completion of the endurance test, after having completed a battery discharge in accordance with Clause 22.13.4, a self-contained emergency luminaire shal be allowed to cool to its rated ambient temperature (*t*a) or to 25 °C, whichever is the higher. The self-contained emergency luminaire shall then be charged for 24 h at 0.9 times rated supply voltage. The supply to the luminaire shall then be disconnected. The luminaire as tested shall then operate in the emergency mode.		P
22.13.101 (New)	After Clause 22.13.7, *add* the following: **22.13.101** Functional safety shall conform with the relevant requirements of AS/NZS 2293.3.		P
22.14	*Delete* text and *replace* with the following: The provisions of Section 9 of AS/NZS 60598.1 shall apply. For luminaires with IP classification greater than IP20, the order of tests specified in Section 9 of AS/NZS 60598.1 shall be as specified in Clause 22.13 of this Standard.		N/A
22.16	1 Second paragraph, *delete* 'or the leads from the charger to the battery or charger circuit,'. 2 *Delete* third paragraph. 3 *Delete* fourth paragraph		P
22.17	*Delete* clause and *replace* with the following: **22.17 Photometric data** Photometric data shall be provided and performed in accordance with Appendix C of AS/NZS 2293.3.		P
22.19	First paragraph, *delete* 'at least half of the rated duration' and *replace* with 'at least 30 minutes'.		P
22.21	First paragraph, *delete* 'Self-contained emergency luminaires shall be provided with:' and *replace* with the following: Test devices for emergency operation shall be in accordance with AS/NZS 2293.1 and AS/NZS 2293.3 or the following clauses. Self-contained emergency luminaires shall be provided with:		P
Annex A	*Delete* annex and *replace* with the following: **Appendix ZA** (normative) **Batteries for emergency luminaires** Batteries incorporated in emergency luminaires shall be one of the following types: (a) Sealed nickel cadmium. (b) Valve regulated lead acid. (c) Sealed nickel metal hydride. (d) Lithium battery.		P

Attachment No.2

AS 60598.2.22:2019			
Clause	Requirement + Test	Result - Remark	Verdict
	Sealed nickel cadmium batteries shall conform to IEC 61951-1 for cells intended for permanent charge at elevated temperatures. Valve regulated lead acid batteries shall conform to IEC 60896-22. Sealed nickel metal hydride batteries shall conform to IEC 61951-2 for cells intended for permanent charge at elevated temperatures. Lithium batteries shall conform with IEC 62620 and IEC 62133. NOTE: Other battery types may be allowed provided they conform to their relevant safety and performance standards and the relevant requirements of this Standard. All batteries shall conform with the relevant requirements of AS/NZS 61347.2.7. NOTE: See Appendix ZB for emergency luminaire classifications.		
Annex B	*Delete* annex and *replace* with the following: **Appendix ZB** (informative) **Luminaire classification** Emergency luminaires should be classified and marked in accordance with their construction as follows. A unique designation denoting the type, mode of operation, the facilities included and the rated duration of the luminaire should be clearly affixed to the luminaire. **Instruction/New text** The designation consists of a rectangle, divided in three or four segments, each containing one or more positions. Relevant to the construction, a position will consist of a letter or a figure, or a point if no indication is required to be given. The shape of the emergency luminaire designation is as follows: | * | * | ******* | *** | The segments and positions should be completed by letters and figures indicating the intended constructions as identified in the following list: (a) First segment containing one character: Type X self-contained Z central supply	See rating label	P

Attachment No.2

AS 60598.2.22:2019			
Clause	Requirement + Test	Result - Remark	Verdict

(b) Second segment containing one digit: Mode of operation
0 non-maintained
1 maintained
2 combined non-maintained
3 combined maintained
4 compound non-maintained
5 compound maintained
6 satellite
(c) Third segment containing a possible seven characters: Facilities. To be
completed where appropriate at the time of installation
A including test device
B including remote rest mode
C including inhibiting mode
D high-risk task-area luminaire
E with non-replaceable lamp(s) and/or battery
F automatic test gear conforming with IEC 61347-2-7 denoted EL-T
G internally illuminated safety sign.
(d) Fourth segment containing up to three digits: For self-contained
luminaires to indicate the minimum in service duration of the emergency
mode expressed in minutes, e.g.:
10 to indicate 10 min duration
60 to indicate 1 h duration
90 to indicate 1.5 h duration (In Australia the 1.33 test factor results in a
2 h initial type test duration)
120 to indicate 2 h duration
180 to indicate 3 h duration
240 to indicate 4 h duration
The following two examples of marking are given to explain the method of using the coding:

X	1	BD	90

Meaning: Self-contained, maintained luminaire to be discarded at end of life and
having an emergency mode duration of 240 min (commonly used value in
Australia for lifts, mines and tunnels).

Z	1	F	

Meaning: Centrally supplied, maintained luminaire with automatic test function
having an emergency mode duration that will be defined by the emergency
power supply used in the installation.

Attachment No.2

AS 60598.2.22:2019			
Clause	Requirement + Test	Result - Remark	Verdict
Annex C	*Delete* annex and *replace* with the following: **Appendix ZC** (normative) **Luminance measurements** The luminance measurements of illuminated emergency exit signage shall conform with Section 3 of AS/NZS 2293.3.		P
Bibliography	After first entry, add the following: AS/NZS 2293.1, Emergency escape lighting and exit signs for buildings, Part 1: System design, installation and operation		P

Attachment No.3

IEC 62031

LED modules for general lighting - Safety specifications

Clause	Requirement + Test	Result - Remark	Verdict
	Tests according to IEC 62031: 2018		
12 (14)	**FAULT CONDITIONS**		**P**
- (14.1)	When operated under fault conditions the controlgear:		N/A
	- does not emit flames or molten material		N/A
	- does not produce flammable gases		N/A
	- protection against accidental contact not impaired		N/A
	Thermally protected controlgear does not exceed the marked temperature value		N/A
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	N/A
- (14.2)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (after any reduction in 14.2 - 14.5)	(see appended table)	N/A
- (14.3)	Short-circuit or interruption of semiconductor devices	(see appended table)	N/A
- (14.4)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	N/A
- (14.5)	Short-circuit across electrolytic capacitors	(see appended table)	N/A
	Short-circuit or interruption of SPDs	(see appended table)	N/A
- (14.6)	After the tests has been carried out on three samples:		N/A
	The insulation resistance ≥ 1 MΩ ..... :		N/A
	No flammable gases		N/A
	No accessible parts have become live		N/A
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		N/A
- (14.7)	Relevant fault condition tests with high-power a.c. supply and in turn to a d.c. supply		—
12.2	**Overpower condition**		**P**
	Module withstands overpower condition >15 min.		P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		N/A
	No fire, smoke or flammable gas is produced		P
	Molten material does not ignite tissue paper, spread below the module		P

Attachment No.4

IEC TR 62778 Spectroradiometric measurement			
Clause	Requirement + Test	Result - Remark	Verdict

	Spectroradiometric measurement (IEC TR 62778:2014)		**P**
	Measurement performed on:	**Luminaire**	--
	Model number.....:	DS-ES-04M	--
	Test voltage (V).....:	240VAC	--
	Test current (mA).....:	--	--
	Test frequency (Hz).....:	--	--
	Ambient, t (°C).....:	25,0	--
	Measurement distance.....:	☒ 20 cm ☐ ... cm	--
	Source size .....:	☒ Non-small ☐ Small : .... mm	--
	Field of view .....:	☐ 100 mrad ☒ 11 mrad ☐ 1,7 mrad (for small sources)	--

Item	Symbol	Units	Result	Risk Group
Correlated colour temperature	CCT	K	--	--
x/y colour coordinates	--	--	--	--
Blue light hazard radiance	L_B	$W/(m^2 \cdot sr^1)$	<1.0	☒ RG0: <100 ☐ RG1: <10000 ☐ RG2: <4000000
Blue light hazard irradiance	E_B	W/m^2	--	--
Luminance	L	cd/m^2	--	--
Illuminance	E	lx	--	--
Supplementary information:				

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict

4 (4)	**GENERAL REQUIREMENTS**		**P**
- (4)	Insulation materials for double or reinforced insulation according requ irements in Annex N of IEC 61347-1	(see Annex N)	N/A
- (4)	Compliance of independent controlgear enclosure with IEC 60598- 1		N/A
- (4)	Built-in magnetic ballast with double or reinforced insulation comply with Annex I of IEC 61347-1		N/A
- (4)	Built-in electronic controlgear with double or reinforced insulation comply with Annex O of IEC 61347-1	(see Annex O)	N/A
- (4)	SELV controlgear comply with Annex L of IEC 61347-1	(see Annex L)	P
4 (-)	Each lamp type tested according clause 15 – 20, 22 and 34 and lamp with highest rated power in other tests		—
4 (-)	Controlgear with automatic test function tested according Annex K	(see Annex K)(for automatic test function.)	P

6 (6)	**CLASSIFICATION**		**P**
	Built-in controlgear ..... :	Yes☐ No☒	—
	Independent controlgear..... :	Yes☐ No☒	—
	Integral controlgear ..... :	Yes☒ No☐	—
	With automatic test function .....:	Yes☐ No☒	—

7 (7)	**MARKING**		**N/A**
7.1 (7.1)	Mandatory markings		N/A
	a) mark of origin		N/A
	b) model number or type reference		N/A
	c) symbol for independent controlgear, if applicable		N/A
	d) correlation between interchangeable parts and controlgear marked		N/A

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
	e) rated supply voltage (V)		N/A
	supply frequency (Hz)		N/A
	supply current (A)		N/A
	f) earthing symbol		N/A
	k) wiring diagram		N/A
	l) value of t_c		N/A
7.1 (-)	- open circuit voltage (V)		N/A
	- controlgear without enclosure marked with a) and b) above		N/A
	- type and current rating of fuse, if applicable		N/A
	- symbol if the controlgear comply with this part 2	EL	N/A
	- symbol if the controlgear is provided with automatic test function	EL-T	N/A
	- maximum working voltage between output terminals (V)		N/A
	- maximum working voltage between any output terminal and earth, if applicable (V)		N/A
7.1 (7.2)	Marking durable and legible		N/A
	Rubbing 15 s water, 15 s petroleum; marking legible		N/A
7.2 (7.1)	Information to be provided, if applicable:		N/A
	h) declaration on protection against accidental contact		N/A
	i) cross-section of conductors (mm²)		N/A
	j) number, type and wattage of lamp(s)		N/A
	n) additional heat sink		N/A
	- suitable for use only on battery supply not having a trickle or intermittent re-charging circuits		N/A
	- rated duration of operation (hr)		N/A
	- for use in luminaries for high-risk task area lighting		N/A
	- proof against supply voltage polarity reversal		N/A
	- emergency ballast lumen factor (EBLF)		N/A
	- limits of ambient temperature range within which the ballast will start and operate		N/A

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
	- type of insulation between the supply and the battery circuit (non, basic or double/reinforced)		N/A
	- recharge the battery normally after the test of 22.3		N/A
	- supply current for each lamp		N/A
	Information for correct battery selection:		N/A
	- technology of the battery		N/A
	- type designation		N/A
	- capacity		N/A
	- voltage		N/A
	- maximum charge current		N/A
	- minimum charge current		N/A
	- charge voltage limits		N/A
	- maximum discharge current		N/A
	- minimum discharge current		N/A
	- discharge voltage limits		N/A
	- temperature rating		N/A
	- type and manufacturer		N/A
	- information regarding the installation, commissioning and use if with automatic test function		N/A
8 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		**P**
- (10.1)	Controlgear protected against accidental contact with live parts	Rely on the enclosure of luminaire	N/A
- (A2)	Voltage measured with 50 kΩ		N/A
- (A3)	Voltage > 35 V peak or > 60 V d.c. or protective impendence device	(see Annex A)	N/A
- (10.1)	Lacquer or enamel not used for protection or insulation		N/A
	Adequate mechanical strength on parts providing protection		N/A
- (10.2)	Capacitors > 0,5 µF: voltage after 1 min (V): < 50 V ..... :	4V	P
- (10.3)	Controlgear providing SELV		P

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
	Accessible conductive parts are insulated from live parts by double or reinforced insulation in SELV controlgear		P
	No connection between output circuit and the body or protective earthing circuit		N/A
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		N/A
	SELV outputs separated by at least basic insulation		P
	ELV conductive parts insulated as live parts		P
	Tests according Annex L of IEC 61347-1		P
- (10.4)	Accessible conductive parts in SELV circuits		P
	Output voltage under load ≤ 25 V r.m.s. or ≤ 60 V d.c.		P
	If output voltage > 25 V r.m.s. or > 60 V d.c.; No load output ≤ 35 V peak or ≤ 60 V d.c and touch current does not exceed 0,7 mA (peak) or 2 mA d.c. ..... :	--	N/A
	One conductive part is insulated if output voltage or current exceeding the values above and withstand test voltage 500 V		N/A
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor	Y1 type capacitor	P
	Y1 or Y2 capacitors comply with IEC 60384-14		P
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A
9 (8)	**TERMINALS**		N/A
- (8)	Screw terminals according section 14 of IEC 60598-1:		N/A
	Separately approved; component list	(see Annex 1)	N/A
	Part of the controlgear	(see Annex 2)	N/A

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
	Screwless terminals according section 15 of IEC 60598-1:		N/A
	Separately approved; component list	(see Annex 1)	N/A
	Part of the controlgear	(see Annex 3)	N/A
10 (9)	**PROVISION FOR PROTECTIVE EARTHING**		**N/A**
- (9.1)	Provisions for protective earthing		N/A
	Terminal complying with clause 9		N/A
	Locked against loosening and not possible to loosen by hand		N/A
	Not possible to loosen clamping means unintentionally on screwless terminals		N/A
	Earthing via means of fixing		N/A
	Earthing terminal only used for the earthing of the control gear		N/A
	All parts of material minimizing the danger of electrolytic corrosion		N/A
	Made of brass or equivalent material		N/A
	Contact surface bare metal		N/A
- (9.2)	Provision for functional earthing		N/A
	Comply with clause 8 and 9.1		N/A
- (9.3)	Earth contact via the track on the printed board		N/A
	Test with a current of 25 A between earthing terminal and each of the accessible metal parts; measured resistance (Ω) at ≥ 10 A according 7.2.3 of IEC 60598-1: < 0,5 Ω ..... :		N/A
- (9.4)	Earthing of built-in lamp controlgear		N/A
	Earth by means of fixing to earthed metal of luminaire in compliance of 7.2 of IEC 60598-1		N/A
	Earthing terminal only for earthing the built-in controlgear		N/A
- (9.5)	Earthing via independent controlgear		N/A
- (9.5.1)	Earth connection to other equipment		N/A
	Looping or through connection, conductor min. 1,5 mm² and of copper or equivalent		N/A

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
	Protective earthing wires in line with 5.3.1.1 and clause 7		N/A
- (9.5.2)	Earthing of the lamp compartments powered via the independent lamp controlgear		N/A
	Test with a current of 25 A between input and output earth terminals; measured resistance (Ω) between earthing terminal and each of the accessible metal parts at ≥ 10 A according 7.2.3 of IEC 60598-1: < 0,5 Ω ..... :	--	N/A
	Output earthing terminal marked as in 7.1 t) of IEC 61347-1		N/A
11 (11)	**MOISTURE RESISTANCE AND INSULATION**		**P**
	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 ..... :	>100MΩ	P
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		P
12 (12)	**ELECTRIC STRENGTH**		**P**
	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		N/A
	Working voltage > 50 V ≤1000 V, test voltage (V):		P
	Basic insulation, 2U + 1000 V	1480V	P
	Supplementary insulation, 2U + 1000 V		N/A
	Double or reinforced insulation, 4U + 2000 V	2960V	P
	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/A

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
15 (-)	**STARTING CONDITIONS**		**P**
	- after the switching test the ballast operate the lamps at rated operating voltage		P
	- the lamps start and operate from the appropriate mains operation reference ballast/circuit		P
16 (-)	**LAMP CURRENT** (only for fluorescent lamps)		N/A
	Lamp current not exceeding 125 % of that delivered to the same lamp when operated with a reference controlgear		N/A
17 (-)	**SUPPLY CURRENT**		**P**
	At the rated operating voltage, the supply current from the battery differ not more than ± 15 % from the marked value when operated with reference lamp		P
18 (-)	**MAXIMUM CURRENT IN ANY LEAD (WITH CATHODE PREHEATING)**		N/A
	If fluorescent lamp, the current flowing in any cathode termination not exceed the value given in lamp data sheet of IEC 60081 and IEC 60901	(see appended table)	N/A
19 (-)	**LAMP OPERATING CURRENT WAVEFORMS** (only for fluorescent lamps)		N/A
	The peak current does not exceed 1,7 times the rated lamp current specified on lamp data sheets of IEC 60081 and IEC 60901 .....:	--	N/A
	The peak current does not exceed 3 times the measured r.m.s. lamp current ..... :	--	N/A
20 (-)	**FUNCTIONAL SAFETY (EBLF, EOF_X)**		**P**
20.1	**Requirements for fluorescent lamp controlgear**		N/A
	The controlgear provide the necessary light output after change over to the emergency mode		N/A

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
	- lowest value measured at 60 s and V_1 or in steady conditions at V_{min} be retained and reach at least the declared EBLF .....:	--	N/A
	- value measured at 5 s and V_1 reach at reach least 50 % of declared EBLF .....:	--	N/A
	- controlgear declared for high-risk task area lighting, lowest value measured at 0,5 s and V_1 or in steady conditions at V_{min} be retained and reach at least the declared EBLF .....:	--	N/A
20.2	**Requirements for LED lamp controlgear**		**P**
20.2.1	Constant current LED controlgear: EOF_l and $I_{emergency}$		P
	- lowest value measured at 60 s and V_1 or V_{min} retained and reach at least the declared $I_{emergency}$ and EOF_l.....:	0.249A	P
	- value measured at 5 s and V_1 reach at least 50 % of current $I_{emergency}$ .....:	0.249A	P
	- controlgear declared for high-risk task area lighting, lowest value measured at 0,5 s and V_1 retained and reach at least the declared $I_{emergency}$ and EOF_l.....:		N/A

21 (-)	**CHANGE-OVER OPERATION**		**P**
	Change over from normal to emergency mode at not less than 0,6 times and not greater than 0,85 times rated supply voltage		P
	Change over voltage (V)..... :	150.5V (From normal model to emergency mode)	P
	Supply reduced within 0,5 s to 0,6 times rated voltage, emergency lamps operated		P
	Switching of supply at 0,85 times rated voltage for 500 cycles 2 s ″off″ and 2 s ″on″. After these cycles, supply reduced to 0,6 times rated voltage. Emergency lamps operated during emergency mode and after the test.		P

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
	Controlgear with rest mode: automatic changeover from rest mode to normal mode at not greater than 0.9 times rated supply voltage		N/A
22 (-)	**RECHARGING DEVICE**		**P**
	Recharging device provide the rated charge performance specified by the battery manufacturer to charge the battery within 24 h		P
	Transformers in the recharging device comply with relevant parts of IEC 61558-2-1, IEC 61558-2-6 and IEC 61558-2-16		P
22.1 (-)	Low temperature operation		P
	Charged battery for 48 h and then discharged until voltage indicated in table 2 is achieved at 20 °C ± 5 °C		P
	Charged battery at 0,9 times rated supply voltage at minimum ambient temperature for 24 h		P
	Simulating supply failure, lamp operated for rated duration of operation and at the end the battery voltage is at least V_{min} according clause 20		P
22.2 (-)	High temperature operation		P
	Charged battery for 48 h and then discharged until voltage indicated in table 2 is achieved at 20 °C ± 5 °C		P
	Charged at 0,9 times rated supply voltage at maximum ambient temperature for 24 h		P
	Simulating supply failure, lamp operated for rated duration of operation and at the end the battery voltage is at least V_{min} according clause 20		P
22.3 (-)	Abnormal operating condition		P
	Recharging device operated at 1,1 times rated supply voltage and maximum marked ambient temperature with battery disconnected and output short-circuited		P
	- no flames, molten material or flammable gases		P

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
	After the test period and short-circuit removed		P
	- the recharging device is safe		P
	- normal recharge if self-resetting or user-replaceable protective devices		P
22.4 (-)	Maximum output voltage		P
	Output voltage of recharging device ≤ 50 V r.m.s. at 1,1 times rated supply voltage with or without batteries connected (V)..... :	Max. 6.72Vdc	P
22.5 (-)	Battery charge and discharge characteristics		P
	Charged battery for 48 h and then discharged until voltage indicated in table 2 is achieved at 20 °C ± 5 °C		P
	Charged at 0,9 and 1,1 times rated supply voltage at 25 °C ± 2 °C for 24 h		P
	Current and voltage characteristics within those declared by controlgear manufacturer		P
22.6 (-)	Lamp failure		P
	Lamp failure do not interrupt charging current to battery and not impair the operation of the battery		P
23 (-)	**PROTECTION AGAINST EXCESSIVE DISCHARGE**		**P**
	Protection against polarity reversal of individual cells, limits the discharge current when the battery voltage has fallen to V_{low} according a) to c)		P
	- Discharge current (A) ..... :	0.0001	P
	Protection system prevents any further discharge until the normal supply has been restored. Battery voltage not below V_{low} and discharge current not exceed a) to c)		P
	- Battery voltage (V) ..... :	6.55V	P
	- Discharge current (A) ..... :	0.341A	P
24 (-)	**INDICATOR**		**P**
	Compliance with 22.6.7 of IEC 60598-2-22		P

