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

Report Number. .....:	423896
Date of issue .....:	2022-03-24
Total number of pages .....:	173 (Including attachments)
Name of Testing Laboratory preparing the Report.....:	Nemko Shanghai Ltd. Shenzhen Branch
Applicant's name.....:	SPARKELEC PTY LTD
Address .....:	56 Parramatta Rd Croydon NSW 2132, Sydney, Australia
Test specification:	
Standard.....:	IEC 60598-2-22:2014, AMD1:2017 used in conjunction with IEC 60598-1:2014, AMD1:2017
Test procedure .....:	CB Scheme
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

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
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Test item description ..... :	LED lighting lamps and lanterns with emergency lighting
Trade Mark ..... :	SPARKELEC
Manufacturer ..... :	Same as Applicant
Model/Type reference ..... :	**SPxxxxyy-zz**
Ratings ..... :	Charging mode: 220-240 VAC, 50/60 Hz, 4 W. Emergency lighting mode: LiFePO4 battery, 3.2 V d.c., 1500 mAh. Class II, IP20, ta: 25 °C - +40 °C, Maintained, 3 hours duration.

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☒	**CB Testing Laboratory:**	Nemko Shanghai Ltd. Shenzhen Branch	
Testing location/ address.....:		Unit CD, Floor 2 & Floor 10, Tower 2, Kefa Road 8#, Hi-Technology Park, Nanshan District, Shenzhen, Guangdong, China	
Tested by (name, function, signature).....:		Emily Zeng (Project handler)	
Approved by (name, function, signature)...:		Benny Lan (Verificator)	
☐	**Testing procedure: CTF Stage 1:**		
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 2:**		
Testing location/ address.....:			
Tested by (name + signature).....:			
Witnessed by (name, function, signature) .:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 3:**		
☐	**Testing procedure: CTF Stage 4:**		
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Witnessed by (name, function, signature) .:			
Approved by (name, function, signature)...:			
Supervised by (name, function, signature) :			

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

Attachment 1: European Group Differences and National Differences (2 pages)
Attachment 2: National Differences for Australia according to AS/NZS 60598.1:2017+A1:2017+A2:2020 and AS 60598.2.22:2019 (15 pages)
Attachment 3: Additional test according to IEC 60598-2-2(ed.3):2011 and EN 60598-2-2:2012 (1 page)
Attachment 4: National Differences for Australia according to AS/NZS 60598.2.2:2016 (11 pages)
Attachment 5: Additional test according to IEC 61347-2-7:2011+A1:2017 used in conjunction with IEC 61347-1:2015 +A1:2017 and EN 61347-2-7:2012 used in conjunction with EN 61347-1: 2015 +A1:2021 (29 pages)
Attachment 6: Additional test according to AS/NZS 61347.1:2016 + A1:2018 and AS 61347.2.7:2019 (14 pages)
Attachment 7: Creepage distance and clearance of integral controlgear (2 pages)
Attachment 8: Additional tests for LED module according to IEC 62031:2018 and EN IEC 62031:2020 (8 pages)
Attachment 9: Photo-biological hazards according to IEC/TR 62778: 2014 (4 pages)
Attachment 10: Pictures (28 pages)
Attachment 11: Circuit diagram and PCB layout (3 pages)
Attachment 12: Transformer Specification (2 pages)

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
The below clauses as far as applicable. 22.4 (0) – General test requirements 22.5 (2) – Classification 22.6 (3) – Marking 22.7 (4) – Construction 22.10 (15) – Terminals 22.8 (11) – Creepage distances and clearance 22.11 (5) – External and internal wiring 22.12 (8) – Protection against electric shock 22.13 (12) – Endurance test and thermal test 22.14 (9) – Resistance to dust and moisture 22.15 (10) – Insulation resistance and electric strength 22.16 (13) – Resistance to heat, fire and tracking 22.17 (-) – Photometric data 22.18 (-) – Changeover operation 22.19 (-) – High temperature operation 22.20 (-) – Battery chargers for self-contained emergency luminaire 22.21 – Test devices for emergency operation Annex A – Batteries for emergency luminaires Annex B – Luminaire classification Annex C – Luminaire measurements	Nemko Shanghai Ltd. Shenzhen Branch Unit CD, Floor 2 & Floor 10, Tower 2, Kefa Road 8#, Hi-Technology Park, Nanshan District, Shenzhen, Guangdong, China

Summary of compliance with National Differences:

List of countries addressed

- CENELEC member countries
- Australia and New Zealand

☒ The product fulfils the requirements of EN 60598-2-22:2014 + A1:2020 used in conjunction with EN 60598-1:2015 +A1:2018.

☒ The product fulfils the requirements of AS 60598.2.22:2019 used in conjunction with AS/NZS 60598.1:2017+A1:2017+A2:2020.

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.