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
25 (-)	**REMOTE CONTROL, REST MODE, INHIBITION MODE**		N/A
25.1 (-)	No other changeover device than the switch between the battery and emergency lighting lamps		N/A
	Not contain manual or non-self-resetting switch isolating the emergency circuit from main supply		N/A
25.2 (-)	If rest mode facility, operation automatically revert to normal mode if restoration of normal supply		N/A
	If remote inhibiting facilities, provided with a means of connection to the remote inhibiting circuit		N/A
25.3 (-)	If for remote inhibiting facilities, in the emergency mode, not influenced by short circuit or contact to earth in the wiring to the remote control		N/A
	- Simulation of above faults in conjunction with tests of 28.2		N/A
25.4 (-)	Operation of remote control independent of the battery and mains supply		N/A
25.5 (-)	If rest mode facility in the emergency mode , not influenced by short circuit, contact to earth or interruption in the wiring to the remote control changeover device		N/A
	- Simulation of above faults in conjunction with tests of 28.2		N/A
25.6 (-)	If rest mode or inhibiting facilities, in rest mode, current drain from batteries not exceed the values in 25.6		N/A
	- Discharge current (A) ..... :	--	N/A
26 (-)	**TEMPERATURE CYCLING TEST AND ENDURANCE TEST**		P
26.a (-)	Temperature cycling test: 5 cycles;		P
	- 1 h at minimum ambient temperature (°C) ..... :	0	P
	- 1 h at maximum ambient temperature (°C) ..... :	40	P
26.b (-)	Endurance test 50 h at an ambient that produces tc; ambient temperature (°C) ..... :	40	P
	After test, controlgear restart and operate lamps at rated operating voltage		P

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
27 (-)	**POLARITY REVERSAL**		P
	If declared to be proof against polarity reversal, operating with reverse supply voltage for 1 h at maximum rated voltage		P
	After test, supply connected correctly, start and operate lamps normally		P
28 (14)	**FAULT CONDITIONS**		**P**
28.1 (14)	When operated under fault conditions the controlgear:		P
	- does not emit flames or molten material		P
	- does not produce flammable gases		P
	- protection against accidental contact not impaired		P
	Thermally protected controlgear does not exceed the marked temperature value		N/A
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	P
- (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)	P
	Creepage distances on printed boards less than specified in clause 16 in Part 1 provided with coating according to IEC 60664-3		P
- (14.2)	Short-circuit or interruption of semiconductor devices	(see appended table)	P
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	N/A
- (14.4)	Short-circuit across electrolytic capacitors	(see appended table)	P
- (14.5)	After the tests has been carried out on three samples:		P
	The insulation resistance ≥ 1 MΩ ..... :	>100MΩ	P
	No flammable gases		P
	No accessible parts have become live		P

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P
- (14.6)	Relevant fault condition tests with high-power supply		—
28.2 (-)	Short circuit, contact to earth or interruption in the wiring of the normal supply not influenced the emergency mode		P
29 (15)	**CONSTRUCTION**		**P**
- (15.1)	Wood, cotton, silk, paper and similar fibrous material		P
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
- (15.2)	Printed circuits		P
	Printed circuits used as internal connections complies with clause 14		P
- (15.3)	Plugs and socket-outlets used in SELV or ELV circuits		N/A
	No dangerous compatibility between output socket-outlet and a plug for socket-outlets for input circuit in relation to installation rules, voltages and frequencies		N/A
	Plugs and socket-outlets for SELV comply with IEC 60906-3 and IEC 60884-2-4		N/A
	Plugs and socket-outlets for SELV ≤ 3 A, ≤ 25 V r.m.s. or ≤ 60 V d.c. and ≤ 72 W comply with IEC 60906-3 and IEC 60884-2-4 or:		N/A
	- plugs not able to enter socket-outlets of other standardised system		N/A
	- socket-outlets not admit plugs of other standardised system		N/A
	- socket-outlets without protective earth		N/A
29.1.1 (-)	Compliance with 22.6.1, 22.6.7, 22.6.9, 22.6.11, 22.6.19 and 22.20 of IEC 60598-2-22 if applicable		P
29.1.2 (-)	Battery comply with Annex I		P
	Battery designed for at least 4 years of operation		P
	Battery only use for emergency functions		P

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
30 (16)	**CREEPAGE DISTANCES AND CLEARANCES**		**P**
- (16.1)	**General**		P
- (16)	Creepage distances and clearances according to 16.2 and 16.3		P
	Controlgears providing SELV comply with additional requirements in Annex L	(see Annex L)	P
	Insulating lining of metallic enclosures		N/A
	Controlgear protected against pollution comply with Annex P	(see Annex P)	N/A
- (16.2)	**Creepage distances**		P
- (16.2.2)	Minimum creepage distances for working voltages		P
	Creepage distances according to Table 7	(see appended table)	P
- (16.2.3)	Creepage distances for working voltages with frequencies above 30 kHz		N/A
	Creepage distances according to Table 8	(see appended table)	N/A
- (16.3)	**Clearances**		P
- (16.3.2)	Clearances for working voltages		P
	Clearances distances according to Table 9	(see appended table)	P
- (16.3.3)	Clearances for ignition voltages and working voltages with higher frequencies		N/A
	Clearances distances for basic or supplementary insulation according to Table 10	(see appended table)	N/A
	Clearances distances for reinforced insulation according to Table 11	(see appended table)	N/A

31 (17)	**SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS**		P
	Screws, current-carrying parts and connections in compliance with IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1)		P
(4.11)	Electrical connections		P
(4.11.1)	Contact pressure		P
(4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
(4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
(4.11.4)	Material of current-carrying parts		P
(4.11.5)	No contact to wood or mounting surface		P
(4.11.6)	Electro-mechanical contact systems		N/A
(4.12)	Mechanical connections and glands		N/A
(4.12.1)	Screws not made of soft metal		N/A
	Screws of insulating material		N/A
	Torque test: torque (Nm); part.....:		N/A
	Torque test: torque (Nm); part.....:	--	N/A
	Torque test: torque (Nm); part.....:	--	N/A
(4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
(4.12.4)	Locked connections:		N/A
	- fixed arms; torque (Nm)..... :	--	N/A
	- lampholder; torque (Nm).....:	--	N/A
	- push-button switches; torque 0,8 Nm..... :	--	N/A
(4.12.5)	Screwed glands; force (Nm)..... :	--	N/A
32 (18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		**P**
- (18.1)	Ball-pressure test .....:	See IEC60598-2-22 part	P
- (18.2)	Test of printed boards .....:	See IEC60598-2-22 part	P
- (18.3)	Glow- wire test .....:	See IEC60598-2-22 part	P
- (18.4)	Needle flame test .....:	See IEC60598-2-22 part	P
- (18.5)	Tracking test .....:	See Test Table 22.16	N/A
33 (19)	**RESISTANCE TO CORROSION**		N/A
	- test according 4.18.1 of IEC 60598-1		N/A
	- adequate varnish on the outer surface		N/A
34	**Abnormal lamp conditions**		P
34.1	Controlgear not impair safety operated under abnormal conditions		P
34.2	Abnormal conditions for controlgear for fluorescent lamps		N/A
	a) lamp not inserted		N/A
	b) lamp does not start because cathode is broken		N/A
	c) de-active lamp		N/A

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
	d) lamp operates with rectifying effect		N/A
34.3	Abnormal conditions for d.c. supplied electronic step-down convertors for filament lamps		N/A
	Output voltage of the convertor not exceed 115% of rated output voltage under abnormal conditions		N/A
	a) lamp not inserted		N/A
	b) twice the number of lamps		N/A
	c) output terminals short-circuited		N/A
34.4	Abnormal conditions for controlgear for d.c. supplied electronic controlgear for LED modules		P
34.4.1	Length of output cable 20 cm and 200 cm in 34.4.2 or 34.4.3		P
34.4.2	Controlgear of constant voltage type		N/A
	a) no LED module inserted		N/A
	b) double LED modules in parallel		N/A
	c) output terminals short-circuited		N/A
34.4.3	Controlgear of constant current type		P
	a) no LED module inserted (and all at same time)		P
	b) double LED modules in series		P
	c) output terminals short-circuited		P
34.5	Abnormal conditions for ballast for d.c. supplied electronic controlgear for discharge lamps		N/A
	a) lamp not inserted or does not ignite		N/A
	b) burner leaks		N/A
	c) lamp operates, but rectifies		N/A
34.6	Compliance		P
	- does not emit flames or molten material		P
	- does not produce flammable gases		P
	- protection against accidental contact according 10.1 of IEC 61347-1 not impaired		P
	- insulation resistance ≥ 1 MΩ .....:	>100MΩ	P
35	**Protection of associated components**		**N/A**
35.1	**Controlgear for fluorescent lamps**		**N/A**
35.1.1	Peak voltage limits		N/A

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
	Voltage at output terminals not exceed maximum permitted peak value in Table 2 (V) ..... :	--	N/A
35.1.2	Working voltage limits		N/A
	Voltage at output terminals not exceed declared maximum working voltage under normal operating, and from 5 s after start (V) ..... :	--	N/A
35.1.3	Compliance		N/A
	Voltage in 35.1 and 35.2 in compliance with the limits, measured between output terminal and earth		N/A
	Voltage in 35.1 and 35.2 in compliance with the limits, measured between output terminals if the voltage present across insulation barriers within associated components		N/A

28 (14)	**TABLE: tests of fault conditions**		P
Part	Simulated fault	Test result	Hazard
C1	s-c	Fuse open, no flame, no flammable gas, no molten parts	No
C3	s-c	Fuse open, no flame, no flammable gas, no molten parts	No
U1	s-c	Fuse open, no flame, no flammable gas, no molten parts	No
T1	s-c	Fuse open, no flame, no flammable gas, no molten parts	No
C6	s-c	Shut down, recoverable, no flame, no flammable gas, no molten parts	No
IC3	s-c	Shut down, recoverable, no flame, no flammable gas, no molten parts	No
Output (+&-)	s-c	Shut down, recoverable, no flame, no flammable gas, no molten parts	No

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
A	**ANNEX A IN PART 1: TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS A LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK**		N/A
A.1	Comply with A.2 or A.3	Rely up on luminaries enclosure	N/A
A.2	Voltage ≤ 35 V peak or ≤ 60 V d.c .....:	--	N/A
A.3	If voltage > 35 V peak or > 60 V d.c. or protective impendence device; touch current does not exceed 0,7 mA (peak) or 2 mA d.c. .....:	--	N/A
	Comply with Annex G of IEC 60598-1		N/A
C	**ANNEX C IN PART 1: PARTICULAR REQUIREMENTS FOR ELECTRONIC LAMP CONTROLGEAR WITH MEANS OF PROTECTION AGAINST OVERHEATING**		N/A
C3	**GENERAL REQUIREMENTS**		N/A
C3.1	Thermal protection means integral with the controlgear, protected against mechanical damage		N/A
	Renewable only by means of a tool		N/A
	If function depending on polarity, for cord-connected equipment protection means in both leads		N/A
	Thermal links comply with IEC 60691		N/A
	Electrical controls comply with IEC 60730-2-3		N/A
C3.2	No risk of fire by breaking (clause C7)		N/A
C5	**CLASSIFICATION**		N/A
	a) automatic resetting type		—
	b) manual resetting type		—
	c) non-renewable, non-resetting type		—

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
	d) renewable, non-resetting type		—
	e) other type of thermal protection; description ...:		—
C6	**MARKING**		N/A
C6.1	Symbol for temperature declared thermally protected controlgear		N/A
C6.2	Declaration of the type of protection provided		N/A
C7	**LIMITATION OF HEATING**		N/A
C7.1	Preselection test:		N/A
	Test sample placed for at least 12 h in an oven having temperature (t_c - 5) K		N/A
	No operation of the protection device		N/A
C7.2	Functioning of protection means:		N/A
	Normal operation of the sample in a test enclosure according to Annex D at an ambient temperature such that (t_c +0; -5) °C is obtained		N/A
	No operation of the protection device		N/A
	Introducing of the most onerous test condition determined during test of clause 14		N/A
	Output of windings connected to the mains supply short-circuited, and other part of the controlgear operated under normal conditions		N/A
	Increasing of the current through the windings continuously until operation of the protection means		N/A
	Continuous measuring of the highest surface temperature		N/A
	Controlgear according to C5 a) or C5 e) operated until stable conditions are achieved		N/A
	Automatic-resetting thermal protectors working 3 times		N/A

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
	Controlgear according to C5 b) working 6 times		N/A
	Controlgear according to C5 c) and C5) d) working once		N/A
	Highest temperature does not exceed the marked value		N/A
	Any overshoot of 10% over the marked value within 15 min		N/A
D	**ANNEX D IN PART 1: REQUIREMENTS FOR CARRY OUT THE HEATING TESTS OF THERMALLY PROTECTED LAMP CONTROLGEAR**		N/A
	Tests in C7 performed in accordance with Annex D, if applicable		N/A
F	**ANNEX F IN PART 1: DRAUGHT-PROOF ENCLOSURE**		P
	Draught-proof enclosure in accordance with the description		P
	Dimensions of the enclosure		P
	Other design; description		N/A
H	**ANNEX H IN PART 1: TESTS**		P
	All tests performed in accordance with the advice given in Annex H, if applicable		P
I (-)	**ANNEX I IN THIS PART 2: BATTERIES FOR EMERGENCY LUMINAIRES** (Annex numbers between parentheses refer to IEC 60598-2-22)		P
(A.1)	Type of batteries	Li-ion	P
(A.2)	Conform to relevant standard	IEC 62133	P
	Operate within specific tolerance		P
(A.3)	Battery capacity for rated duration up to time of replacement		P
(A.4)	Sealed nickel cadmium batteries		N/A
(A.4.1)	Conform to IEC 60285		N/A

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
(A.4.2.a)	Maximum ambient air temperature 50 °C		N/A
(A.4.2.b)	Maximum overcharge rate 0,08 C_5A		N/A
(A.4.2.c)	Minimum ambient temperature 5 °C		N/A
(A.4.2.d)	Maximum discharge rates for 1 h: 0,6 C_5A and 3 h: 0,25 C_5A		N/A
(A.5)	Valve regulated lead acid batteries		N/A
(A.5.1)	Conform to IEC 60869-2 or IEC 61056-1		N/A
(A.5.2.a)	Maximum ambient air temperature 30 °C with temperature compensation or 25 °C without temperature compensation		N/A
(A.5.2.b)	Minimum recharge current 0,4 C_{20}		N/A
(A.5.2.c)	Maximum discharge rates for 1 h: 0,4 C_{20} and 3 h: 0,17 C_{20}		N/A
(A.5.2.d)	Maximum r.m.s. ripple current 0,1 C_{20}		N/A
(A.5.2.e)	Minimum ambient temperature 5 °C		N/A
(A.6)	Ambient temperature of cells measured after 48 h		P
(A.7)	Evidence of alternative operating parameters		N/A
J	**ANNEX J: REST MODE AND INHIBITION MODE FACILITIES** (ANNEX D IN IEC 60598-2-22)		N/A
	Rest mode:		N/A
	a) only operate when normal supply has failed		N/A
	b) remote control wiring is fail-safe		N/A
	c) normal mode at restoration of normal supply		N/A
	Inhibition mode:		N/A
	a) supply failure or disconnection not cause an unwanted discharge		N/A
	b) protection against interruption of remote control wiring		N/A
	1) safety circuits independent of other circuits		N/A
	2) safety circuits not pass through locations exposed to fire risk or explosion risk		N/A
	3) protection against overload may be omitted		—
	4) overcurrent in one circuit not impair circuits of safety services		N/A

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
	5) switchgear and controlgear clearly identified and in locations accessible only to competent persons		N/A
	6) Alarm devices clearly identified		N/A
K	**ANNEX K IN PART 1: BALLASTS INCORPORATING AN AUTOMATIC TESTING FUNCTION FOR EMERGENCY LIGHTING OPERATION**		P
	Fulfil relevant requirements of Table K.1	For automatic test function.	P
- (L)	**ANNEX L IN PART 1: PARTICULAR ADDITIONAL REQUIREMENTS FOR CONTROLGEARS PROVIDING SELV**		P
- (L.3)	**Classification**		N/A
	Class I	Yes ☐ No ☒	—
	Class II	Yes ☐ No ☒	—
	Class III	Yes ☐ No ☒	—
	non-inherently short circuit proof controlgear	Yes ☒ No ☐	—
	inherently short circuit proof controlgear	Yes ☐ No ☒	—
	fail safe controlgear	Yes ☐ No ☒	—
	non-short-circuit proof controlgear	Yes ☐ No ☒	—
- (L.4)	**Marking**		N/A
	Adequate symbols are used		N/A
- (L.5)	**Protection against electric shock**		**P**
	Comply with clause 9.2 of IEC 61558-1		P
- (L.6)	**Heating**		P
	No excessive temperatures in normal use		P
	Value if capacitor t_c marked ..... :	See ANNEX 1	—
	Winding insulation classified as Class ..... :	Class B	—
	Comply with tests of clause 14 of IEC 61558-1 with adjustments		N/A
- (L.7)	**Short-circuit and overload protection**		P

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
	Comply with tests of clause 15 of IEC 61558-1 with adjustments		P
- (L.8)	**Insulation resistance and electric strength**		P
- (L.8.1)	Conditioned 48 h between 91 % and 95 %		P
- (L.8.2)	Insulation resistance		P
	Between input- and output circuits not less than 5 MΩ ..... :	>100 MΩ	P
	Between metal parts of class II convertors which are separated from live parts by basic insulation only and the body not less than 5 MΩ ..... :	--	N/A
	Between metal foil in contact with the inner and outer surfaces of enclosures of insulating material not less than 2 MΩ ..... :	--	N/A
- (L.8.3)	Electric strength		P
	1) Between live parts of input circuits and live parts of output circuits ..... :	3750V	P
	2) Over basic or supplementary insulation between:		P
	a) live parts having different polarity ..... :	1875V	P
	b) live parts and body if intended to be connected to protective earth .....:	--	N/A
	c) accessible metal parts and a metal rod of the same diameter as the flexible cable or cord ..... :	--	N/A
	d) live parts and an intermediate metal part .....:	--	N/A
	e) intermediate metal parts and the body .....:	--	N/A
	f) each input circuit and all other input circuits .....:	--	N/A
	3) Over reinforced insulation between the body and live parts .....:		N/A
- (L.9)	**Construction**		P
- (L.9.1)	Transformer comply with 19.12 of IEC 61558-1 and 19 of IEC 61558-2-6		P

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
	HF transformer comply with 19 of IEC 61558-2-16		P
- (L.10)	**Components**		P
	Protective devices comply with 20.6 – 20.11 of IEC 61558-1		P
- (L.11)	**Creepage distances, clearances and distances through insulation**		P
	Creepage distances and clearances not less than in Clause 16		P
	Distance through insulation according Table L.5 in IEC 61347-1		N/A
	1) Basic distance through insulation		N/A
	Required distance (mm) ..... :	--	—
	Measured (mm) ..... :	--	N/A
	Supplementary information		—
	2) Supplementary distance through insulation		N/A
	Required distance (mm) ..... :	--	—
	Measured (mm) ..... :	--	N/A
	Supplementary information		—
	3) Reinforced distance through insulation		N/A
	Required distance (mm) ..... :	--	—
	Measured (mm) ..... :	--	N/A
	Supplementary information		—

- (N)	**ANNEX N IN PART 1: REQUIREMENTS FOR INSULATION MATERIALS USED FOR DOUBLE OR REINFORCED INSULATION**		**N/A**
- (N.4)	**General requirements**		**N/A**
- (N.4.1)	Material comply with IEC 60085 and IEC 60216 series		N/A
- (N.4.2)	**Solid insulation**		**N/A**
	Electric strength test at least 5 kV or 1,35 x test voltage in Table N.1		N/A

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
	If not classified according IEC 60085 and IEC 60216 series: Electric strength test increased 10 % to 5,5 kV or 1,5 x test voltage in Table N.1		N/A
- (N.4.3)	**Thin sheet insulation**		**N/A**
- (N.4.3.1)	Thickness and composition of thin sheet insulation		N/A
	- Inside the ballast and not subjected to handling or abrasion during the production and during maintenance		N/A
	- Non-separated layers: Min. 3 layers and fulfil mandrel test of 150N		N/A
	- Separated layers: Min. 2 layers and each layer fulfil mandrel test of 50N		N/A
	- Separated layers (alternative): Min. 3 layers and 2/3 of the layers fulfil mandrel test of 100N		N/A
- (N.4.3.2)	Mandrel test (electric strength test during mechanical stress)		N/A
	Electric strength test after mandrel test:		N/A
	- Non-separated layers: min. 5 kV or 1,35 x test voltage in Table N.1		N/A
	- 2/3 of min. 3 separated layers: min. 5 kV or 1,25 x test voltage in Table N.1		N/A
	- one of 2 separated layers: min. 5 kV or 1,25 x test voltage in Table N.1		N/A
	No flashover or breakdown occurred		N/A
- (O)	**ANNEX O IN PART 1: ADDITIONAL REQUIREMENTS FOR BUILT-IN ELECTRONIC CONTROLGEAR WITH DOUBLE OR REINFORCED INSULATION**		**N/A**
- (O.6)	**Marking**		**N/A**
	Marking according clause 7 (7)	See clause 7	N/A
	Special symbol		N/A
	Meaning of the special symbol explained in catalogue		N/A
- (O.7)	**Protection against accidental contact with live parts**		N/A

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
	Requirements of clause 8 (10)	See clause 8	N/A
	Test finger not possible to make contact with basic insulated metal parts		N/A
- (O.8)	**Terminals**		N/A
	Clause 9 (8)	See clause 9	N/A
- (O.9)	**Provision for earthing**		N/A
	Functional earthing terminals comply with clause 9 of part 1		N/A
	No protective earthing terminal		N/A
- (O.10)	**Moisture resistance and insulation**		N/A
	Clause 11 (11)	See clause 11	N/A
- (O.11)	**Electric strength**		N/A
	Clause 12 (12)	See clause 12	N/A
- (O.13)	**Fault conditions**		N/A
	Clause - (14)	See clause 28	N/A
	End of test, between live part and accessible metal parts or external parts of insulating material in contact with the supporting surface comply with dielectric strength test according clause 12 reduced to 35 % of values according Table 1 in part 1		N/A
	Insulation resistance according to O.10 between live part and accessible metal parts or external parts of insulating material in contact with the supporting surface not less than 4 MΩ		N/A
- (O.14)	**Construction**		N/A
	Clause 29 (15)	See clause 29	N/A
	Accessible metal parts insulated from live parts by double or reinforced insulation		N/A
	Live part insulated from supporting surface in contact with external faces by double or reinforced insulation		N/A
- (O.15)	**Creepage distances and clearances**		N/A
	Clause 30 (16)	See clause 30	N/A
	Comply with corresponding values for luminaries in IEC 60598-1		N/A
- (O.16)	**Screws, current-carrying parts and connections**		N/A
	Clause 31 (17)	See clause 31	N/A
- (O.17)	**Resistance to heat and fire**		N/A
	Clause 32 (18)	See clause 32	N/A

Attachment No.5

IEC 61347-2-7			
Clause	Requirement + Test	Result - Remark	Verdict
- (O.18)	**Resistance to corrosion**		N/A
	Clause 33 (19)	See clause 33	N/A

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
4 (4)	**GENERAL REQUIREMENTS**		**P**
- (4)	Insulation materials according requirements in Annex N of IEC 61347-1	(see Annex N)	N/A
- (4)	Compliance of independent controlgear enclosure with IEC 60598-1		N/A
	IP classification		N/A
	Mechanical stress		N/A
- (4)	Built-in magnetic ballast with double or reinforced insulation comply with Annex I of IEC 61347-1		N/A
- (4)	Built-in electronic controlgear with double or reinforced insulation comply with Annex O of IEC 61347-1	(see Annex O)	N/A
	Integral lamp controlgear compliance with clause 0.5 of EN 60598-1		P
4 (4)	SELV controlgear comply with Annex I of this part 2 and Annex L of IEC 61347-1		P
4 (-)	Transformer comply with IEC 61558		P
	Dielectric strength test of insulated winding wires is limited to 3 kV if input voltage ≤ 300 V		P

6 (6)	**CLASSIFICATION**		**P**
	Built-in controlgear ..... :	Yes☐ No☒	—
	Independent controlgear..... :	Yes☐ No☒	—*
	Integral controlgear ..... :	Yes☒ No☐	—
6 (-)	Auto-wound controlgear .....:	Yes☐ No☒	—
	Separating controlgear .....:	Yes☐ No☒	—
	Isolating controlgear ..... :	Yes☒ No☐	—
	SELV controlgear .....:	Yes☒ No☐	—

7 (7)	**MARKING**		**N/A**
7.1 (7.1)	Mandatory markings		N/A
	a) mark of origin		N/A
	b) model number or type reference		N/A

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	c) symbol for independent controlgear, if applicable		N/A
	d) correlation between interchangeable parts and controlgear marked		N/A
	e) rated supply voltage (V)		N/A
	supply frequency (Hz)		N/A
	supply current (A)		N/A
	f) earthing symbol		N/A
	g) rated maximum operating temperature of the winding		N/A
	h) indication that the lamp controlgear		N/A
	indication of the cross-section of conductors for which the terminals.		N/A
	j) the lamp type and rated wattage or wattage range for which the lamp controlgear is suitable, or the designation as indicated on the lamp data sheet of the type(s) of lamp(s) for which the lamp controlgear is designed		N/A
	k) wiring diagram		N/A
	l) value of t_c		N/A
	m) symbol for declared temperature		N/A
	n) heat sink(s)		N/A
	o) the limiting temperature		N/A
	p) the test period for the endurance test		N/A
	q) for lamp controlgear for which a constant S		N/A
	r) the rated no-load output voltage, when it is higher than the supply voltage		N/A
	s) symbol indicating the kind of controlgear providing SELV		N/A
	t) LUM earthing symbol		N/A
	u) if not SELV maximum working voltage U_{out} between:		N/A
	- output terminals (V) .....:	--	N/A
	- output terminals and earth (V) .....:	--	N/A

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	v) Declaration of the maximum equivalent output peak voltage Up		N/A
	w) maximum output peak voltage Ûout and its corresponding frequency fUout		N/A
7.1 (-)	Constant voltage type:	Yes ☐ No ☒	—
	- rated output power P_{rated} (W) .....:	--	N/A
	- rated output voltage U_{rated} (V) .....:	--	N/A
	Constant current type:	Yes ☒ No ☐	—
	- rated output power P_{rated} (W) .....:		N/A
	- rated output current I_{rated} (A) .....:		N/A
	Indication if for LED modules only		N/A
7.1 (7.2)	Marking durable and legible		N/A
	Rubbing 15 s water, 15 s petroleum; marking legible		N/A
7.2 (7.1)	Information to be provided, if applicable		N/A
	h) declaration on protection against accidental contact		N/A
	i) cross-section of conductors (mm²)		N/A
	j) number, type and wattage of lamp(s)		N/A
	s) SELV symbol		N/A
7.2 (-)	- declaration of mains connected windings		N/A
8 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		—
- (10.1)	Controlgear protected against accidental contact with live parts	Rely on luminaires enclosure	P
- (A2)	Voltage measured with 50 kΩ	(see Annex A)	N/A
- (A3)	Voltage > 35 V peak or > 60 V d.c. or protective impendance device	(see Annex A)	N/A
- (10.1)	Lacquer or enamel not used for protection or insulation		P
	Adequate mechanical strength on parts providing protection		N/A
- (10.2)	Capacitors > 0,5 μF: voltage after 1 min (V): < 50 V ..... :	4V after 1min.	P
- (10.3)	Controlgear providing SELV		P

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Accessible conductive parts are insulated from live parts by double or reinforced insulation in SELV controlgear		P
	No connection between output circuit and the body or protective earthing circuit		P
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		N/A
	SELV outputs separated by at least basic insulation		P
	ELV conductive parts insulated as live parts		N/A
	Tests according Annex L of IEC 61347-1		P
- (10.4)	Accessible conductive parts in SELV circuits		P
	Output voltage under load ≤ 25 V r.m.s. or ≤ 60 V d.c.		P
	If output voltage > 25 V r.m.s. or > 60 V d.c.; No load output ≤ 35 V peak or ≤ 60 V d.c and touch current does not exceed 0,7 mA (peak) or 2 mA d.c. ..... :	--	N/A
	One conductive part is insulated if output voltage or current exceeding the values above and withstand test voltage 500 V		N/A
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor	Y1 capacitor	P
	Y1 or Y2 capacitors comply with IEC 60384-14		P
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A
9 (8)	**TERMINALS**		—
	Screw terminals according section 14 of IEC 60598-1:		N/A
	Separately approved; component list	(see Annex 1)	N/A
	Part of the controlgear	(see Annex 3)	N/A

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Screwless terminals according section 15 of IEC 60598-1:		N/A
	Separately approved; component list	(see Annex 1)	N/A
	Part of the controlgear	(see Annex 4)	N/A
10 (9)	**PROVISION FOR PROTECTIVE EARTHING**		—
- (9.1)	Provisions for protective earthing		N/A
	Terminal complying with clause 8		N/A
	Locked against loosening and not possible to loosen by hand		N/A
	Not possible to loosen clamping means unintentionally on screwless terminals		N/A
	Earthing via means of fixing		N/A
	Earthing terminal only used for the earthing of the control gear		N/A
	All parts of material minimizing the danger of electrolytic corrosion		N/A
	Made of brass or equivalent material		N/A
	Contact surface bare metal		N/A
- (9.2)	Provision for functional earthing		N/A
	Comply with clause 8 and 9.1		N/A
- (9.3)	Earth contact via the track on the printed board		N/A
	Test with a current of 25 A between earthing terminal and each of the accessible metal parts; measured resistance (Ω) at ≥ 10 A according 7.2.3 of IEC 60598-1: < 0,5 Ω ..... :		N/A
- (9.4)	Earthing of built-in lamp controlgear		N/A
	Earth by means of fixing to earthed metal of luminaire in compliance of 7.2 of IEC 60598-1		N/A
	Earthing terminal only for earthing the built-in controlgear		N/A
- (9.5)	Earthing via independent controlgear		N/A
- (9.5.1)	Earth connection to other equipment		N/A
	Looping or through connection, conductor min. 1,5 mm² and of copper or equivalent		N/A

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Protective earthing wires in line with 5.3.1.1 and clause 7		N/A
- (9.5.2)	Earthing of the lamp compartments powered via the independent lamp controlgear		N/A
	Test with a current of 25 A between input and output earth terminals; measured resistance (Ω) between earthing terminal and each of the accessible metal parts at ≥ 10 A according 7.2.3 of IEC 60598-1: < 0,5 Ω ..... :	--	N/A
	Output earthing terminal marked as in 7.1 t) of IEC 61347-1		N/A
11 (11)	**MOISTURE RESISTANCE AND INSULATION**		**P**
	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 ..... :	> 100 MΩ	P
	For double or reinforced insulation ≥ 4 MΩ ..... :	> 100 MΩ	P
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		P
12 (12)	**ELECTRIC STRENGTH**		**P**
	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		N/A
	Working voltage > 50 V ≤ 1000 V, test voltage (V):		P
	Basic insulation, 2U + 1000 V	1480V	P
	Supplementary insulation, 2U + 1000 V		N/A
	Double or reinforced insulation, 4U + 2000 V	2960V	P
	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/A

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
13(13)	**THERMAL ENDURANCE TEST FOR WINDINGS OF BALLAST**		—

14 (14)	**FAULT CONDITIONS**		**P**
- (14.1)	When operated under fault conditions the controlgear:		P
	- does not emit flames or molten material		P
	- does not produce flammable gases		P
	- protection against accidental contact not impaired		P
	Thermally protected controlgear does not exceed the marked temperature value		N/A
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	P
- (14.2)	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)	P
	Creepage distances on printed boards less than specified in clause 16 in Part 1 provided with coating according to IEC 60664-3		N/A
- (14.3)	Short-circuit or interruption of semiconductor devices	(see appended table)	P
- (14.4)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	N/A
- (14.5)	Short-circuit across electrolytic capacitors	(see appended table)	P
- (14.6)	After the tests has been carried out on three samples:		P
	The insulation resistance ≥ 1 MΩ ..... :	> 100 MΩ	P
	No flammable gases		P
	No accessible parts have become live		P
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P
	Accessible parts compliance with Annex A		N/A
- (14.7)	Relevant fault condition tests with high-power supply		—

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
14 (-)	Temperature declared thermally protected lamp controlgear fulfil requirements in Annex C		N/A
15 (-)	**TRANSFORMER HEATING**		—
15.1(-)	General		P
	Transformer comply with clause L.6 and L.7 of IEC 61347-1		P
	Output voltage of SELV controlgear not exceed limits in 10.4 of IEC 61347-1 during the test of 15.1 and 15.2		P
15.2 (-)	Normal operation		P
	Comply with clause L.6 of IEC 61347-1		P
15.3 (-)	Abnormal operation		P
	Comply with clause L.7 of IEC 61347-1		P
	Double LED modules or equivalent load connected in parallel to the output terminals of constant voltage type		N/A
	Double LED modules or equivalent load connected in series to the output terminals of constant current type		P
15.3 (-)	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		P
16 (15)	**CONSTRUCTION**		**P**
- (15.1)	Wood, cotton, silk, paper and similar fibrous material		P
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
- (15.2)	Printed circuits		P
	Printed circuits used as internal connections complies with clause 14		P
- (15.3)	Plugs and socket-outlets used in SELV or ELV circuits		N/A

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	No dangerous compatibility between output socket-outlet and a plug for socket-outlets for input circuit in relation to installation rules, voltages and frequencies		N/A
	Plugs and socket-outlets for SELV comply with IEC 60906-3 and IEC 60884-2-4		N/A
	Plugs and socket-outlets for SELV ≤ 3 A, ≤ 25 V r.m.s. or ≤ 60 V d.c. and ≤ 72 W comply with IEC 60906-3 and IEC 60884-2-4 or:		N/A
	- plugs not able to enter socket-outlets of other standardised system		N/A
	- socket-outlets not admit plugs of other standardised system		N/A
	- socket-outlets without protective earth		N/A
- (15.4)	Insulation between circuits and accessible parts		P
- (15.4.1)	Controlgear shall provide suitable insulation between different electrical circuits and to accessible parts.		N/A
- (15.4.2)	SELV circuits		P
	Used SELV source		P
	Voltage ≤ ELV		P
	insulated from the LV supply by double or reinforced insulation		P
	insulated from other non SELV circuits (except FELV) by double or reinforced insulation		N/A
	insulated from FELV circuits by supplementary insulation		N/A
	insulated from other SELV circuits by basic insulation		N/A
	SELV circuits shall be insulated from accessible conductive parts by insulation according to Table 6 in 15.4.5.		N/A
-(15.4.3)	FELV circuits		N/A
	Sources used FELV circuits		N/A
	Voltage ≤ ELV		N/A

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	insulated from the LV supply by at least basic insulation		N/A
	not required that FELV circuits shall be insulated from other FELV circuits except for functional purpose.		N/A
	insulated from accessible conductive parts by an insulation according to Table 6 in 15.4.5.		N/A
	required in Clause 10, 11, 12 and 16 of this standard.		N/A
	plugs shall not be able to enter socket-outlets of other voltage systems;		N/A
	socket-outlets shall not admit plugs of other voltage systems;		N/A
	socket-outlets shall have a protective conductor contact.		N/A
-(15.4.4)	Other circuits		N/A
	requirements in Table 6 of 15.4.5.		N/A
-(15.4.5)	Insulation between circuits and accessible conductive parts		N/A
	Accessible conductive parts shall be insulated from active parts of electric circuit by an insulation according to Table 6		N/A
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		N/A
	- conductive parts are connected together		N/A
	- the test of IEC 60598-1:2014, 7.2.3 (earth continuity test with 10 A) has to be carried out.		N/A
	- conductive parts comply with the requirements of Annex A of this standard in case of insulation fault between live parts and accessible conductive parts.		N/A
17 (16)	**CREEPAGE DISTANCES AND CLEARANCES**		**P**
- (16.1)	**General**		**P**

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Creepage distances and clearances according to 16.2 and 16.3		P
	Controlgears providing SELV comply with additional requirements in Annex L	(see Annex L)	P
	Insulating lining of metallic enclosures		N/A
	Controlgear protected against pollution comply with Annex P	(see Annex P)	N/A
- (16.2)	**Creepage distances**		**P**
- (16.2.2)	Minimum creepage distances for working voltages		P
	Creepage distances according to Table 7	(see appended table)	P
- (16.2.3)	Creepage distances for working voltages with frequencies above 30 kHz		N/A
	Creepage distances according to Table 8	(see appended table)	N/A
- (16.3)	**Clearances**		**P**
- (16.3.2)	Clearances for working voltages		P
	Clearances distances according to Table 9	(see appended table)	P
- (16.3.3)	Clearances for ignition voltages and working voltages with higher frequencies		N/A
	Clearances distances for basic or supplementary insulation according to Table 10	(see appended table)	N/A
	Clearances distances for reinforced insulation according to Table 11	(see appended table)	N/A

18 (17)	**SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS**		**P**
	Screws, current-carrying parts and connections in compliance with IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1)		P
(4.11)	Electrical connections		P
(4.11.1)	Contact pressure		P
(4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
(4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
(4.11.4)	Material of current-carrying parts		P
(4.11.5)	No contact to wood or mounting surface		P
(4.11.6)	Electro-mechanical contact systems		N/A

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
(4.12)	Mechanical connections and glands		N/A
(4.12.1)	Screws not made of soft metal		N/A
	Screws of insulating material		N/A
	Torque test: torque (Nm); part.....:		N/A
	Torque test: torque (Nm); part.....:	--	N/A
	Torque test: torque (Nm); part.....:	--	N/A
(4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
(4.12.4)	Locked connections:		N/A
	- fixed arms; torque (Nm)..... :	--	N/A
	- lampholder; torque (Nm)..... :	--	N/A
	- push-button switches; torque 0,8 Nm..... :	--	N/A
(4.12.5)	Screwed glands; force (Nm)..... :	--	N/A

19 (18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		**P**
- (18.1)	Ball-pressure test .....:	See IEC60598-2-22 part	P
- (18.2)	Test of printed boards .....:	See IEC60598-2-22 part	P
- (18.3)	Glow- wire test .....:	See IEC60598-2-22 part	P
- (18.4)	Needle flame test .....:	See IEC60598-2-22 part	P
- (18.5)	Tracking test .....:	See Test Table 19 (18.5)	N/A

20 (19)	**RESISTANCE TO CORROSION**		**N/A**
	- test according 4.18.1 of IEC 60598-1		N/A
	- adequate varnish on the outer surface		N/A

21 (-)	**MAXIMUM WORKING VOLTAGE (U_{out}) IN ANY LOAD CONDITION**		**P**
	Not exceed declared maximum working voltage U_{out} in any load condition		P

14	**TABLE: tests of fault conditions**	**P**
Part	Simulated fault	Hazard
See the report IEC 61347-2-7		

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
A (A)	**ANNEX A - TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS A LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK**		**P**
-(A.1)	Comply with A.2 or A.3	Rely up luminaries enclosure	N/A
-(A.2)	Voltage ≤ 35 V peak or ≤ 60 V d.c .....:	--	N/A
-(A.3)	If voltage > 35 V peak or > 60 V d.c. or protective impendance device; touch current does not exceed 0,7 mA (peak) or 2 mA d.c. .....:	--	N/A
	Comply with Annex G of IEC 60598-1		N/A
B (B)	**Annex B - PARTICULAR REQUIREMENTS FOR THERMALLY PROTECTED LAMP CONTROLGEAR**		**N/A**
B.7	Marking		N/A
	- the symbol for "class P" thermally protected lamp controlgear		N/A
	- the symbol for temperature declared thermally protected lamp controlgear		N/A
B.8	Thermal endurance of windings		N/A
B.9	Lamp controlgear heating		N/A
B.9.1	Preselection test		N/A
B.9.2	“Class P” thermally protected lamp controlgear		N/A
B.9.3	Temperature declared thermally protected lamp controlgear as specified inIEC61347-2-8, with a rated maximum case temperature of 130°C or lower		N/A
B.9.4	Temperature declared thermally protected lamp controlgear as specifiedin IEC61347-2-8 with a rated maximum case temperature exceeding 130°C		N/A

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
B.9.5	Temperature declared thermally protected lamp controlgear as specified in IEC61347-2-9		N/A
C (C)	**ANNEX C – PARTICULAR REQUIREMENTS FOR ELECTRONIC LAMP CONTROLGEAR WITH MEANS OF PROTECTION AGAINST OVERHEATING**		**N/A**
(C3)	GENERAL REQUIREMENTS		N/A
(C3.1)	Thermal protection means integral with the convertor, protected against mechanical damage		N/A
	Renewable only by means of a tool		N/A
	If function depending on polarity, for cord-connected equipment protection means in both leads		N/A
	Thermal links comply with IEC 60691		N/A
	Electrical controls comply with IEC 60730-2-3		N/A
(C3.2)	No risk of fire by breaking (clause C7)		N/A
(C5)	CLASSIFICATION		N/A
	a) automatic resetting type		—
	b) manual resetting type		—
	c) non-renewable, non-resetting type		—
	d) renewable, non-resetting type		—
	e) other type of thermal protection; description ...:	Electronic circuit	N/A
(C6)	MARKING		N/A
(C6.1)	Symbol for temperature declared thermally protected ballasts		N/A
(C6.2)	Declaration of the type of protection provided		N/A
(C7)	LIMITATION OF HEATING		N/A
(C7.1)	Preselection test:		N/A
	Test sample placed for at least 12 h in an oven having temperature (t_c - 5) K		N/A

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	No operation of the protection device		N/A
(C7.2)	Functioning of protection means:		N/A
	Normal operation of the sample in a test enclosure according to Annex D at an ambient temperature such that (t_c +0; -5) °C is obtained		N/A
	No operation of the protection device		N/A
	Introducing of the most onerous test condition determined during test of clause 14		N/A
	Output of windings connected to the mains supply short-circuited, and other part of the convertor operated under normal conditions		N/A
	Increasing of the current through the windings continuously until operation of the protection means		N/A
	Continuous measuring of the highest surface temperature		N/A
	Ballasts according to C5 a) or C5 e) operated until stable conditions are achieved		N/A
	Automatic-resetting thermal protectors working 3 times		N/A
	Ballasts according to C5 b) working 6 times		N/A
	Ballasts according to C5 c) and C5) d) working once		N/A
	Highest temperature does not exceed the marked value		N/A
	Any overshoot of 10% over the marked value within 15 min		N/A

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
D (D)	**ANNEX D – REQUIREMENTS FOR CARRY OUT THE HEATING TESTS OF THERMALLY PROTECTED LAMP CONTROLGEAR**		**N/A**
	Tests in C7 performed in accordance with Annex D, if applicable		N/A
E (E)	**ANNEX E – USE OF CONSTANT S OTHER THAN 4500 IN t_w TESTS**		**N/A**
	Comply with tests according Annex E		N/A
F (F)	**ANNEX F - DRAUGHT-PROOF ENCLOSURE**		**P**
	Draught-proof enclosure in accordance with the description		P
	Dimensions of the enclosure		P
	Other design; description		P
H (H)	**ANNEX H - TESTS**		**P**
	All tests performed in accordance with the advice given in Annex H, if applicable		P
I (L)	**ANNEX I: PARTICULAR ADDITIONAL REQUIREMENTS FOR SELV D.C. OR A.C. SUPPLIED ELECTRONIC CONTROLGEAR FOR LED MODULES**		**P**
(L.3)	Classification		N/A
	Class I	Yes ☐ No ☒	—
	Class II	Yes ☐ No ☒	—
	Class III	Yes ☐ No ☒	—
	non-inherently short circuit proof controlgear	Yes ☒ No ☐	—
	inherently short circuit proof controlgear	Yes ☐ No ☒	—
	fail safe controlgear	Yes ☐ No ☒	—
	non-short-circuit proof controlgear	Yes ☐ No ☒	—