Representative:

Label for luminaire:

SPARKELEC

LED lighting lamps and lanterns with emergency lighting
SPARKELEC PTY LTD
Model No.: SP2001DA-WH
Input:220-240 VAC, 50/60 Hz
Power consumption: 4W
CAUTION-See instruction manual for installation, Operating and maintenance instructions.
Replace battery with LiFePO4 3.2V 1500mAh

X	1	AG	180

Notice-Suitable for dry location. For use in 25 °C - 40 °C ambient temperature.

Made in China

Note: All models have same label, only differ in model name.

(For model SP2002yy-zz series, Attached on the surface of enclosure for Australia and New Zealand market only)

For European market, the manufacturer name & address, importer name & address will be pasted on the products.

Manufacturer: SPARKELEC PTY LTD
Address: 56 Parramatta Rd Croydon NSW 2132, Sydney, Australia

Label for battery:

Lithium battery 3.2 V⎓1.5 Ah
Replace battery 4 years after installation.

Max. Ambient temperature: 45 °C
Installed date:
Manufactured date:

Calibration	All instruments used in the tests given in this test report are calibrated and traceable to national or international standards. Further information about traceability will be given on request.
Measurement uncertainty	Measurement uncertainties are calculated for all instruments and instrument set-ups given in this report. Calculations are based on the principles given in the standard EA-4/02 (Dec. 1999), IEC Guide 115:2007 and other relevant internal Nemko-procedures. Further information about measurement uncertainties will be given on request.
Evaluation of results	If not explicitly stated otherwise in the standard, the test is passed if the measured value is equal to or below (above) the limit line, regardless of the measurement uncertainty. If the measured value is above (below) the limit line, the test is not passed - ref IEC Guide 115:2007. The instrumentation accuracy is within limits agreed by IECEE-CTL.

Test item particulars.....:	
Classification of installation and use.....:	For SP2001yy-zz and SP2003yy-zz: Fixed mounting, For SP2002yy-zz: Recessed mounting
Supply Connection.....:	Screw terminal for SP2001yy-zz and SP2003yy-zz Supply cord with plug for SP2002yy-zz
.....:	
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A (Not applicable)
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing.....:	
Date of receipt of test item .....:	2021-05-22
Date (s) of performance of tests.....:	2021-05-22 to 2022-01-28
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. **Throughout this report a ☐ comma / ☒ point is used as the decimal separator.** **Clause numbers between brackets refer to clauses in IEC 60598-1.**	
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).....:	Removed

General product information:

The emergency luminaires only used for emergency exit sign purpose.

SPxxxxyy-zz series:

The “xxxx” in the type designation can be 2001, 2002, 2003, indicating different enclosure.
The “yy” can be DA or FE, indicating different function.
DA is manual test with DALI function, FE is manual test without DALI function.
The “zz” can be WH or BK, indicating different enclosure / exit signs colour.
WH: white, BK: black.

Model list:

Model name	Ratings and characteristics	Installation	Enclosure colour
SP2001DA-WH	4 W, 3 hours duration, LiFePO4 battery 3.2 V, 1.5 Ah; Maintained, manual test & DALI.	Ceiling mounting & wall mounting	White
SP2001DA-BK			Black
SP2001FE-WH	4 W, 3 hours duration, LiFePO4 battery 3.2 V, 1.5 Ah; Maintained, manual test.		White
SP2001FE-BK			Black
SP2003DA-WH	4 W, 3 hours duration, LiFePO4 battery 3.2 V, 1.5 Ah; Maintained, manual test & DALI.	Ceiling mounting & wall mounting	White
SP2003DA-BK			Black
SP2003FE-WH	4 W, 3 hours duration, LiFePO4 battery 3.2 V, 1.5 Ah; Maintained, manual test.		White
SP2003FE-BK			Black
SP2002DA-WH	4 W, 3 hours duration, LiFePO4 battery 3.2 V, 1.5 Ah; Maintained, manual test & DALI.	Recessed mounting	White
SP2002DA-BK			Black
SP2002FE-WH	4 W, 3 hours duration, LiFePO4 battery 3.2 V, 1.5 Ah; Maintained, manual test.		White
SP2002FE-BK			Black

Model difference:

All models have the same parameters and similar construction.
The emergency driver of SP2001yy-zz and SP2003yy-zz have same circuit diagram, same PCB layout and same transformer.
The emergency driver of SP2001yy-zz and SP2002yy-zz have same circuit diagram and same transformer, only differ in PCB layout.
The emergency driver of SPxxxxDA-zz is identical to the emergency driver of SPxxxxFE-zz, only differ in the emergency driver with a DALI subsidiary circuit board for model SPxxxxDA-zz.