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
(L.4)	Marking		N/A
	Adequate symbols are used		N/A
(L.5)	Protection against electric shock		P
	Comply with 9.2 of IEC 61558-1		P
(L.6)	Heating		P
	No excessive temperatures in normal use		P
	Value if capacitor t_c marked ..... :	See ANNEX 1	—
	Winding insulation classified as Class ..... :	See ANNEX 1	—
	Comply with tests of clause 14 of IEC 61558-1 with adjustments		N/A
(L.7)	Short-circuit and overload protection		P
	Comply with tests of clause 15 of IEC 61558-1 with adjustments		P
(L.8)	Insulation resistance and electric strength		P
(L.8.1)	Conditioned 48 h between 91 % and 95 %		P
(L.8.2)	Insulation resistance		P
	Between input- and output circuits not less than 5 MΩ ..... :	>100 MΩ	P
	Between metal parts of class II convertors which are separated from live parts by basic insulation only and the body not less than 5 MΩ ..... :	--	N/A
	Between metal foil in contact with the inner and outer surfaces of enclosures of insulating material not less than 2 MΩ ..... :	--	N/A
(L.8.3)	Electric strength		P
	1) Between live parts of input circuits and live parts of output circuits ..... :	3750V	P
	2) Over basic or supplementary insulation between:		P
	a) live parts having different polarity ..... :	1875V	P

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	b) live parts and body if intended to be connected to protective earth .....:	--	N/A
	c) accessible metal parts and a metal rod of the same diameter as the flexible cable or cord ..... :	--	N/A
	d) live parts and an intermediate metal part .....:	--	N/A
	e) intermediate metal parts and the body .....:	--	N/A
	f) each input circuit and all other input circuits .....:	--	N/A
	3) Over reinforced insulation between the body and live parts .....:	--	N/A
(L.9)	Construction		P
(L.9.1)	Transformer comply with 19.12 of IEC 61558-1 and 19 of IEC 61558-2-6		P
	HF transformer comply with 19 of IEC 61558-2-16		P
(L.10)	Components		P
	Protective devices comply with 20.6 – 20.11 of IEC 61558-1		N/A
(L.11)	**Creepage distances, clearances and distances through insulation**		N/A
	Creepage distances and clearances not less than in Clause 16		N/A
	Distance through insulation according Table L.5 in IEC 61347-1		N/A
	1) Basic distance through insulation		N/A
	Required distance (mm) .....:	--	—
	Measured (mm) ..... :	--	N/A
	Supplementary information		—
	2) Supplementary distance through insulation		N/A
	Required distance (mm) .....:	--	—
	Measured (mm) ..... :	--	N/A
	Supplementary information		—
	3) Reinforced distance through insulation		N/A
	Required distance (mm) .....:		—

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Measured (mm) ..... :		N/A
Annex J (--)	**Particular additional safety requirements for a.c., a.c./d.c. or d.c. supplied electronic controlgear for emergency lighting**		N/A
J.1 (--)	General		N/A
J.2 (--)	Marking		N/A
J.2.1	Mandatory markings		N/A
	a) symbol of a.c., a.c./d.c. or d.c maintained emergency electronic controlgear	EL	N/A
	b) rated emergency power supply voltage or voltage range		N/A
J.2.2	Information to be provided if applicable		N/A
	a) Limits of the ambient temperature range		N/A
	b) Emergency output factor		N/A
	c) Information on whether the control gear is intended for use in luminaires for high-risk task area lighting		N/A
J.3	General notes on tests		N/A
J.4	Starting conditions		N/A
	Control gears shall start rated load(s) without adversely affecting the performance when operated in emergency mode		N/A
J.5	Operating condition		N/A
	The provisions of 7.2 of IEC 62384:2006 apply at 90 % and 110 % of the rated emergency supply voltage		N/A
J.6	Emergency supply current		N/A
	At the rated emergency supply voltage or voltage range, the emergency supply current shall not differ by more than ±15 % from the declared value when the control gear is operated in emergency mode with maximum load power		N/A

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
J.7	EMC immunity		N/A
J.8	Pulse voltage from central battery systems		N/A
	The d.c. supplied emergency controlgear shall withstand, without failure, any pulses caused by switching other equipment in the same circuit		N/A
J.9	Tests for abnormal conditions		N/A
	The provisions of Clause 12 of IEC 62384:2006 apply		N/A
J.10	Temperature cycling test and endurance test		N/A
	The provisions of Clause 13 of IEC 62384:2006 apply		N/A
J.11	Functional safety		N/A
	EOFx is measured 5 s and 60 s after switch on of the control gear in emergency mode at maximum emergency supply voltage and at minimum emergency supply voltage		N/A
	For the calculation of EOFx the lower value of the measurements below is used:		N/A
	a) electrical output parameter measured after 60 s at maximum voltage/electrical output parameter measured in reference setting		N/A
	b) electrical output parameter measured in steady state conditions at minimum supply voltage/electrical output parameter measured in reference setting		N/A
	After 5 s of operation with maximum emergency supply voltage at least 50 % of the declared EOFx shall be reached		N/A

(N)	**ANNEX N: REQUIREMENTS FOR INSULATION MATERIALS USED FOR DOUBLE OR REINFORCED INSULATION**	**N/A**
(N.4)	General requirements	N/A

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
(N.4.1)	Material comply with IEC 60085 and IEC 60216 series		N/A
(N.4.2)	Solid insulation		N/A
	Electric strength test at least 5 kV or 1,35 x test voltage in Table N.1		N/A
	If not classified according IEC 60085 and IEC 60216 series: Electric strength test increased 10 % of 5,5 kV or 1,5 x test voltage in Table N.1		N/A
(N.4.3)	Thin sheet insulation		N/A
(N.4.3.1)	Thickness and composition of thin sheet insulation		N/A
	- Inside the ballast and not subjected to handling or abrasion during the production and during maintenance		N/A
	- Non-separated layers: Min. 3 layers and fulfil mandrel test of 150N		N/A
	- Separated layers: Min. 2 layers and each layer fulfil mandrel test of 50N		N/A
	- Separated layers (alternative): Min. 3 layers and 2/3 of the layers fulfil mandrel test of 100N		N/A
(N.4.3.2)	Mandrel test (electric strength test during mechanical stress)		N/A
	Electric strength test after mandrel test:		N/A
	- Non-separated layers: min. 5 kV or 1,35 x test voltage in Table N.1		N/A
	- 2/3 of min. 3 separated layers: min. 5 kV or 1,25 x test voltage in Table N.1		N/A
	- one of 2 separated layers: min. 5 kV or 1,25 x test voltage in Table N.1		N/A
	No flashover or breakdown occurred		N/A

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

(O)	**ANNEX O: ADDITIONAL REQUIREMENTS FOR BUILT-IN ELECTRONIC CONTROLGEAR WITH DOUBLE OR REINFORCED INSULATION**		**N/A**
(O.6)	Marking		N/A
	Marking according clause 7 (7)	See clause 7	N/A
	Special symbol		N/A
	Meaning of the special symbol explained in catalogue		N/A
(O.7)	Protection against accidental contact with live parts		N/A
	Requirements of clause 8 (10)	See clause 8	N/A
	Test finger not possible to make contact with basic insulated metal parts		N/A
(O.8)	Terminals		N/A
	Clause 9 (8)	See clause 9	N/A
(O.9)	Provision for earthing		N/A
	Functional earthing terminals comply with clause 9 of part 1		N/A
	No protective earthing terminal		N/A
(O.10)	Moisture resistance and insulation		N/A
	Clause 11 (11)	See clause 11	N/A
(O.11)	Electric strength		N/A
	Clause 12 (12)	See clause 12	N/A
(O.13)	Fault conditions		N/A
	Clause 14 (14)	See clause 14	N/A
	End of test, between live part and accessible metal parts or external parts of insulating material in contact with the supporting surface comply with dielectric strength test reduced to 35 % of values according Table 1 in part 1		N/A

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Insulation resistance according to O.10 between live part and accessible metal parts or external parts of insulating material in contact with the supporting surface not less than 4 MΩ		N/A
(O.14)	Construction		N/A
	Clause 17 (15)	See clause 17	N/A
	Accessible metal parts insulated from live parts by double or reinforced insulation		N/A
	Live part insulated from supporting surface in contact with external faces by double or reinforced insulation		N/A
(O.15)	Creepage distances and clearances		N/A
	Clause 18 (16)	See clause 18	N/A
	Comply with corresponding values for luminaries in IEC 60598-1		N/A
(O.16)	Screws, current-carrying parts and connections		N/A
	Clause 19 (17)	See clause 19	N/A
(O.17)	Resistance to heat and fire		N/A
	Clause 20 (18)	See clause 20	N/A
(O.18)	Resistance to corrosion		N/A
	Clause 21 (19)	See clause 21	N/A
(P)	**Creepage distances and clearances and distance through isolation (DTI) for lamp controlgear which are protected against pollution by the use of coating or potting**		N/A
(P.1)	**General**		N/A
	P.2 applies if creepage distances less than the minimum in Table 7 and 8		N/A
	P.3 applies if clearance less than the minimum in Table 9, 10 and 11		N/A
(P.2)	**Creepage distances**		N/A

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
(P.2.2)	Minimum creepage distances for working voltages and rated voltages with frequencies up to 30 kHz (Table P.1)		N/A
	Basic or supplementary insulation:		N/A
	Required creepage.....:	--	—
	Measured.....:	--	N/A
	Supplementary information		—
	Reinforced insulation:		N/A
	Required creepage.....:	--	—
	Measured.....:	--	N/A
	Supplementary information		—
(P.2.3)	Creepage distances for working voltages with frequencies above 30 kHz (Table P.2)		N/A
	Voltage $\hat{U}_{out}$ kV .....:	--	—
	Frequency.....:	--	—
	Required distance.....:	--	—
	Measured.....:	--	N/A
	Supplementary information		—
(P.2.4)	Compliance with the required creepage distances		N/A
(P.2.4.1)	Compliance in accordance with 16.3.3 and test according P.2.4.2		N/A
(P.2.4.3)	Electrical tests after conditioning		N/A
(P.2.4.3.1)	Insulation resistance and electric strength according Clause 11 and 12		N/A
(P.3)	**Distance through isolation**		N/A
(P.3.4)	Electrical tests after conditioning		N/A
(P.3.4.1)	Insulation resistance and electric strength according Clause 11 and 12		N/A
(P.3.4.2)	Impulse voltage dielectrical test		N/A
	Basic or supplementary insulation:		N/A

Attachment No.6

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Working/rated voltage .....:	--	—
	Impulse voltage.....:	--	N/A
	Supplementary information		—
	Reinforced insulation:		N/A
	Working/rated voltage .....:	--	—
	Impulse voltage.....:	--	N/A
	Supplementary information		—

Attachment No.7

AS/NZS 61347.1			
Clause	Requirement + Test	Result - Remark	Verdict
APPENDIXZZ	**VARIATIONS TO IEC 61347-1 ED.3.0 (2015) FOR APPLICATION IN AUSTRALIA AND NEW ZEALAND (AS/NZS 61347.1:2016+A1:2018)**		**P**
(1)	**SCOPE**		**P**
	At the end of Clause 1, add the following text: Where the term lamp is used within this standard it is taken to include electric light sources. LED light sources are to be subject to the same test parameters as “other discharge lamps”.		—
	Amendment 1 specifies additional safety requirements for independent lamp controlgear to provide adequate protection in respect of the fire risk associated with the combination of independent lamp controlgear used with recessed luminaires, flammable building elements, flammable debris and building insulation.		—
	Add the following new normative references: AS 60529, Degrees of protection provided by enclosures (IP Code) AS/NZS 3191, Electric flexible cords AS/NZS 4859.1, Materials for the thermal insulation of buildings—General criteria and technical provisions AS/NZS 60695.2.11, Fire hazard testing — Part 2.11: Glowing/hot-wire based test methods—Glow-wire flammability test method for end-products AS/NZS 60695.11.10, Fire hazard testing — Part 11.10: Test flames —50 W horizontal and vertical flame test methods IEC 61048, Auxiliaries for lamps — Capacitors for use in tubular fluorescent and other discharge lamp circuits — General and safety requirements AS/NZS 61049, Auxiliaries for lamps — Capacitors for use in tubular fluorescent and other discharge lamp circuits — Performance requirements AS/NZS 61347, Lamp controlgear (all parts) AS/NZS 61535, Installation couplers		—
(3)	**TERMS AND DEFINITIONS**		**P**
(3.1.2)	Add: Independent lamp controlgear includes lamp controlgearpermanently connected and lamp controlgear able to bedisconnected from the light source. Independent lamp controlgearable to be disconnected are considered “separate to the luminaire”. NOTE *Separate excludes cutting connection wires.* Hereafter, “lamp controlgear” will be shown as “controlgear”.		—

Attachment No.7

AS/NZS 61347.1			
Clause	Requirement + Test	Result - Remark	Verdict
(3.101)	Do-not-cover classification An independent controlgearthat can be used where normallyflammable materials, including building insulation, are or may bepresent, but cannot be abutted against any material and cannot becovered in normal use.		—
(3.102)	IC classification An independent controlgear that can be abutted against normallyflammable materials, including building insulation, and can be covered in normal use. Building elements, building insulation ordebris have restricted access to the heated parts of the controlgear.		—
(3.103)	Non IC classification An independent controlgear that cannot be abutted against orcovered by normally flammable materials or used in installationswhere building insulation or debris is, or may be, present in normaluse. NOTE *This classification is not suitable for residential installations.*		—
(4)	**GENERAL REQUIREMENTS**		**P**
	After the fourth paragraph, add the following new Note: NOTE Test conditions and marking requirements for independent controlgear, for use with building insulation or flammable surfaces, for example when used with recessed luminaires, are under consideration.		—
(4.101)	Supply connection wiring		P
	Independent lamp controlgear shall be provided with only one of the following means of connection to the LV supply.		—

Attachment No.7

AS/NZS 61347.1			
Clause	Requirement + Test	Result - Remark	Verdict
	–Means of connection.....: a) Device for the connection of controlgears b) Terminals c) Connecting lead (tails) d) Supply cord and plug e) Adaptor for engagement with supply tracks f) Appliance inlet or inlet plug g) Installation coupler h) Luminaire coupler i) Integral pins for insertion into socket outlets	Connecting lead (tails)	P
	In Australia, equipment with a supply cord shall be fitted with a plug complying with AS/NZS 3112 or a coupler complying with its standard. However for other than controlgear supplying portable luminaire a plug is not required if the controlgear is marked with a cord tag with the symbol for “must be installed by a licensed electrician” in accordance with AS/NZS 60598.1.	 FIGURE ZZ1 MUST BE INSTALLED BY A LICENSED ELECTRICIAN	N/A
(4.102)	General		N/A
	The resistance to dust and solid object provisions of Section 9of AS/NZS 60598.1 apply, excluding the humidity test, along with the following:		—
	a) For independent controlgear with an IP classification greater than IP20, the tests and compliance criteria of Section 9 of AS/NZS 60598.1 shall be applied.		N/A
	b) For independent controlgear with an IC classification, the IP4X probe or IP rating tests of Clause 4.103 and compliance shall be applied.		N/A
(4.103)	Ingress test for IC classified controlgear		N/A

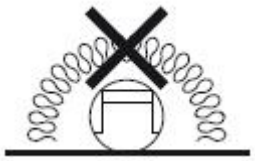
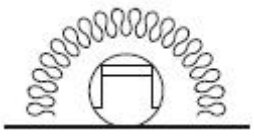
Attachment No.7

AS/NZS 61347.1			
Clause	Requirement + Test	Result - Remark	Verdict
	Solid foreign objects shall have restricted access to the hot surfaces of IC classified controlgear. The IP4X probe of AS 60529 shall be applied to the controlgear without appreciable force and shall not enter any area where the temperature of any part or surface exceeds the temperature limit for 'mounting surface: normally flammable surface' of AS/NZS 60598.1, when the surface is measured while the controlgear is operated in accordance with the thermal test conditions of Paragraph ZA1. NOTE *This test is intended to ensure fine flammable insulation material or debris is unlikely to enter controlgear and cause a fire.*		N/A
(5)	**GENERAL NOTES ON TESTS**		**P**
(5.101)	Controlgear voltage		P
	In Australia, for equipment other than Class III equipment, intended for connection to the a.c. supply mains, and that are not marked with: – a rated voltage of at least 240 V for single-phase equipment or a rated voltage of at least 415 V for three-phase equipment; or – a rated voltage range that includes 240 V for single-phase equipment and 415 V for three-phase equipment, The rated supply voltage and the upper limit of the voltage range is 240 V/415 V.		P
(5.102)	Independent controlgear for use near or in contact with building material or insulation		N/A
	Independent controlgear shall be—		—
	a) classified, marked and tested for suitability for use near building materials or insulation and classified "Do not Cover", or		N/A
	b) classified, marked and tested for suitability for use in contact with building materials and coverable with insulation, and classified as "IC".		N/A
(5.103)	Thermal tests for "Do-not-Cover" classified controlgear		N/A
(5.103.1)	"Do not-Cover" controlgear, normal operation test		N/A
	Controlgear classified as "Do not Cover" shall be tested in accordance with the requirements of Clause 5.5.		N/A
(5.103.2)	"Do-not-Cover" classified controlgear, abnormal operation test		N/A

Attachment No.7

AS/NZS 61347.1			
Clause	Requirement + Test	Result - Remark	Verdict
	Controlgear classified as “Do not Cover” shall be tested in accordance with the requirements of Paragraph ZA3. When the “Do not Cover” controlgear is tested in accordance with Paragraph ZA3, no temperature shall exceed—		N/A
	- a)mounting surface(°C)..... :	Limit: 90 °C	N/A
	- b) outer surface of the controlgear(°C)..... :	Limit: 130 °C	N/A
	During and after normal operation:		N/A
	- no damage to the controlgear such as scorching, deformation ormelting		N/A
	- no thermal protection device operate		N/A
	- no electronic control operate		N/A
(5.104)	Thermal tests for “IC” controlgear		N/A
	Controlgear classified as “IC” shall be tested in accordance with the requirements of Paragraph ZA3. When the “IC” controlgear is tested in accordance with Paragraph ZA3, no temperature shall exceed—		N/A
	a)the controlgear mounting surface (°C)..... :	See annex 4; Limit: 90 °C	N/A
	b) the lesser of t_c or 90 °C on the outside surface of the controlgear or other places accessible to the relevant test probe of Clause 4.103. (°C)..... :	See annex 4; Limit:t_c/90 °C	N/A
	During and after normal operation:		N/A
	- no damage to the controlgear such as scorching, deformation or melting		N/A
	- no thermal protection device operate		N/A
	- no electronic control operate		N/A
(6)	**Classification**		N/A
(6.101)	Independent controlgear shall be classified as:	☐ Do-not-cover ☐ IC ☐ Non-IC	N/A
(7)	**MARKING**		N/A
(7.1)	Language of instructions shall in English		N/A
	The information provided shall contain details related to components in controlgear requiring replacement as part of a maintenance program.		N/A

Attachment No.7

AS/NZS 61347.1			
Clause	Requirement + Test	Result - Remark	Verdict
	FELV control terminals shall be marked with the warning symbol “Risk of electric shock”. 		N/A
	Instructions shall be provided with controlgear that have FELV control terminals that state the following:		—
	–WARNING: FELV terminals marked “Risk of electric shock” are not safe to touch.		N/A
	–WARNING: Circuits connected to any FELV control terminal shall be insulated for the LV supply voltage of the controlgear and any terminals connected to the FELV circuit shall be protected against accidental contact.		N/A
(7.101)	Controlgear classification symbol		N/A
	Independent controlgear shall be marked with the symbol shown in the appropriate figure of this clause and the meaning explained in the instructions provided with the controlgear.		N/A
	Controlgear classified as “Non IC” does not require to be marked.		N/A
	Controlgear classified as “Do not Cover” shall be marked with the symbol 		N/A
	Controlgear classified as “IC” shall be marked with the symbol 		N/A
	NOTE *The independent controlgear symbol and the symbol for “Do not Cover” and “IC” can be combined to be represented as shown above.*		—
(7.102)	Additional information to be supplied with the controlgear		N/A

Attachment No.7

AS/NZS 61347.1			
Clause	Requirement + Test	Result - Remark	Verdict
	"Do-not-cover" and "Non-IC" classified controlgear shall be supplied with instructions and diagrams showing all dimensions for safe installation and include, as appropriate, the following:		N/A
	a) The minimum clearance distance from the top and sides of the controlgear to normally flammable building elements (mm)……..:		N/A
	b) If the minimum clearance distances from each side of the controlgear are different, then each minimum clearance distance shall be stated separately (mm)……..…:		N/A
	b) If 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 (mm)……..:		N/A
	c) Where controlgear is required to be mounted on a specific surface or has additional installation requirements, the relevant information shall be supplied with the controlgear. NOTE *Installation in a non-combustible enclosed space may include installation in a rebate in a concrete slab, ceiling or wall.*		N/A
(7.103)	Independent controlgear		N/A
	For independent controlgear not supplied with, but intended for use with, a separate lamp or light source container or head, for example, a remote mounted floodlight, the instructions supplied shall specify the independent controlgear parameters for use by the luminaire assembler.		N/A
(7.104)	Location and durability of marking		N/A
	The marking required by Clause 7.101 shall bea minimum size of 5 mm × 5 mm		N/A
(7.105)	Compliance		N/A
	Compliance with Clauses 7.101 to 7.104 is checked by inspection.		N/A
(10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		**P**
(10.1)	For the purpose of this Clause, FELV circuits are considered a live part.		N/A
(15)	**CONSTRUCTION**		**P**
(15.101)	Power factor correction capacitors		P

Attachment No.7

AS/NZS 61347.1			
Clause	Requirement + Test	Result - Remark	Verdict
	Power factor correction capacitors incorporated into controlgear shall be not less than Type B capacitors with metal body and break action protection in accordance with IEC 61048 and AS/NZS 61049. A capacitor complying with ANCI/EIA-456-A shall comply with AS/NZS 61049 and IEC 61048:2006, excluding the endurance test.		N/A
	In addition capacitors shall have a minimum voltage rating of 250 V at temperature rating of 85 °C or 280 V at temperature rating of 100 °C.		P
	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.		P
(18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		**P**
(18.2.1)	Parts of non-metallic material shall be resistant to flame and ignition.		P
	For materials other than ceramic, compliance is checked by the test of sub clauses 18.2.2, 18.2.3, 18.2.4 and 18.2.5 as appropriate.		P
	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 controlgear.		—
	This Clause applies to all parts, including components, even if they have been tested to their own standard		—
(18.2.2)	Parts of non-metallic material supporting connections shall withstand glow-wire test 750 °C.		P
(18.2.3)	All other parts of non-metallic material shall withstand glow-wire test 650°C.		P
(18.2.4)	During the application of the glow-wire tests of sub clauses 18.2.2 and 18.2.3, if the duration of the produced flames are ≥ 2s, the 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 are subjected to the needle-flame test.		N/A
(18.2.5)	PCBs which other than V-0 classification in controlgear shall be subject to the needle-flame test of AS/NZS 60695.11.5.	V-0	N/A

Attachment No.7

AS/NZS 61347.1			
Clause	Requirement + Test	Result - Remark	Verdict
	The needle flame is applied to one test sample for 30 s to an edge of the PCB at least 10 mm from a corner.		—

Attachment No.8

AS 61347.2.7			
Clause	Requirement + Test	Result - Remark	Verdict

1(1)	**Scope**	—
	Delete note and add the following: This Standard includes requirements for a.c./d.c. supplied mains voltage, recharging device. NOTE 1: Annex J of AS/NZS 61347.2.13 applies to LED a.c., a.c./d.c. or d.c. supplied electronic controlgear for connection to **centralised** emergency power supply systems that are also intended for emergency lighting operations from a.c./d.c. supplies. NOTE 2: Where the terms “controlgear”, “ballast” and “inverter” are used in this Standard, they are taken to mean controlgear for emergency lighting. NOTE 3: Where the term “lamp” is used in this Standard, it is taken to include all electric light sources.	—
2(2)	**Normative references**	—
	1 After first paragraph, add the following: The Australian or Australian/New Zealand Standards listed below are modified adoptions of, or not equivalent to, IEC normative references and are required for the application of this Standard. All references in the source text to those IEC normative references shall be replaced by references to the corresponding Australian or Australian/New Zealand Standards. Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. 2 Delete “IEC 60081, Double-capped fluorescent lamps — Performance specifications” and replace with: AS/NZS 4782.1, Double-capped fluorescent lamps — Performance specifications, Part 1: General (IEC 60081:2000, MOD) 3 Delete “IEC 60598-2-22, Luminaires — Part 2: Particular requirements — Luminaires for emergency lighting” and replace with: AS 60598.2.22, Luminaires, Part 2.22: Particular requirements — Luminaires for emergency lighting (IEC 60598-2-22:2017 (ED.4.1) MOD) 4 Delete “IEC 60921, Ballasts for tubular fluorescent lamps — Performance requirements” and replace with: AS/NZS 60921, Ballasts for tubular fluorescent lamps — Performance requirements 5 Delete “IEC 61347-1, Lamp controlgear — Part 1: General and safety requirements” and replace with:	—

Attachment No.8

AS 61347.2.7			
Clause	Requirement + Test	Result - Remark	Verdict
	AS/NZS 61347.1, Lamp controlgear, General and safety requirements (IEC 61347-1:2015, MOD) 6 Delete “IEC 61347-2-3, Lamp control gear — Part 2-3: Particular requirements for a.c. and/or d.c. supplied electronic control gear for fluorescent lamps” and replace with: AS/NZS 61347.2.3, Lamp controlgear, Part 2.3: Particular requirements for a.c. and/or d.c. supplied electronic controlgear for fluorescent lamps (IEC 61347-2-3, Ed.2.0 (2011) MOD) 7 Delete “IEC 61558-1:2005, Safety of power transformers, power supplies, reactors and similar products — Part 1: General requirements and tests, Amendment 1 (2009)1” and replace with: AS/NZS 61558.1:2018, Safety of transformers, reactors, power supply units and combinations thereof, Part 1: General requirements and tests (IEC 61558-1 Ed 3, MOD) 8 Delete Footnote 1. 9 Delete “IEC 61558-2-6:2009, Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V — Part 2-6: Particular requirements and tests for safety isolating transformers and power supply units incorporating safety isolating transformers” and replace with: AS/NZS 61558.2.6:2009, Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V, Part 2.6: Particular requirements for safety isolating transformers and power supply units incorporating safety isolating transformers (IEC 61558-2-6 Ed 2, MOD) 10 Delete “IEC 61558-2-16:2009, Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V — Part 2-16: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units” and replace with: AS/NZS 61558.2.16:2010, Safety of transformers, reactors, power supply units and similar products for voltages up to 1 100 V, Part 2.16: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units		
4 (4)	**GENERAL REQUIREMENTS**		—
	After third paragraph, add the following: NOTE: In Australia and New Zealand, the term		—

Attachment No.8

AS 61347.2.7			
Clause	Requirement + Test	Result - Remark	Verdict
	"automatic test" is used to denote compliance to the automatic test function as specified in AS/NZS 2293.3.		
7	**MARKING**		N/A
7.1 (7.1)	**Mandatory markings**		N/A
	Delete second dash point and replace with the following text: — controlgear without an enclosure are only required to be marked with items a) and b) of Clause 7.1 in IEC 61347-1.		N/A
	Delete third dash point and replace with the following text: — indication of type and current rating of the fuse, if the fuse is user replaceable.		N/A
	After fifth dash point, add the following note: NOTE: The EL-T symbol does not indicate the controlgear has an automatic test feature as specified in AS/NZS 2293.3.		N/A
7.2 (7.1)	**Information to be provided, if applicable**		N/A
	Second last dash point, delete "This to include:" and replace with the following: This information may be the battery model and manufacturer or all of the following information:		N/A
	Delete first sublist bullet point and replace with the following: • technology of the battery (e.g. NiCd, NiMH, Li-Ion, etc.)		N/A
	After sixth sublist bullet point, add the following: • details of any protection circuit internal to the battery if applicable.		N/A
15 (-)	**STARTING CONDITIONS**		P

Attachment No.8

AS 61347.2.7			
Clause	Requirement + Test	Result - Remark	Verdict
	After clause, add the following: For LED light sources the test in this clause is only conducted on one sample.		P
20 (-)	**FUNCTIONAL SAFETY (EBLF, EOF_X)**		P
20.101	**Functional safety in Australia**		N/A
	For Australia only, the requirements of this section (20) are optional. EBLF criteria are not required in Australia.	**Option:** ~~**consider /**~~ **not consider**	N/A
20.2	**Requirements for LED lamp controlgear**		P
20.2.1	Constant current LED controlgear: EOF_I and $I_{emergency}$		P
	Delete sixth paragraph and replace with the following: For the measurement of $I_{emergency}$ and EOF_I of the controlgear it is operated at a supply voltage which represents V_1 and V_{min} according to the following table: V_1 Full charge battery voltage per cell dependant on battery type as follows: NiCd 1.35 V per cell NiMh 1.35 V per cell Pb 2.10 V per cell $LiFePO_4$ 3.65 V per cell $Li(NiCoMn)O_2$ 4.0 V per cell V_{min} End of capacity battery voltage per cell dependant on battery type as follow: NiCd 1.10 V per cell NiMh 1.10 V per cell Pb 1.80 V per cell $LiFePO_4$ 2.0 V per cell $Li(NiCoMn)O_2$ 3.0 V per cell		P
	After clause, add the following:		P

Attachment No.8

AS 61347.2.7			
Clause	Requirement + Test	Result - Remark	Verdict
	NOTE 3 Full charge and end of capacity battery cell voltages may be declared by battery manufacturer or determined by test report to relevant IEC Standard.		
22 (-)	**RECHARGING DEVICE**		P
	For Australia, recharging device provide the rated charge performance specified by the battery manufacturer to charge the battery within **16 h**		P
	Transformers in the recharging device comply with relevant parts of IEC 61558-2-1, AS/NZS 61558.2.6:2009/AMD1:2012 and Annex BB of AS/NZS 61558.2.16:2010/AMD 3:2014, these requirements being specified in Clause 4.2 and Clause 5.13 of AS/NZS 61558.1:2008/AMD 2:2015.		P
22.1 (-)	**Low temperature operation**		P
	After first paragraph, add the following: This test shall be conducted at the lowest claimed operational temperature of the fitting.		P
	Delete Table 1 and replace with following: **Table 1 — Voltage per cell to which the battery is discharged**		—

Battery type	Discharge condition/cell V
NiCd	1.0
Lead Acid	1.8
NiMH	1.0
$Li(NiCoMn)O_2$	3.0[a]
$LiFePO_4$	2.0[a]

[a] Values by default and can be different depending on battery manufacturer declaration of design.

	Delete second paragraph, and replace with the following: The values apply at an ambient temperature of (20 ± 5) °C.		P

Attachment No.8

AS 61347.2.7			
Clause	Requirement + Test	Result - Remark	Verdict
	Charged battery at 0,9 times rated supply voltage at minimum ambient temperature for **16 h**		P
23 (-)	**PROTECTION AGAINST EXCESSIVE DISCHARGE**		P
	Protection against polarity reversal of individual cells, limits the discharge current when the battery voltage has fallen to Vlow according a) to d)		P
	d) For Li batteries:		P
	- Discharge current (A)……:	See IEC 61347-2-7	P
	Protection system prevents any further discharge until the normal supply has been restored. Battery voltage not below Vlow and discharge current not exceed a) to d)		P
	d) For Li batteries:		P
	- Battery voltage (V)……:	See IEC 61347-2-7	P
	- Discharge current (A)……:	See IEC 61347-2-7	P
	Compliance is checked by following test. Following a full charge cycle (24 h at rated voltage or **16 h for Australia and New Zealand**) the battery voltage and discharge current are measured during an emergency mode cycle to full discharge (or battery cut-off switching). The battery voltage shall not fall below V_{low} and the discharge current shall not exceed that specified. Testing is conducted at 25 °C ± 2 °C.		P
24 (-)	**INDICATOR**		P
	If the controlgear has an indicator incorporated or associated, it shall comply with the requirements of Clause 22.7.7 of AS 60598.2.22.		P
25 (-)	**REMOTE CONTROL, REST MODE, INHIBITION MODE**		N/A
	After heading, and before note, add the following: Where remote control, rest mode or inhibition mode is implemented it shall be tested to these requirements. Where implemented, the luminaire shall not be		N/A

Attachment No.8

AS 61347.2.7			
Clause	Requirement + Test	Result - Remark	Verdict
	supplied by the manufacturer with the luminaire in rest or inhibition mode.		
25.6 (-)	If rest mode or inhibiting facilities, in rest mode, current drain from batteries not exceed the values in 25.6		N/A
	After third dash point, add the following: — for **Li batteries** the battery voltage shall not fall below V_{low} and the discharge current shall not exceed that specified above at V_{low}. If the battery cut-off switching point is > V_{low} then a current > I_{low} is permitted until V_{low} is reached at which time the discharge current shall not exceed I_{low}. Testing is conducted at 25 °C ± 2 °C. Where a battery incorporates a built-in protection device, I_{low} shall be measured at the battery cell(s), pre-battery protection device: • V_{low} = X·n where n is the number of cells; X = 2,0 V for $LiFePO_4$ and 3.0 V for $Li(NiCoMn)O_2$, for all duration values. If a different value is specified by the battery manufacturer in the declaration of design, this value will have to be applied for X. • I ≤ I_{low} specified by the manufacturer in the declaration of design, or 2×10^{-6} C5A by default. The manufacturer may terminate the operation of the lamp prior to battery current cut off switching or V_{low} being reached, provided discharge duration requirements are met. When V_{low} is reached the residual current shall comply with the values specified above, or be in accordance with the battery manufacturers declared design specification.		—
	Delete second paragraph and replace with the following: Compliance is checked by measurement of the battery discharge current with the controlgear in the rest mode following a full battery charge cycle (24 h at rated supply voltage or **16 h** at rated supply voltage for **Australia and New Zealand**). Testing is conducted at 25 °C±2 °C. The current shall be measured at battery terminals.		P
	- Discharge current (A)……:	--	N/A

Attachment No.8

AS 61347.2.7			
Clause	Requirement + Test	Result - Remark	Verdict
29 (15)	**CONSTRUCTION**		N/A
29.1.2 (-)	Delete first sentence and replace with the following: Controlgear supplied with batteries shall incorporate a battery that meets the requirements of Annex I.		N/A

Attachment No.9

AS 61347.2.13			
Clause	Requirement + Test	Result - Remark	Verdict

4 (4)	**GENERAL REQUIREMENTS**		P
	Compliance of independent controlgear enclosure with EN 60 598- 1		N/A
	Independent SELV controlgear comply with Annex I	(see Annex I)	N/A
	Where the controlgear has accessible outputs, the controlgear shall be SELV output and comply with Annex I.		N/A
	SELV equivalent is not permitted where controlgear has accessible outputs or is classified as independent SELV		N/A

8 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		P
8.2	Exposed terminals of SELV controlgear if: the rated or maximum rated output voltages ≤ 25 V r.m.s or 60 V d.c. ripple-free d.c.		P
	If the voltage exceeds 25 V r.m.s. or 60 V ripple-free d.c. the touch current shall not exceed: – for a.c.: 0,7 mA (peak); – for d.c.: 2,0 mA; the no-load output voltage ≤ 33 √2 V peak or 60 V d.c. ripple-free d.c.		—
	- touch current .....:		N/A
	- no-load voltage.....:		N/A
	Insulated terminals if convertor with rated output voltage > 25 V or 60 V d.c. ripple-free d.c.		N/A
	One capacitor Y1 or two capacitors Y2 complying with IEC 60384-14 of the same values used in series between SELV or SELV-equivalent output and primary circuits	Y1 capacitor	P
	Other components bridging the separating transformer complying with IEC 60065, clause 14		N/A

21 (-)	**Maximum working voltage (Uout) in any load condition**		**P**
	After the first sentence, add the following: For SELV controlgear, the voltage at the output terminals shall not exceed the SELV limits of Clause 10.4 of IEC 61347-1 as modified by Clause 8 of this Standard (AS 61347.2.13:2018).		P

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
SECTION 1	**SCOPE AND GENERAL**		**P**
SECTION 2	**GENERAL REQUIREMENTS FOR EMERGENCY LUMINAIRES AND EXIT SIGNS**		**P**
2.2	**LUMINAIRE CLASSIFICATION**		P
	Emergency luminaires and dual function exit signs shall be classified in accordance with Appendix C and shall be marked in accordance with Clause 2.7		P
2.3	**SUITABILITY FOR OPERATING CONDTIONS**		P
	Emergency luminaires and exit signs shall start and operate as nominated in Appendix D and comply with AS/NZS 60598.2.22		P
	Product states suitability for operation at different conditions: (a) start and operate satisfactorily under these different conditions; and (b) meet the performance requirements of this Standard as applicable		P
2.4.	**ILLUMINATION AT SWITCH ON**		P
2.4.1	Maximum delay—Australia only		P
	Emergency escape luminaires shall provide a light output of at least- (a) 10% of the reference value within 1s of energization; and (b) 80% of the reference value within 15 s of energization.		P
	The requirements of Items (a) and (b) shall apply both when the emergency escape luminaires are initially switched on (i.e. cold start) and when the emergency escape luminaires are switched on immediately after operation for a period of 15 min (i.e. hot start)		P
2.4.2	Conditions for assessing compliance with Clause 2.4.1		P
	(a) Before the emergency escape luminaires are operated they shall be conditioned by connection to the normal supply in an ambient atmosphere at 25±2°C for a period of at least 1h		P
	(b) Centrally-supplied emergency escape luminaires shall be operated at their rated voltage or, where marked for operation within a		N/A

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
	range of voltages, the lowest marked voltage.		
	(c) Self-contained emergency escape luminaires shall utilize their in-built battery supply but the battery shall be in the fully charged state at the commencement of each assessment.		P
	For the assessment of light output required following a 15 min period of operation, the battery shall be in the fully charged state at the commencement of that period of operation. Loss of supply shall be simulated immediately afterwards for assessment of compliance with the light output criteria.		P
2.5	**LIGHT SOURCES**		P
	Where LED light sources are used as the emergency light source in emergency luminaires and exit signs, they shall comply with all of the following requirements.		P
	(a) The LED(s) used shall have an LM80 test report.		P
	(b) For maintained emergency luminaires or exit signs, the LED(s) shall fall within the parameters of the LM80 test report whilst operating within the luminaire or exit sign at an ambient temperature of 40°C.	For manual test function	P
	(c) For non-maintained emergency luminaires (and for New Zealand exit signs), the LED(s) shall fall within the maximum operating parameters of the LED data sheet (or as advised by the LED manufacturer) whilst operating within the luminaire or exit sign at an ambient temperature of 40°C.	For automatic test function	P
2.6	**CONVERSION PACKS**		N/A
	When embodying an emergency module (also known as a conversion pack) within a luminaire in order to convert it to an emergency luminaire, the converted luminaire shall be subjected to all the requirements of this Standard.		N/A
2.7	**MARKING**		P
	In addition to the information required by AS/NZS 60598.2.22, each emergency luminaire and exit sign shall be legibly and durably marked with the following information, as applicable.		P
	The following information shall be marked on a non-detachable part of the luminaire and not on the diffuser or other optical control media:		P

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
	(a)Luminaire classification(s) determined in accordance with Appendix C in respect of the following factors, as applicable		P
	(i) Differences in the luminous intensities emitted in the transverse (C0) and longitudinal (C90) vertical planes (see Paragraph C3.1).		P
	(ii) Lamps of differing lumen output with which it may be used (see Paragraph C3.1).	No such lamps	N/A
	(iii) Alternative forms in which the luminaire may be used (see Paragraph C2.2).		N/A
	(iv) Designed mounting positions (see Paragraph C2.3).		P
	(b) Marking to identify the orientation of the C0 plane through the luminaire (see Appendix C) where the luminaire has a different classification in the C0 and C90 planes.		P
	This marking shall be clearly visible during installation and subsequent inspection of the completed lighting system		P
	For luminaires where the C0 plane is not obvious, it may be designated by the location of the identification symbol of Figure 2.1 at the appropriate position on the surroundings of the luminaire body, i.e. by placing the symbol on the C0 axis relative to the light source.		P
	(c) The identification symbol specified in Figure 2.1. The symbol shall be black and white in colour and not less than 10 mm in diameter. It shall be located in a position where it will be visible from below when the luminaire is installed, except in cases where no appropriate surface exists on the luminaire e.g. where only diffusing media or similar are visible below the ceiling.  (FIGURE 2.1 IDENTIFICATION SYMBOL FOR EMERGENCY ESCAPE LUMINAIRES)	On the surface of the lamp can clearly visible during installation and subsequent	P
	(d) Information necessary to ensure correct lamp replacement. This shall include the following as applicable		N/A
	(i) For fluorescent lamps, a statement of acceptable lamp technologies that will not detrimentally affect such aspects as lumen output or the life of control gear. Statements of		N/A

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
	unacceptable technologies may also be included. Examples of technologies to be considered include tri-phosphor lamps and 'amalgam' lamps.		
	(ii) For incandescent lamps, a statement of the minimum acceptable nominal lumen output.		N/A
	(iii) The colour temperature of acceptable light sources.		N/A
	(e) Warning notice regarding isolation of the electrical supply or supplies, if necessary, to ensure the safety of persons working on the emergency luminaire or the integrity of operation of the emergency luminaire.		N/A
	(f) Where combined or sustained emergency luminaires are used, the location of the emergency light source shall be clearly marked, together with any information necessary to ensure correct light source replacement.		N/A
	(g) Designed mounting positions and orientation (related to luminaire position/safety IP rating, etc.). This information shall be marked on the luminaire to enable identification of the classification for each mounting position.		N/A
SECTION 3	**PARTICULAR REQUIREMENTS FOR EXIT SIGNS**		**P**
3.2	**TYPES OF EXIT SIGN**		P
	Exit signs shall be classified as one of four types, as follows:		P
	(a) Internally illuminated exit sign.		P
	(b) Dual function internally illuminated exit sign.		N/A
	(c) Low illuminance area exit sign.		N/A
	(d) Externally illuminated exit sign.		N/A
3.3	**APPEARANCE OF EXIT SIGN FACE**		P
3.3.1	Basic pictorial elements and shape		P
	The basic pictorial elements from which the face of any exit sign is constructed shall be in direct proportion to the applicable elements displayed in and specified by Figure 3.1.		P
	An exit sign shall consist of one or more of these elements, combined only in accordance with one of the combinations specified in Figure 3.2 or Figure 3.3.		P
	The green section of an exit sign shall be in the shape of a rectangle or square. The use of		P

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
	variations to these basic shapes (e.g. large-radius corners proposed due to manufacturing considerations) shall be acceptable only where specifically agreed by the relevant regulatory authority. The green section of an exit sign shall not be in the shape of a circle, nor of a triangle.		
3.3.2	Optional additional elements		N/A
	As well as the basic pictorial elements, an exit sign face may also contain additional background and optional additional background in accordance with Clause 3.3.4, and in the case of a standard self-illuminated exit sign only, a white border in accordance with Clause 3.3.5.		N/A
3.3.3	Location of elements		P
	Where a sign consists of one pictorial element [i.e. Figure 3.1(a) or (b)] this element shall be located in the centre of the additional background.		P
	Where a sign consists of two pictorial elements, these shall be immediately adjacent to each other and located in the centre of any optional additional background.		P
3.3.4	Additional background		N/A
	Where a standard or dual function internally illuminated or externally illuminated exit sign has only a single pictorial element, the face of the sign shall include additional background of an area at least equal to the total area of the pictorial element and this additional background shall comply with the requirements of Clause 3.4.2(d).		N/A
	Both additional background and optional additional background shall comply with the requirements of Clause 3.3.6.		N/A
3.3.5	Borders		P
	For a standard or dual function self-illuminated sign and for an externally illuminated sign, white transilluminated areas lying outside the areas of green background shall be acceptable on condition that any such areas—		P
	(a) form a continuous border around the green background; or		P
	(b) form lines of even thickness either at the sides or above and below the green background areas; or		P

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
	(c) comprise a total projected area not more than 20% of the combined area of the pictorial elements plus additional background.		P
	Borders shall not be used on low illuminance area exit signs.		P
3.3.6	Colours		P
3.3.6.1	For all types of exit sign, the colour of any additional background shall be identical to that of the background within the pictorial element(s), and there shall be no other color or marking present in either of these backgrounds except where allowed for under Clause 3.6.2		P
3.3.6.2	Standard and dual function internally illuminated exit signs		P
	The white and green colour portions of the face of a self-illuminated exit sign shall lie within the areas defined by the chromaticity coordinates specified in Table 3.1 TABLE 3.1 CHROMATICITY COORDINATES Colour / Corner points of colour region above the points: 1: White x 0.290, White y 0.260, Green x 0.285, Green y 0.707; 2: White x 0.265, White y 0.310, Green x 0.285, Green y 0.441; 3: White x 0.370, White y 0.405, Green x 0.170, Green y 0.364; 4: White x 0.460, White y 0.425, Green x 0.026, Green y 0.399		P
3.3.6.3	Low illuminance area exit signs		N/A
	The symbols on the face of a low illuminance self-illuminated sign shall be green and comply with the requirements specified in Table 3.1.The background shall be opaque and a colour other than green.		N/A
3.3.6.4	Externally illuminated exit sign		N/A
	The green and white portions of an externally illuminated exit sign shall comply with the relevant colour specification requirements specified in Clause 3.3.6.2.		N/A
	In New Zealand, the externally illuminated exit sign colour shall comply with New Zeland Building Code, Clause F8/AS1 3.1, Tables 2 and 3.		N/A
3.3.7	Size of pictorial elements		P
3.3.7.1	Minimum size-The minimum pictorial element height for any exit sign shall be 100 mm.		P
3.3.7.2	Maximum size-There shall be no limit on the maximum pictorial element height.		P

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
3.3.7.3	Recommended sizes-The pictorial element height on any exit sign should correspond to one of the following discrete sizes: Size mm 100 150 200 250		P
3.4	**ILLUMINATION**		P
3.4.1	General		P
	Exit signs, when illuminated, shall comply with the requirements of Clauses 3.4.2 to 3.4.4 as applicable. Where there is a difference in the luminous output of an exit sign face(s) between normal mains operation and emergency operation, the operating condition that results in the lower luminous output shall be used when assessing conformance with these clauses.		P
	Luminance measurements of C0 values shall be made within 5° from the normal to the face of the exit sign, using a meter with a circular measurement field of diameter not less than 75% and not more than 85% of the arm width as specified in Figure 3.4. Luminance measurements of C60 (horizontal) values shall be made at an angle between 55° and 75° in the horizontal plane to the normal to the face of the sign.		P
	They shall also comply with the requirements of Clause 2.3 except that the reference value shall be the luminance value after stable photometric conditions have been attained.		P
3.4.2	Standard and dual function internally illuminated exit signs		P
	The following requirements apply:		P
	(a) On the green areas of the pictorial elements, at each applicable measurement site specified in Figure 3.4, the C0 luminance measured shall be not less than 8 cd/m2 and the C60 luminance shall be not less than 10% of the C0 value.		P
	(b) The ratio of the C0 luminance measured at each applicable white measurement site specified in Figure 3.4 to the C0 value at the nearest green measurement site shall be not less than 4:1.		P

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
	(c) The variation in C0 luminance between any two white measurement sites specified in Figure 3.4, or between any two green measurement sites in the same figure, shall not be greater than 5:1.		P
	(d) For a single element sign, at no point shall the luminance be less than the minimum C0 and C60 values stated in Item (a) for an additional background, which shall be adjacent to the pictorial element and have a minimum area that is at least equal to the area of the pictorial element.		P
3.4.3	Low illuminance area exit signs		N/A
	The requirements are as follows:		N/A
	(a) At each applicable green measurement site specified in Figure 3.4, the C0 luminance measured shall be not less than 2 cd/m2 and not greater than 25 cd/m2; the C60 luminance shall be not less than 10% of the C0 value.		N/A
	(b) The variation in C0 luminance between any two applicable measurement sites specified in Figure 3.4 shall be not greater than 5:1.		N/A
3.4.4	Externally illuminated exit signs		N/A
	Externally illuminated exit signs shall be in accordance with AS/NZS 2293.1:201X, Clause 5.7.2.		N/A
3.4.5	Projected light source life in LED exit signs		P
	For exit signs ultilizing LEDs as their light source, a projection of the light source life shall be undertaken in accordance with Appendix E.		P
3.5	**MAXIMUM VIEWING DISTANCES**		P
	For exit signs of pictorial element height greater than 200 mm, the maximum viewing distance shall be calculated by the following equation: Maximum viewing distance = 160 × element height.		P
	For any exit sign of pictorial element height less than or equal to 200 mm the maximum viewing distance shall be as specified in Table 3.2.		P

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
	TABLE 3.2 **MAXIMUM VIEWING DISTANCE CATEGORIES** Element height mm / Maximum viewing distance m ≥100 <150 / 16 ≥150 <200 / 24 200 / 32		
3.6	**MARKING**		P
3.6.1	On body of exit sign	See above clauses	P
	The requirements of Clause 2.6 shall apply		P
	For LED exit signs the body shall also be marked with the Projected Light Source Life in accordance with Appendix E.		P
3.6.2	On face of exit sign	See below clauses	P
3.6.2.1	Maximum viewing distance		P
	The appropriate maximum viewing distance in accordance with Table 3.2 shall be marked on the face of the exit sign, located on the background either within one of the elements or on additional background. The distance shall be displayed as a one or two digit number (as applicable) followed by the letter 'm'.		P
	The digits and lettering shall be not less than 5 mm high and not more than 10 mm high.		P
	Transilluminated white writing shall be acceptable on white and green signs but not on signs for low illuminance areas.		P
3.6.2.2	Other information		N/A
	The manufacturer may display an identifying name or company logo on the face of an exit sign. This shall not be more than 10 mm high and shall be displayed close to and in the same colour as the maximum viewing distance.		N/A
SECTION 4	**PARTICULAR REQUIREMENTS FOR SELF-CONTAINED EMERGENCY LUMINAIRES AND EXIT SIGNS**		P
4.1	**APPLICATION**		P
	Self-contained emergency luminaires and exit		P

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
	signs, in addition to complying with the general requirements of Sections 2, 3 or 5, as applicable, shall comply with the additional requirements of this Section		
4.2	**ARRANGEMENT AND CONTROL**		P
4.2.1	Automatic battery cut-off		P
	Means shall be provided to automatically disconnect the battery from the load before the cell voltage falls below the minimum value recommended by the cell manufacturer. For this requirement, the minimum voltage recommended by the cell manufacturer shall be—		P
	(a) relevant to the number of cells used in the battery at the discharge rate applicable for the emergency luminaire or exit sign; and		P
	(b) selected to avoid the possibility of individual cells in the battery pack going into reverse polarity within 10 charge/discharge cycles.		P
	The means of disconnection shall—		P
	(i) automatically reset upon restoration of the normal supply; and		P
	(ii) be arranged so that, after disconnection, the drain imposed on the battery is not greater than that recommended by the cell manufacturer for the operating conditions, so that the battery will not be discharged to the extent that it is incapable of recovery.		P
4.2.2	Test switch	For manual test function	P
	A switch shall be provided to permit the operation of each emergency escape luminaire or exit sign to be checked by simulating a supply circuit failure. The switch shall be—		P
	(a) accessible from the exterior of the emergency escape luminaire or exit sign and in a convenient position for operation; and		N/A
	(b) of a type which cannot be maintained in the test position without the attendance of the person conducting the test		P
	Notwithstanding the above requirements, the following exemptions shall apply		N/A
	(i) An internal test switch may be provided for emergency escape luminaires or exit signs of a type for which it is impractical to incorporate an external test switch, e.g. vandal-resistant luminaires or recessed troffer luminaires which have separate body elements. The internal test switch shall be located in a position which is		N/A

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
	normally accessible during light source and/or battery replacement		
	(ii) No test switch need be provided for emergency escape luminaires or exit signs which are designed for use in hazardous locations, where the possibility of sparking resulting from operation of the switch would compromise safety features of the luminaire design.		N/A
	(iii) For remote self-contained luminaires or exit signs, the test switch may be located on either the luminaire or remote mounted control gear enclosure where the emergency luminaire or exit signs are located greater than 2 m apart from its control gear. Where the test switch is located on the luminaire, the maximum separation distance and cable type shall be specified by the manufacturer and Appendix D tests shall be performed at the worst case.		P
4.2.3	Battery isolation facility		P
	Any facility which is provided for the purpose of preventing operation of the emergency escape luminaire or exit sign from the emergency power source when disconnected from the normal supply shall-		P
	only be capable of operation by the use of a key or special tool; and		P
	(b) be clearly marked as to its function and operating position		P
4.3	**BATTERIES**		P
4.4.1	Required type	$LiFePO_4$ type, rechargeable	P
	Batteries shall be suitable for use in emergency luminaries and exit signs when subjected to the tests of Appendix D and are safe for charging, discharging and storage for extended periods at elevated temperature. Batteries shall be of the sealed rechargeable type specifically designed for emergency or standby use. The batteries shall be fitted with selfresealing gas vents or similar, as required by battery/cell chemistry and/or relevant safety standards.		P
	Batteries which are designed for operation only in specified positions, e.g. vertical, may be used provided that any restriction which this may place on the mounting of the luminaire is clearly marked.		P
	Batteries other than nickel cadmium, lead acid, nickel metal hydride, or lithium shall comply with a relevant AS, NZS, IEC or ANSI battery		P

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
	product Standard for extended charge at elevated temperatures. Where such Standards do not exist, conformance shall be tested against the cell manufacturer's specifications.		
	Batteries which utilize sealed nickel-cadmium cells shall comply with the requirements of IEC 61951-1 for cells intended for permanent charge at elevated temperatures.		N/A
	Batteries which utilize sealed nickel metal hydride cells shall comply with the requirements of IEC 61951-2 for cells intended for permanent charge at elevated temperatures.		P
	Valve regulated lead-acid batteries shall comply with the relevant requirements of IEC 60896-21. Lithium cells shall comply with the requirements of IEC 62133 and IEC 62620.		N/A
4.3.2	Battery capacity		P
	Each battery shall be legibly and durably marked with the ampere-hour capacity assigned by the battery manufacturer at a specified rate of discharge.		P
4.3.3	Intercell connections		P
	Connections between the cells of a battery shall be made by a reliable means such as soldering, welding, bolting or the use of quick-connect tab and receptacle connectors. Such connections shall either be inherently corrosion-resistant or shall be treated to prevent corrosion		P
4.3.4	Battery circuit protection		P
	Battery circuit protection shall comply with the relevant section of AS/NZS 60598.2.22.		P
4.3.5	Provision for battery replacement		P
	Where batteries are intended to be replaceable they shall be located and secured within emergency luminaires and exit signs in a manner that will enable their replacement to be readily effected without dismantling or replacing other internal components.		P
	Connections between batteries and other equipment in the emergency escape luminaire or exit sign shall be made by easily replaceable means, such as quick-connect tab and receptacle connectors, which provide reliable electrical connections. Such connections shall either be inherently corrosion-resistant or shall b e treated to prevent corrosion.		P
4.4	**BATTERY CHARGERS**		**P**

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
4.4.1	General		P
	The design of the battery charger shall be such that, when subjected to the short circuit test in AS/NZS 60598.2.22 it will either—		P
	(a) continue to function; or		N/A
	(b) fail in a safe manner		P
	The rating of the battery charger shall be such that-		P
	(i) after the battery has been discharged from the fully-charged state by operating the emergency luminaire or exit sign for the initial duration of operation specified in Section 2 of AS 2293.1; and		P
	(ii) after recharging for a period of not more than 16 h		P
	the battery shall have recovered to the extent that it is capable of sustaining an additional discharge as specified in Item (i). The output voltage at the end of each discharge period shall be not less than that recommended by the battery manufacturer.	For manual test function	P
	The battery charger shall recharge and maintain the battery automatically while the normal supply to the emergency escape luminaire or exit sign is available. The system shall be arranged so that the battery will not receive a charge in excess of the limits recommended by the battery manufacturer under any condition of operation.	For automatic test function	P
4.4.2	Visual indicator		P
	Visual indication of battery charger operation shall be provided. The indicator shall be-		P
	either red or green in colour		P
	(b) connected to the output side of the battery charger		P
	(c) arranged such that failure of the indicator device will not render the emergency luminaire or exit sign inoperative; and		P
	(d) located in a position which will be visible when mounted in any designed attitude.		P
	It is permissible to use this indicator to display additional information—for example by flashing.		N/A
4.5	**SELF-CONTAINED AUTOMATIC DISCHARGE TESTING FACILITIES**	For automatic test function.	P
4.5.1	Application		P

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
	This Clause applies to emergency luminaires and exit signs that are provided with selfcontained, automatic facilities for discharge testing, i.e. fully stand-alone systems.		P
4.5.2	General requirements		P
	The testing system used shall comply with the general requirements for automatically operated testing facilities in Section 3 of AS/NZS 2293.1, and with the following:		P
	(a) The test facility shall not interfere with the capability of the emergency luminaire or exit sign to operate correctly in response to loss of the normal supply.		P
	(b) The test facility shall automatically subject the emergency luminaire or exit sign to a discharge test at intervals of not more than specified in AS/NZS 2293.2. The system used to time the interval between successive discharge tests shall not be affected during periods when the normal supply is interrupted.		P
	(c) The test facility shall provide for the discharge test to continue for at least the required duration and, for the period of the test, the battery shall receive no charge.		P
	(d) Sensing means shall be provided to confirm that the emergency light source(s) remained illuminated for the required duration.		P
	(e) If loss of the normal supply occuhe emergency mode until the test has rs while the test is in progress, the emergency luminaire or exit sign shall remain connected in tbeen completed or, if the normal supply has not been restored, until the emergency luminaire or exit sign is disconnected by the automatic battery cut off device.		P
4.5.3	Required indications		P
	Distinctive indications shall be provided at each emergency luminaire or exit sign to identify the following operational states:		P
	(a) Normal state—an indication that the emergency luminaire or exit sign is in the normal mode, awaiting the next discharge test.		P
	(b) Recently tested and complies—a temporary indication that the emergency luminaire or exit sign was recently tested and remained illuminated for the required duration. The indication shall be maintained for at least 5 days following completion of the test after which the		P

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
	indication shall revert to that described in Item (i) below.		
	(c) Tested and failed—an indication that the emergency light source(s) failed to remain illuminated for the required duration when subjected to a discharge test. This indication shall be maintained until the fault has been rectified and the emergency luminaire or exit sign successfully passes a subsequent discharge test.		P
	Where a single visual indicator is used to provide all of the indications required by Items (a) to (c), it shall be yellow in colour and the following illuminated states shall have the meanings given:		P
	(i) Continuously illuminated—to indicate the normal state. See Item (a).		P
	(ii) Slow flash—to indicate recently tested and complies. See Item (b).		P
	The cycle shall comprise 4 s ‘on’ and 1 s ‘off’.		P
	(iii) Fast flash—to indicate tested and failed. See Item (c).		P
	The cycle shall comprise 0.5 s ‘on’ and 0.5 s ‘off’.		P
4.6	**MARKING**		**P**
	Self-contained emergency luminaires and exit signs shall be marked in accordance with the requirements of Clauses 2.7 or 3.6 as applicable, and shall also be marked with the following information:		P
	The information necessary to ensure correct replacement of the batteries.	See label	P
	(b) Any restriction on luminaire orientation and the battery mounting position.		P
	Where the emergency power supply unit is located separately from the emergency escape luminaire or exit sign, each assembly shall be marked with the appropriate information required above	No separation	N/A
	Where combined or sustained emergency escape luminaires are used, the location of the emergency lamp shall be clearly marked, together with any information necessary to ensure correct lamp replacement.		P

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
SECTION 5	**PARTICULAR REQUIREMENTS FOR CENTRALLY SUPPLIED EMERGENCY LUMINAIRES AND EXIT SIGNS**		**N/A**
5.1	**APPLICATION**		N/A
	Centrally supplied emergency lighting systems include the battery and charger system and associated emergency luminaires and exit signs. The requirements for the charger and battery used for centrally supplied systems are included in AS/NZS 2293.1.		N/A
	Emergency luminaires and exit signs for these systems shall, in addition to complying with the general requirements of Sections 2 and 3 as applicable, comply with the additional requirements of this Section		N/A
5.2	**ARRANGEMENT AND CONTROL**		N/A
5.2.1	Test switch		N/A
	A centrally supplied emergency luminaire or exit sign does not require a test switch.		N/A
5.2.2	Visual indicator		N/A
	A centrally supplied emergency luminaire or exit sign does not require a visual indicator.		N/A
5.3	**MARKING**		N/A
	Centrally supplied emergency luminaires and exit signs shall be marked in accordance with the requirements of Clauses 2.7 or 3.6 as applicable, and shall also be legibly and durably marked with the following information:		N/A
	(a) Where the luminaire or exit sign has provision for connection to a single supply only: 'WARNING: Centrally supplied luminaire'.		N/A
	(b) Where the exit sign or luminaire has provision for connection to two supplies: 'WARNING: Centrally supplied luminaire—Dual voltages within'		N/A
APPENDIX A	**ESSENTIAL DATA AND PREFERRED FORMAT FOR TEST REPORTS FOR EMERGENCY LUMINAIRES AND EXIT SIGNS**		**P**
APPENDIX B	**SAMPLE DECLARATION OF CONFORMANCE FOR EMERGENCY LUMINAIRES AND EXIT SIGNS**		**P**
APPENDIX C	**CLASSIFICATION OF EMERGENCY ESCAPE LUMINAIRES**		**P**
C1	BASIS OF CLASSIFICATION		P
C2	TEST CONDITIONS		P
C2.1	General		P

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
	The emergency escape luminaire shall be tested in accordance with the requirements of this Appendix under the appropriate conditions specified in AS 1680.3, CIE S025 or IES LM-79.		P
C2.2	Alternative luminaire combinations		N/A
	Where the emergency escape luminaire is designed for use in several different combinations (e.g. the same basic luminaire with different diffusers) each combination shall be tested as specified and information shall be marked on the luminaire to enable identification of the classification for each of the combinations		N/A
C2.3	Mounting position		P
	Horizontal plane		P
	Where designed for use in other mounting positions, e.g. on a wall or other vertical surface, the emergency escape luminaire shall be tested in each of the designed mounting positions and information shall be marked on the luminaire to enable identification of the classification for each mounting position		P
C2.4	Test voltage and current		P
	For the photometry necessary to establish the classification of an emergency escape luminaire, the following conditions shall apply-		P
	(a) Centrally supplied luminaires		P
	(i) For connection to d.c. supply—80% of the rated voltage of the luminaire		P
	(ii) For connection to a.c. supply from central inverter—90% of the rated voltage of the luminaire		P
	(b) Self-contained emergency escape luminaires		P
	The test voltage shall be as determined in accordance with Paragraph D2.1 of Appendix D. The batteries shall be disconnected and replaced by a separate d.c. supply of the required voltage		P
C3	PROCEDURE FOR DERIVING THE LUMINAIRE CLASSIFICATION		P
C3.1	General procedure		P
	The luminous intensities emitted by the luminaire shall be measured in both the C0 and C90 planes at intervals of not more than 5°, from the downward vertical direction, up to and including 90° above the downward vertical.		P
	luminaire has an asymmetric light distribution in		P

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
	the particular plane, the luminous intensities for the half-plane which produces the lowest classification shall be used.		
C3.2	Method of assigning the classification		P
C3.2.1	General		P
	The classification assigned to an emergency escape luminaire shall comprise the combination of an alphabetic and a numerical designation		P
C3.2.2	Alphabetic component of the classification		P
	The alphabetic component of the classification, in the form of the letters A, B, C, D or E, shall be assigned		P
	The luminous intensities at each of the measured angles shall be not less than the values		P
	(a) For Class A emergency escape luminaires —$I_p = I_o * \cos^4\gamma$ (for $\gamma \leq 70°$)		P
	(b) For Class B emergency escape luminaires —$I_p = I_o * \cos^3\gamma$ (for $\gamma \leq 70°$)		P
	(c) For Class C emergency escape luminaires —$I_p = I_o * \cos^{1,5}\gamma$ (for $\gamma \leq 70°$)		P
	(d) For Class D emergency escape luminaires —$I_p = I_o * (2+\cos\gamma)/3$ (for $\gamma \leq 70°$)		P
	(e) For Class E emergency escape luminaires —$I_p = I_o * (1+0,4\gamma/30)$ (for $\gamma \leq 30°$); $I_p = 1,07 * I_o * \cos 2,6(\gamma-35)$ (for $\gamma > 30° \leq 65°$)		P
C3.2.3	Numerical component of the classification		P
	The luminous intensity for any one measurement angle up to and including 30° from the downward vertical may, for that angle only, be up to 20% below the minimum value determined from the relevant equation prior to any application of the derating factor.		P
	The numerical component of the classification shall be assigned corresponding to any value in the following series which is equal to or less than the actual luminous intensity in the downward vertical direction: 1, 1.25, 1.6, 2, 2.5, 3.2, 4, 5, 6.3, 8, 10, 12.5, 16, 20, 25, 32, 40, 50 …		P
C3.3	Glare limitations		P
	In order to restrict disability glare at higher angles, limitations are applied to the luminous intensity of the luminaire based on the mounting height range in accordance with Table C1.		P

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
	TABLE C1 DISABILITY GLARE LIMITS Mounting height (H) above floor level m / Maximum luminous intensity from 60 to 90 degrees from nadir (I_{max}), cd $H < 2.5$: 500 $2.5 \le H < 3.0$: 900 $3.0 \le H < 3.5$: 1600 $3.5 \le H < 4.0$: 2500 $4.0 \le H < 4.5$: 3500 $4.5 \le H$: 5000		
C3.4	Colour temperature and colour rendering index		P
	The colour temperature shall fall with the range from 2500 K to 7000 K.	See below appendix	P
	The minimum value of the colour rendering index *R*a of the light source utilized in any emergency luminaire shall be greater than 40.	See below appendix	P
APPENDIX D	**TYPE TESTING OF SELF-CONTAINED EMERGENCY ESCAPE LUMINAIRES AND EXIT SIGNS**		**P**
D1	**TEMPERATURE TESTS**		**P**
D1.1	Application		P
	Each design/type of self-contained emergency escape luminaire and exit sign shall be subjected to a high temperature test and a low temperature test, conducted in that order in accordance with Tables D1 and D2 respectively, and shall comply with the appropriate requirements stated therein		P
	Where a range of self-contained emergency escape luminaires or exit signs utilize the same circuit, components and enclosure, each luminaire or exit sign need not be tested, provided that		P
	(a) the luminaire or exit sign selected for the high temperature test represents the form that will produce the highest internal temperatures, e.g. use maintained mode, polished reflector, dense diffuser; and		P
	(b) the luminaire or exit sign selected for the low temperature test represents the form that will produce the lowest internal temperatures, e.g. use non-maintained mode, diffuse reflector, operate without diffuser		P
	Where there is doubt about which luminaire or exit sign should be selected in accordance with Items (a) and (b), each luminaire or exit		P

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
	sign in the range shall be operated at ambient temperature of 25 ±2°C and the internal temperatures measured adjacent to the battery, until stable temperature conditions are attained.		
D1.2	General conditioning		P
	The three cycles of each test procedure shall follow sequentially in the order specified. The interval between successive cycles shall not exceed 12 h, during which time the ambient temperature shall be maintained at the specified value		P
	The battery voltage shall be monitored continuously throughout each cycle. All other parameters shall be monitored at intervals of not more than 5 min.		P
	For the purpose of the tests, the ambient temperature shall be taken as the dry bulb temperature reading within the test room or enclosure under still air conditions. During measurement, the temperature sensing element shall be shielded from radiation from the luminaire or exit sign under test.		P
	All voltage measurements shall be taken while the battery is being charged or discharged		P
D2	**LIGHT OUTPUT**		**P**
	In addition to complying with this Appendix, each design/type of self-contained emergency luminaire and dual function exit sign shall be tested in accordance with the requirements of Appendix C and assigned an appropriate classification. Self-contained internallyilluminated exit signs shall provide luminance values in accordance with the requirements of Clause 3.4.2. For photometric measurements, the test voltage and current shall be as follows:		P
	(a) The test voltage shall be the lowest battery voltage measured in any of the discharge cycles specified in Tables D1 and D2, after operation for the initial duration of operation specified in Section 2 of AS/NZS 2293.1.		P
	(b) The discharge current delivered to the luminaire shall be recorded when operated at an ambient temperature of 25°C. The batteries shall be disconnected and replaced by a separate d.c. power supply at the test voltage determined in accordance with Item (a). The luminaire shall be orientated in its intended mounting position and the discharge current		P

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
	shall be recorded when stable.		
D3	**LED OPERATING CONDITION TEST**		**P**
	The LED(s) used in emergency luminaires and exit signs shall be tested in order to verify that the operating condition of the LEDs are, as a minimum, within the parameters of the LM80 test report for maintained luminaires and exit signs, and manufacturer's limits for non-maintained luminaires (and in New Zealand non-maintained exit signs).		P
	The attachment point of the fine wire thermocouple shall be as defined in the IES LM80 report for the emergency LED in question.		P
	For maintained emergency luminaires and exit signs, when the luminaire is tested at an ambient temperature of 40°C, the LED case temperature (*T*s) and the LED drive current shall be measured. These measurements shall not exceed those values as given in the IES LM80 report.	For manual test function	P
	For non-maintained emergency luminaires (and in New Zealand non-maintained exit signs) when the luminaire is tested at an ambient temperature of 40°C the LED *T*s point temperature and the LED drive current shall be measured. These measurements shall not exceed those values as specified by the LED chip manufacturer.	For automatic test function	P
D4	**BATTERY CHARGER SHORT CIRCUIT TEST**		**P**
	Each design/type of self-contained emergency escape luminaire and exit sign shall be tested under the following conditions		P
	(a) The test shall be conducted in an ambient temperature of 40±2°C.		P
	(b) The emergency escape luminaire or exit sign shall be connected to a 50 Hz a.c. supply at 106% of the rated voltage.		P
	(c) The battery shall be disconnected and a short circuit of negligible impedance applied in place of the battery.		P
	The test shall be continued for a period of 24 h and, during the test, there shall be no emission of flames nor molten material nor production of flammable gases. In addition, enclosures shall not have deformed to the extent that access to live parts is made possible by use of the standard test finger, as specified in AS/NZS 60598.1.		P
	The battery charger need not be capable of		P

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
	normal operation after the completion of the test but failure of any component shall not affect conformance with the above.		
D5	**TEST FOR AUTOMATIC DISCHARGE TEST FACILITIES**		**P**
	Emergency escape luminaires and exit signs that are provided with self contained or centralized facilities for automatic discharge testing shall be subjected to the following additional test; the test shall be conducted at an ambient temperature of 25 ±5°C:		P
	(a) Connect the emergency escape luminaire or exit sign to the supply at rated voltage for a period of 16 h.		P
	(b) Initiate the automatic discharge test facility and independently monitor the elapsed time and light output.		P
	(c) Check that the time taken for the completion of the test and restoration of normal conditions conforms to the general system requirement in Section 4 of AS 2293.1.		P
	(d) Check that correct indication of operational status is provided both during and after the discharge test.		P
	(e) Simulate each of the following conditions, in turn, and check that the correct indications of operational status are provided:		P
	(i) Operation of the battery low voltage cut off.		P
	(ii) Failure of the emergency lamp(s).		P
APPENDIX E	**PROJECTION OF LIGHT SOURCE LIFE (LSL) IN LED EXIT SIGNS**		**P**
E1	**PURPOSE**		**P**
E1.1	BASIS OF PROJECTION		P
	The system described in this Appendix is for the projection of light source life in LED exit signs based on IES TM-21 methodology. It uses luminance data recorded as part of Clause 3 of this Standard, LED case temperature Ts and LED drive current recorded as part of Appendix D tests and LM-80 test report data for the LED employed. These are used as inputs in calculating the projected lumen depreciation life in exit signs.		P
E2	**BASIS OF PROJECTION**		**P**
E3	**DATA REQUIRED**		**P**
	The following data is required to calculate the light source life:		P

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
	(a) The minimum luminance recorded for the green background (hereafter referred to as LGmin).		P
	(b) The minimum luminance recorded for the white foreground (hereafter referred to as LWmin).		P
	(c) The LED case temperature Ts measured in Appendix D.		P
	(d) The applicable IES LM-80 report for the LED employed.		P
E4	**METHOD TO DETERMINE LIGHT SOURCE LIFE**		**P**
E4.1	CALCULATION OF THE MINIMUM FACE LUMINANCE FACTOR		P
E4.2	CALCULATION OF THE MINIMUM FACE LUMINANCE FACTOR		P
	The maximum maintenance factor is the higher value calculated from both the formulae below: 8/LGmin = green background luminance factor × 100; 32/LWmin = white foreground luminance factor × 100		P
	The green background luminance factor is— 8/12 × 100 = 67; Therefore L67 is applicable to green		P
	The white background luminance factor is— 32/60 × 100 = 53; Therefore L53 is applicable to white.		P
	The maximum value is used in the light source life calculations. This is 67 or L67.		P
E4.3	CALCULATION OF THE LIGHT SOURCE LIFE		P
	A recognized IES TM-21 calculation spreadsheet shall be used to perform the calculation. The procedure shall be as follows:		P
	Enter the appropriate edata into the spreadsheet. This includes the—		P
	(a) LM-80 data for the LED being assessed;		P
	(b) LED Ts temperature measured; and		P
	(c) operating current.		P
	In the spreadsheet results table:		P
	(i) Vary the time (*t*) which estimates lumen maintenance hours (in steps of 1000 hours min) until the Lumen maintenance at time (*t*)%' is within ±2 of the value calculated in E4.1.		P
	(ii) Time (*t*) is the light source life in operating		P

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict
	hours. Convert time (*t*) to an xxY/xxM format by rounding up or down to the nearest whole month.		
	(iii) Include this value in the test report for Clause 3 requirements and express as 'Light source life = xxY/xxM'.		P

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict

Appendix 1: Test Data Table

ILLUMINATION AT SWITCH ON

The emergency escape luminaire/exit sign described on this report was tested in accordance with Clause 2.3/Clause 3.5.1 of AS 2293.3, and the results were as follows:

Measured parameter	Cold start	Hot start
Light output after 1s	Pass	Pass
Light output after 15 s	Pass	Pass

Nominal battery voltage: 6.4VDC; Test voltage: 6.45VDC (For lowest voltage measured from discharge cycle No.1 of battery high temperature test)

PHOTOMETRY

The emergency luminaire/exit sign described on this report was tested in accordance with Appendix C of AS 2293.3. The results were as follows:

Test voltage: 6.45VDC, for self-contained emergency luminaires/exit signs, measured current: 265mA

Abridged intensity data (for luminaire classification):

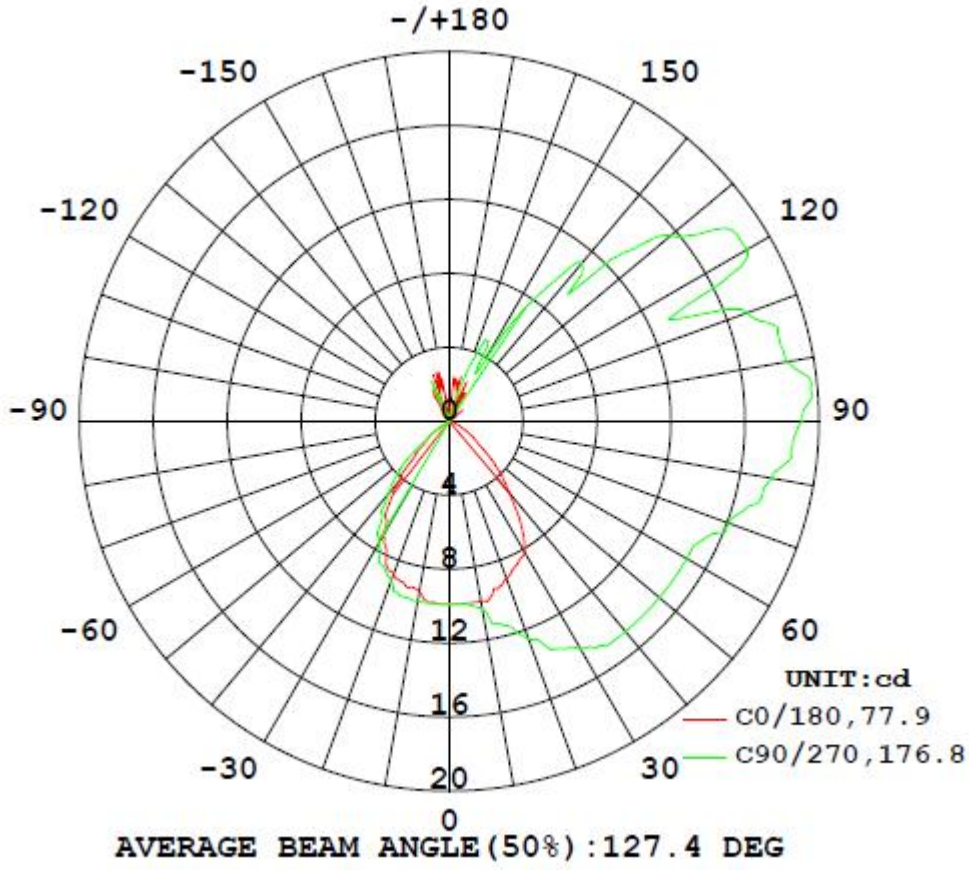
For model DS-ES-04M

Vertical angel γ degree	Luminous intensity (measured), cd	
	C0 Plane	C90 Plane
0	9.89	9.89
5	9.89	9.89
10	9.89	10.3
15	9.36	11.4
20	9.05	12.5
25	8.59	13.6
30	8.21	14.2
35	6.76	14.8
40	5.06	14.8
45	3.84	14.8
50	2.53	14.8
55	1.61	14.8
60	1.15	14.8
65	0.62	15.1
70	0.31	16.1

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict

Luminous intensity distribution diagram:



Curve A: C0 plane, curve B: C90 plane

Performance Summary		Emergency Classification	
Luminous Flux	64.5382 lm	C_0	D0.32
Luminous Power	1.71 W	C_{90}	D8
Luminous Efficacy	37.74 lm/W		

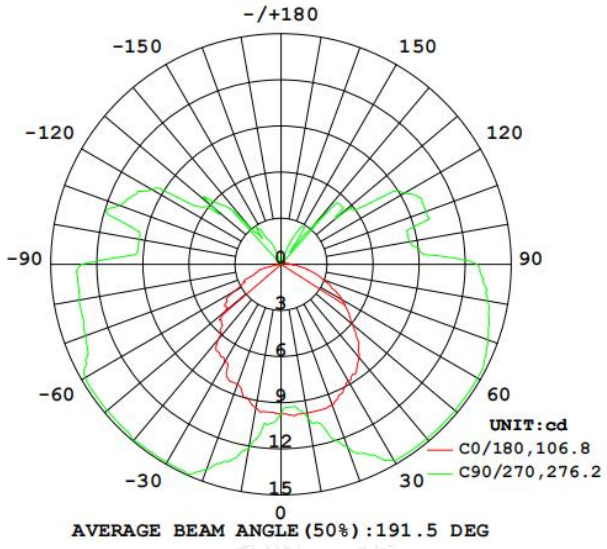
Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict

For model DS-ES-01M/DS-ES-02M

Vertical angel γ degree	Luminous intensity (measured), cd	
	C0 Plane	C90 Plane
0	9.73	9.73
5	9.89	9.30
10	9.81	10.1
15	9.81	11.0
20	9.81	12.6
25	9.30	13.7
30	8.80	14.8
35	8.54	14.8
40	7.87	14.8
45	7.19	14.8
50	6.09	14.8
55	5.33	14.8
60	4.57	14.8
65	3.64	14.6
70	2.96	14.3

Luminous intensity distribution diagram:



Curve A: C0 plane, curve B: C90 plane

Performance Summary		Emergency Classification	
Luminous Flux	94.3685 lm	C_0	D3.2
Luminous Power	1.71 W	C_{90}	D8
Luminous Efficacy	55.18 lm/W		

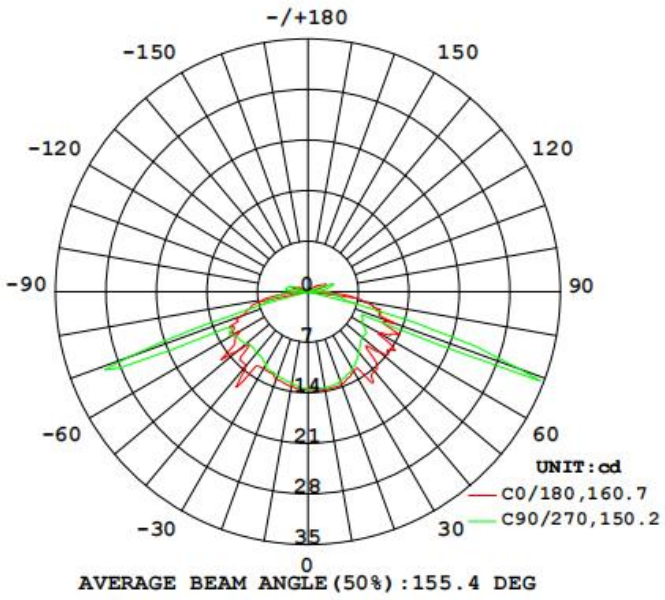
Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict

For model DS-ES-03M

Vertical angel γ degree	Luminous intensity (measured), cd	
	C0 Plane	C90 Plane
0	13.6	13.6
5	13.7	13.5
10	13.7	13.5
15	13.7	13.4
20	13.6	13.1
25	13.2	12.7
30	12.8	12.3
35	15.4	11.7
40	14.4	11.0
45	12.6	10.3
50	12.8	9.91
55	14.0	9.91
60	11.2	8.76
65	14.1	8.16
70	13.0	9.85

Luminous intensity distribution diagram:



Curve A: C0 plane, curve B: C90 plane

Performance Summary		Emergency Classification	
Luminous Flux	67.9673 lm	C_0	D12.5
Luminous Power	1.71 W	C_{90}	D10
Luminous Efficacy	39.747 lm/W		

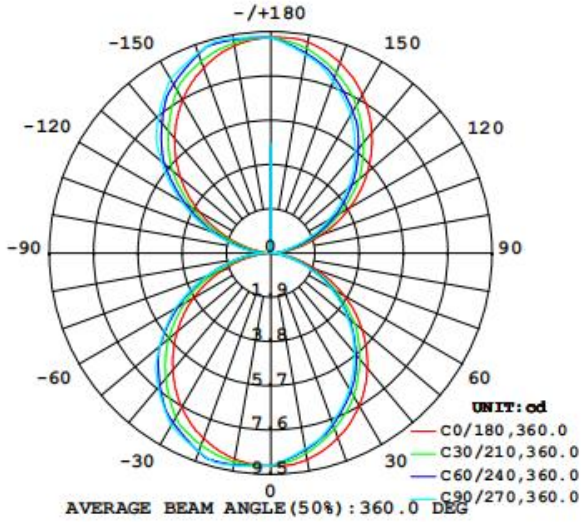
Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict

For model DS-ES-05M

Vertical angel γ degree	Luminous intensity (measured), cd	
	C0 Plane	C90 Plane
0	9.13	9.13
5	9.13	8.83
10	8.99	8.53
15	8.76	8.23
20	8.43	7.74
25	8.05	7.25
30	7.58	6.77
35	7.04	6.17
40	6.45	5.58
45	5.81	4.99
50	5.13	4.31
55	4.39	3.62
60	3.63	2.94
65	2.84	2.25
70	2.06	1.57

Luminous intensity distribution diagram:



Curve A: C0 plane, curve B: C90 plane

Performance Summary		Emergency Classification	
Luminous Flux	50.055 lm	C_0	D2.5
Luminous Power	1.71 W	C_{90}	D2.0
Luminous Efficacy	29.27 lm/W		

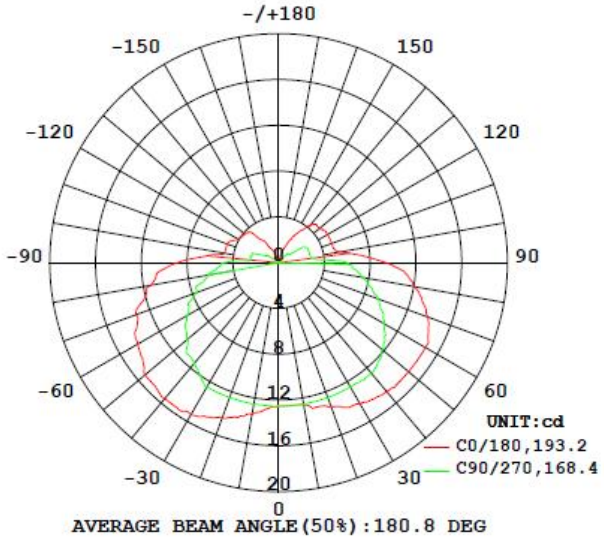
Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict

For model DS-ES-06M

Vertical angel γ degree	Luminous intensity (measured), cd	
	C0 Plane	C90 Plane
0	12.5	12.5
5	12.5	12.5
10	12.6	12.5
15	13.0	12.5
20	13.3	12.5
25	13.9	12.5
30	14.3	12.5
35	14.5	12.5
40	14.7	12.6
45	14.8	12.3
50	14.8	11.8
55	14.8	11.3
60	14.8	10.6
65	14.5	9.95
70	13.9	9.25

Luminous intensity distribution diagram:



Curve A: C0 plane, curve B: C90 plane

Performance Summary		Emergency Classification	
Luminous Flux	93.3479 lm	C_0	D10
Luminous Power	1.71 W	C_{90}	D10
Luminous Efficacy	54.59 lm/W		

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict

BATTERY (APPENDIX D):

For model DS-ES-04M

Battery specifications:

Maximum charge current:	1600mA	Maximum discharge current:	1600mA
Minimum charge current:	150mA	Minimum discharge voltage:	5.20V
Maximum charge voltage:	3.65V	Maximum battery case temperature:	55℃

The self-contained emergency escape luminaire/exit sign described on this report was tested in accordance with Appendix D of AS 2293.3, and the results were as follows:

Mounting: surface mounting on horizontal, Operation: Maintained.

High temperature test(40°C±2°C), Charge cycle

Measured parameter	Charge cycle No. 1	Charge cycle No. 2	Charge cycle No. 3
Maximum battery voltage(V)	6.72	6.65	6.71
Maximum battery current(A)	0.113	0.108	0.120
Max. Battery/ case temp.(°C)	45.4	45.1	45.5

High temperature test(40°C±2°C), Discharge cycle

Measured parameter	Discharge cycle No. 1	Discharge cycle No. 2	Discharge cycle No. 3
Maximum battery current (A)	0.341	0.350	0.345
Battery current at 2h (A)	0.265	0.260	0.258
Battery voltage at 2h (V)	6.45	6.49	6.48
Battery volts at cut off (V)	5.59	5.58	5.60
Cut of occurred at	4 hours 39min	4 hours 50min	4 hours 46min
Battery drain current(A)	0.002	0.003	0.002

Low temperature test(10°C±2°C), Charge cycle

Measured parameter	Charge cycle No. 1	Charge cycle No. 2	Charge cycle No. 3
Maximum battery voltage(V)	6.68	6.70	6.72
Maximum battery current(A)	0.115	0.110	0.118
Max. Battery/ case temp.(°C)	12.5	12.7	12.4

Low temperature test(10°C±2°C), Discharge cycle

Measured parameter	Discharge cycle No. 1	Discharge cycle No. 2	Discharge cycle No. 3
Maximum battery current (A)	0.339	0.345	0.343
Battery current at 2h (A)	0.261	0.263	0.259
Battery voltage at 2h (V)	6.45	6.56	6.50
Battery volts at cut off (V)	5.60	5.67	5.68
Cut of occurred at	4 hours 38min	4 hours 45min	4 hours 47min
Battery drain current(A)	0.002	0.003	0.002

Test data for both high temperature and low temperature tests:

(a) Emergency lamps illuminated continuously Yes

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict

(b) Emergency lamps reconnected after cut off	Yes
(c) Battery current after cut off in accordance with recommendation of cell manufacturer	Yes
(d) Temperatures of materials and components within the scope of AS/NZS 3100 and AS 3137	Pass
(e) Maximum temperature of battery or battery case	45.5°C
(f) Test voltage for photometric tests	6.45V
Battery charger short circuit test	Pass

Accuracy: The uncertainties were not greater than 1%.

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict

DIMENSIONS AND ILLUMINATION, COLOUR (EXIT SIGNS):

For model DS-ES-04M

Luminance (cd / sq.m)

Maximum Luminance in White	**508.6 cd/sq.m**			
Maximum Luminance in Green	**128.1 cd/sq.m**			
Minimum Luminance in White	**290.2 cd/sq.m**			
Minimum Luminance in Green	**40.4 cd/sq.m**			
White Measured CIE (x,y) 1931 co-ords	**X**	**0.2814**	**Y**	**0.4621**
Green Measured CIE (x,y) 1931 co-ords	**X**	**0.3054**	**Y**	**0.3244**
Tabulated measurements of single element performed in the C0 direction				

Tabulated worst case results for the pictorial element(s) present

(Compliance criteria for standard pictogram elements)

Clause	Requirement	Requirement	Measured
3.4.2 (a)	Minimum luminance of the green area in the pictorial element	Not less than 8 cd/sq.m	40.4
	Minimum luminance ratio LC60: LC0 expressed as a percentage.	Not less than 10%	89%
3.4.2 (b)	Minimum luminance ratio of adjacent white area to green area in the pictorial element.	Not less than 4:1	Min. 4.12:1
3.4.2 (c)	Maximum luminance ratio of any two white areas in the pictorial element.	Not more than 5:1	Max.1.75:1
	Maximum luminance ratio of any two green areas in the pictorial element.	Not more than 5:1	Max.3.17:1
3.4.2 (d)	Minimum luminance of the additional green background.	Not less than 8 cd/sq.m	N/A

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict

For model DS-ES-01M/DS-ES-02M

Luminance (cd / sq.m)

Maximum Luminance in White	**588.28 cd/sq.m**			
Maximum Luminance in Green	**137.06 cd/sq.m**			
Minimum Luminance in White	**481.93 cd/sq.m**			
Minimum Luminance in Green	**63.42 cd/sq.m**			
White Measured CIE (x,y) 1931 co-ords	**X**	**0.3142**	**Y**	**0.3177**
Green Measured CIE (x,y) 1931 co-ords	**X**	**0.2300**	**Y**	**0.4894**
Tabulated measurements of single element performed in the C0 direction				

Tabulated worst case results for the pictorial element(s) present

(Compliance criteria for standard pictogram elements)

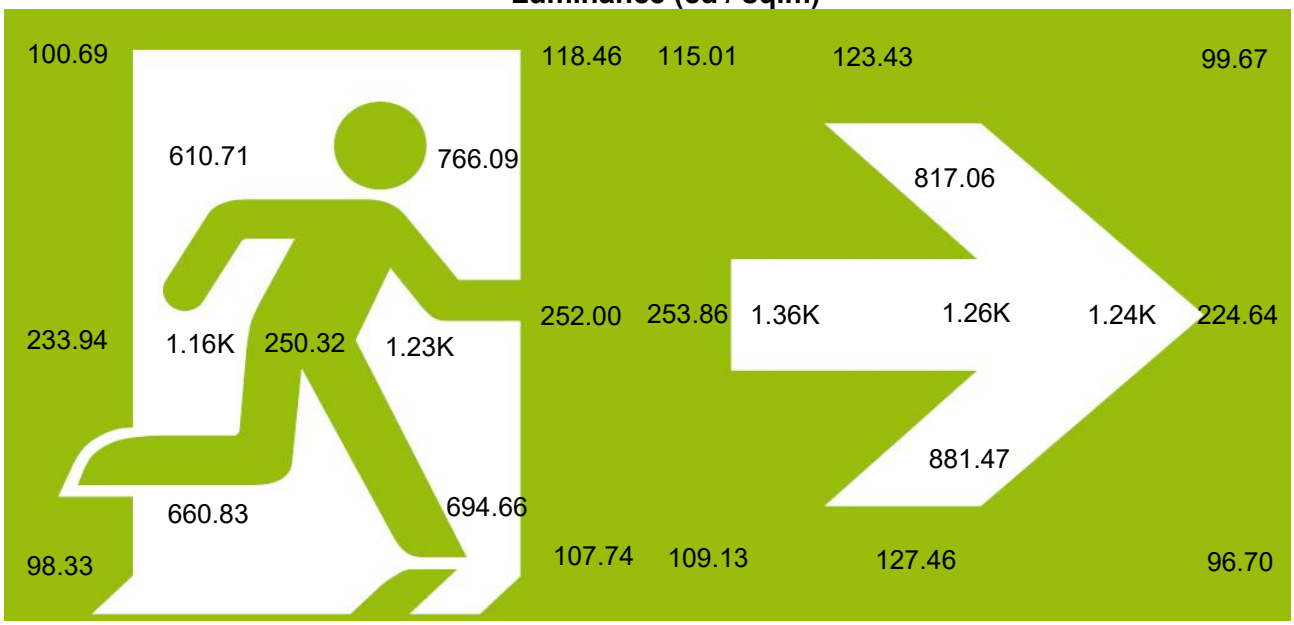
Requirement	Requirement	Measured
Minimum luminance of the green area in the pictorial element	Not less than 8 cd/sq.m	63.42
Minimum luminance ratio LC60: LC0 expressed as a percentage.	Not less than 10%	85%
Minimum luminance ratio of adjacent white area to green area in the pictorial element.	Not less than 4:1	Min:4.663:1
Maximum luminance ratio of any two white areas in the pictorial element.	Not more than 5:1	Max:1.220:1
Maximum luminance ratio of any two green areas in the pictorial element.	Not more than 5:1	Max:2.161:1
Minimum luminance of the additional green background.	Not less than 8 cd/sq.m	N/A

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict

For model DS-ES-03M

Luminance (cd / sq.m)



Maximum Luminance in White	**1.36K cd/sq.m**			
Maximum Luminance in Green	**253.86 cd/sq.m**			
Minimum Luminance in White	**610.71 cd/sq.m**			
Minimum Luminance in Green	**96.70 cd/sq.m**			
White Measured CIE (x,y) 1931 co-ords	**X**	**0.3283**	**Y**	0.3535
Green Measured CIE (x,y) 1931 co-ords	**X**	**0.2620**	**Y**	0.4761
Tabulated measurements of single element performed in the C0 direction				

Tabulated worst case results for the pictorial element(s) present

(Compliance criteria for standard pictogram elements)

Clause	Requirement	Requirement	Measured
3.4.2 (a)	Minimum luminance of the green area in the pictorial element	Not less than 8 cd/sq.m	96.70
	Minimum luminance ratio LC60: LC0 expressed as a percentage.	Not less than 10%	85%
3.4.2 (b)	Minimum luminance ratio of adjacent white area to green area in the pictorial element.	Not less than 4:1	Min:4.63:1
3.4.2 (c)	Maximum luminance ratio of any two white areas in the pictorial element.	Not more than 5:1	Max:2.22:1
	Maximum luminance ratio of any two green areas in the pictorial element.	Not more than 5:1	Max:2.62:1
3.4.2 (d)	Minimum luminance of the additional green background.	Not less than 8 cd/sq.m	N/A

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict

For model DS-ES-05M

Luminance (cd / sq.m)

Maximum Luminance in White	**205.59 cd/sq.m**			
Maximum Luminance in Green	**49.44 cd/sq.m**			
Minimum Luminance in White	**100.41 cd/sq.m**			
Minimum Luminance in Green	**19.42 cd/sq.m**			
White Measured CIE (x,y) 1931 co-ords	**X**	**0.3251**	**Y**	**0.3773**
Green Measured CIE (x,y) 1931 co-ords	**X**	**0.3852**	**Y**	**0.4974**
Tabulated measurements of single element performed in the C0 direction				

Tabulated worst case results for the pictorial element(s) present

(Compliance criteria for standard pictogram elements)

Clause	Requirement	Requirement	Measured
3.4.2 (a)	Minimum luminance of the green area in the pictorial element	Not less than 8 cd/sq.m	19.42
	Minimum luminance ratio LC60: LC0 expressed as a percentage.	Not less than 10%	64%
3.4.2 (b)	Minimum luminance ratio of adjacent white area to green area in the pictorial element.	Not less than 4:1	Min:4.07:1
3.4.2 (c)	Maximum luminance ratio of any two white areas in the pictorial element.	Not more than 5:1	Max:2.04:1
	Maximum luminance ratio of any two green areas in the pictorial element.	Not more than 5:1	Max:2.54:1
3.4.2 (d)	Minimum luminance of the additional green background.	Not less than 8 cd/sq.m	N/A

Attachment No.10

AS/NZS 2293.3:2018+A1:2021			
Clause	Requirement + Test	Result - Remark	Verdict

For model DS-ES-06M

Luminance (cd / sq.m)

Maximum Luminance in White	**456.128 cd/sq.m**			
Maximum Luminance in Green	**49.925cd/sq.m**			
Minimum Luminance in White	**107.886 cd/sq.m**			
Minimum Luminance in Green	**12.546cd/sq.m**			
White Measured CIE (x,y) 1931 co-ords	**X**	**0.3105**	**Y**	**0.3240**
Green Measured CIE (x,y) 1931 co-ords	**X**	**0.3465**	**Y**	**0.3785**
Tabulated measurements of single element performed in the C0 direction				

Tabulated worst case results for the pictorial element(s) present

(Compliance criteria for standard pictogram elements)

Clause	Requirement	Requirement	Measured
3.4.2 (a)	Minimum luminance of the green area in the pictorial element	Not less than 8 cd/sq.m	12.546
	Minimum luminance ratio LC60: LC0 expressed as a percentage.	Not less than 10%	70%
3.4.2 (b)	Minimum luminance ratio of adjacent white area to green area in the pictorial element.	Not less than 4:1	Min. 5.020:1
3.4.2 (c)	Maximum luminance ratio of any two white areas in the pictorial element.	Not more than 5:1	Max.4.228:1
	Maximum luminance ratio of any two green areas in the pictorial element.	Not more than 5:1	Max.3.98:1
3.4.2 (d)	Minimum luminance of the additional green background.	Not less than 8 cd/sq.m	N/A

Attachment No.11

Photo Documentation

Model: DS-ES-01S

Photo 1

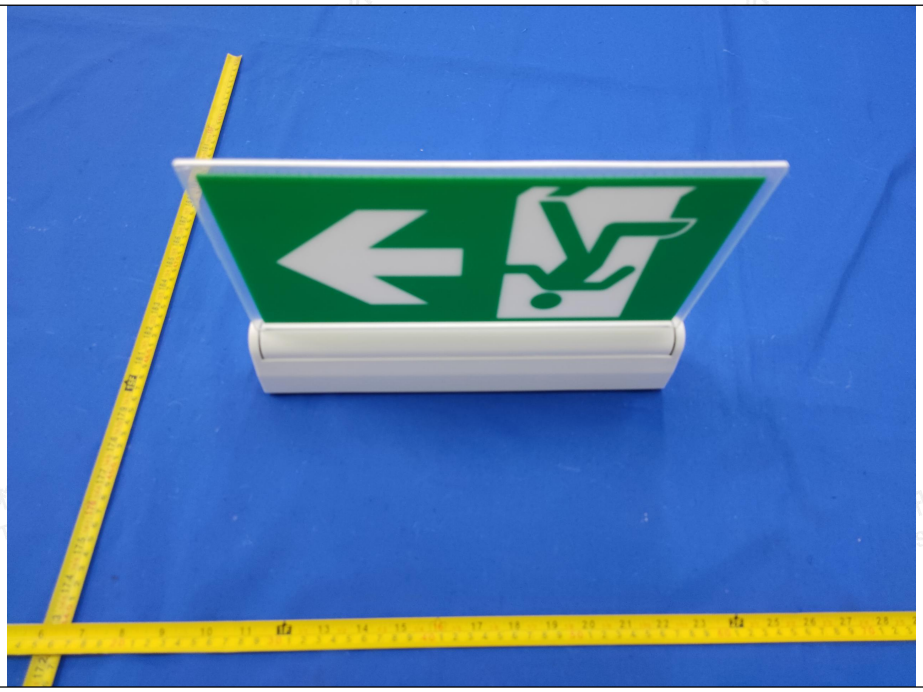


Photo 2

Attachment No.11

Photo Documentation

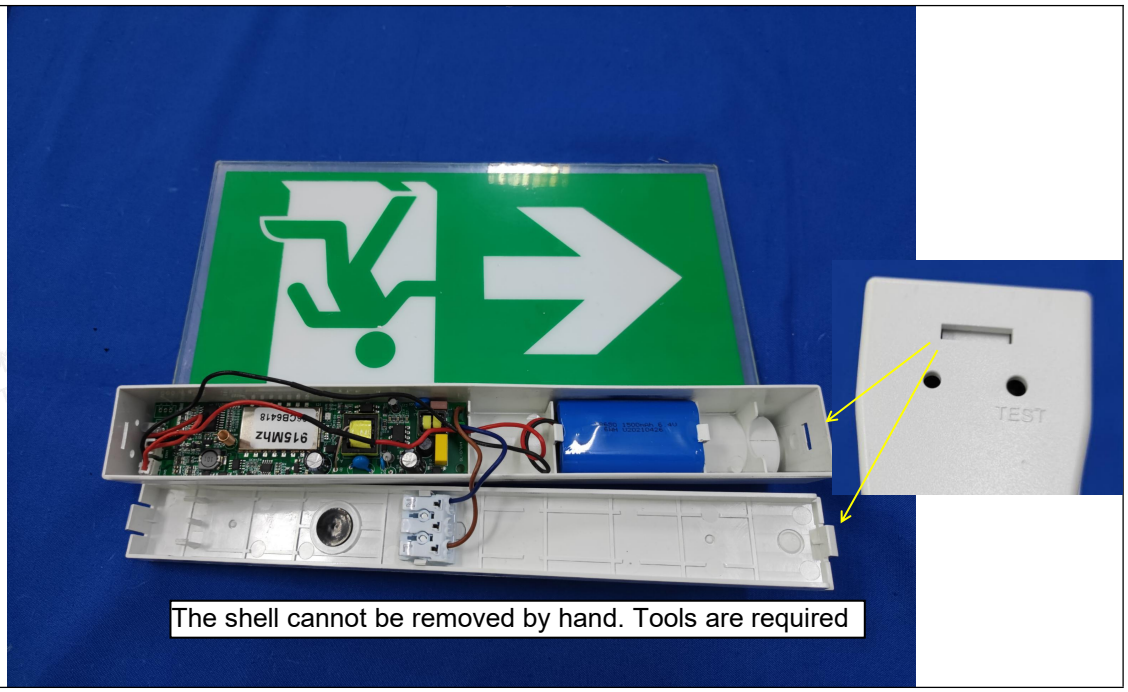


Photo 3

Photo 4

Attachment No.11

Photo Documentation

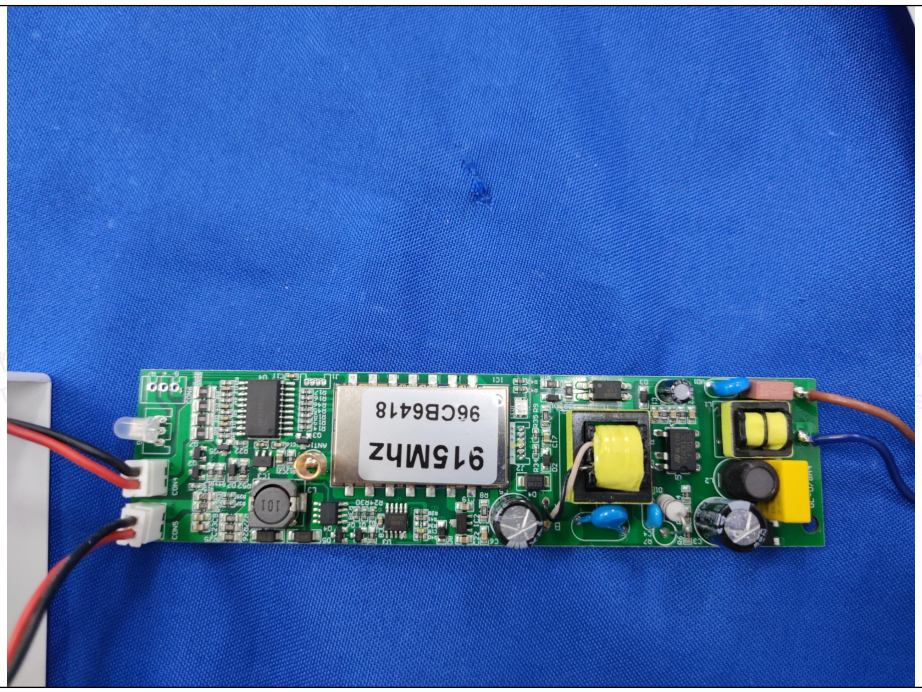


Photo 5

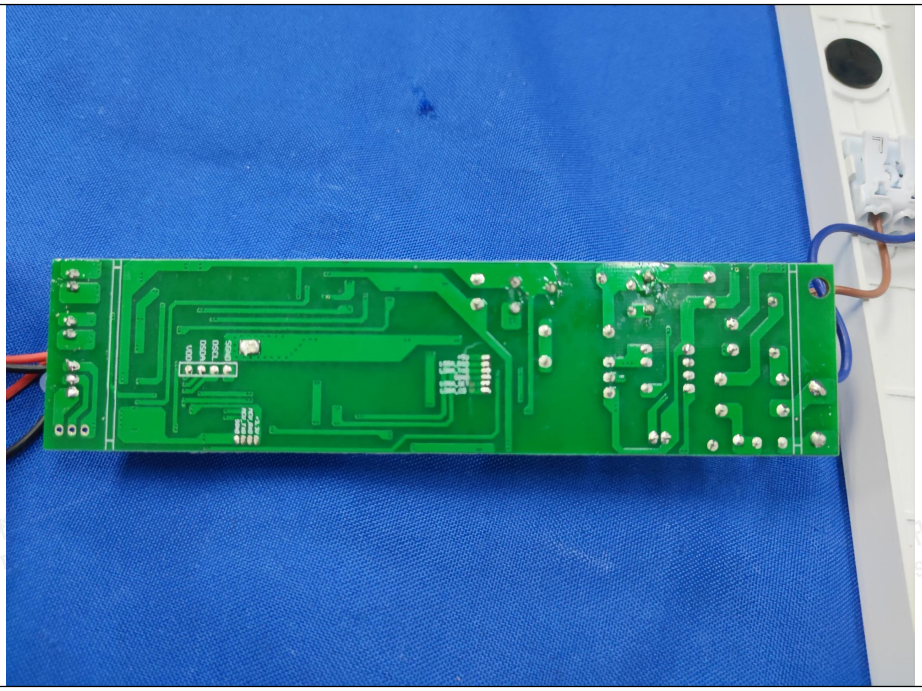


Photo 6

Attachment No.11

Photo Documentation

Photo 7

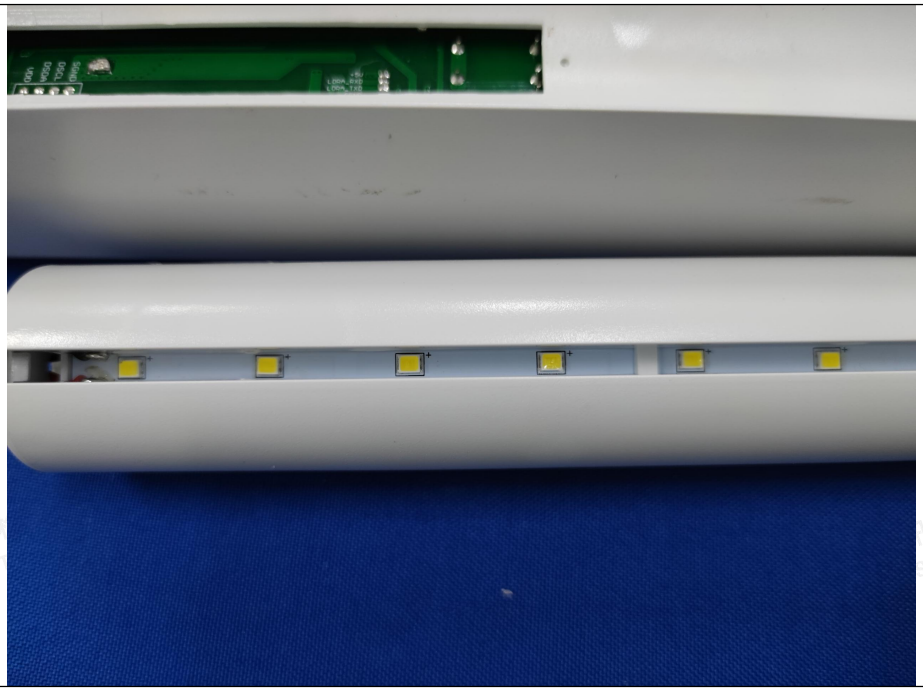


Photo 8

Attachment No.11

Photo Documentation

Model: DS-ES-02S

Photo 9

Model: DS-ES-03S

Photo 10

Attachment No.11

Photo Documentation

Model: DS-ES-04S

Photo 11

Model: DS-ES-05S

Photo 12

Attachment No.11

Photo Documentation

Model: DS-ES-06S

Photo 13

----------End of Test Report----------