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: IEC 60598-2-2 for SP2002yy-zz series	—
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 ..... :	IEC 60598-2-2 for SP2002yy-zz series	P
22.4 (-)	Adjacent part fulfils relevant part of this part 2		N/A
22.4 (-)	Self-contained portable emergency luminaires, requirements according Annex E	(see Annex E)	N/A

22.5 (2)	**CLASSIFICATION OF LUMINAIRES**		**P**
22.5 (2.2)	Type of protection ..... :	Class II	P
22.5 (2.3)	Degree of protection..... :	IP20	—
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	User manual	P
	Language of instructions	English	P
22.6 (3.3.1)	Combination luminaires		N/A
22.6 (3.3.2)	Nominal frequency in Hz	50/60 Hz	P
22.6 (3.3.3)	Operating temperature		N/A
22.6 (3.3.5)	Wiring diagram		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

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Clause	Requirement + Test	Result - Remark	Verdict
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		N/A
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	Type Z for SP2002yy-zz series	P
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 light sources	P
22.6 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
22.6 (3.3.23)	Luminaire without controlgear provided with necessary information for selection of appropriate component		N/A
22.6 (3.3.24)	If not supplied with terminal block, information on the packaging		N/A
22.6 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P
22.6.1 (-)	Supply voltage	220-240 V	P
22.6.2 (-)	Classification according to annex B		P
22.6.3 (-)	Correct replacement lamp		N/A
22.6.4 (-)	Range of ambient temperatures		P
22.6.5 (-)	Fuse ratings and/or indicator lamps	Non-replaceable fuse and indicator lamp	N/A

IEC 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
22.6.6 (-)	Facilities to simulate normal supply failure		P
22.6.7 (-)	Marked with correct battery replacement		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	In the instruction manual	P
22.6.11 (-)	Details of test facilities		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		N/A
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	SP2001yy-zz and SP2003yy-zz: Permanent connection SP2002yy-zz: Supply cord with plug	P
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	Replaceable battery	P
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

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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		N/A
22.7 (4.7.2)	Test 8 mm live conductor		N/A
	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
	- 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

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Clause	Requirement + Test	Result - Remark	Verdict
22.7 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A
22.7 (4.8)	**Switches**		**N/A**
	- adequate rating		N/A
	- adequate fixing		N/A
	- polarized supply		N/A
	- compliance with IEC 61058-1 for electronic switches		N/A
22.7 (4.9)	**Insulating lining and sleeves**		**P**
22.7 (4.9.1)	Retainment		P
	Method of fixing ..... :	Heat-shrinkable tubing covered on external wire	P
22.7 (4.9.2)	Insulated linings and sleeves:		P
	Resistant to a temperature > 20 °C to the wire temperature or	52 °C + 20 °C = 72 °C (<125 °C)	P
	a) & c) Insulation resistance and electric strength		N/A
	b) Ageing test. Temperature (°C) ..... :		N/A
22.7 (4.10)	**Double or reinforced insulation**		**P**
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:		P
	- not coincidental		P
	- no straight access with test probe		P
22.7 (4.10.3)	Retainment of insulation:		P
	- fixed		P
	- 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

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Clause	Requirement + Test	Result - Remark	Verdict
	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		P
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
	Torque test: torque (Nm); part..... :	1.8 Nm; Screws for fixing input terminal block; dia. 4.4 mm	P
	Torque test: torque (Nm); part..... :	0.5 Nm; Screws for internal terminal block; dia. 3.0 mm	P
	Torque test: torque (Nm); part..... :	0.4 Nm; Screws for fixing enclosure of battery; dia. 2.8 mm	P
22.7 (4.12.2)	Screws with diameter < 3 mm screwed into metal		P
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

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Clause	Requirement + Test	Result - Remark	Verdict
	- fragile parts; energy (Nm) ..... :		N/A
	- other parts; energy (Nm)..... :	All external parts: 0.35	P
	1) live parts		P
	2) linings		P
	3) protection		P
	4) covers		P
22.7 (4.13.2)	Metal parts have adequate mechanical strength		N/A
22.7 (4.13.3)	Straight test finger		N/A
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
	A) four times the weight	For model SP2003DA-WH: 4 × Max. 1.15 kg = 4.6 kg For model SP2002DA-WH: 4 × Max. 0.9 kg = 3.6 kg	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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**		**P**
	- glow-wire test 650 °C ..... :	See Test Table 22.16 (13.3.2)	P
	- spacing ≥30 mm		N/A
	- screen withstanding test of 13.3.1		N/A
	- screen dimensions		N/A
	- no fiercely burning material		P
	- thermal protection		N/A
	- electronic circuits exempted		N/A
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**		**P**
	No lamp control gear..... :	Electronic lamp controlgear (compliance with Section 12)	P
	Provided with adaptor for a track meet the requirements for direct mounting on normally flammable surfaces		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

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Clause	Requirement + Test	Result - Remark	Verdict

	- 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
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

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	Minimum two fixing means		N/A
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		N/A
22.7 (4.31.1)	SELV circuits		P
	Used SELV source		P
	Voltage ≤ ELV		P
	Insulating of SELV circuits from LV supply		P
	Insulating of SELV circuits from other non SELV circuits		N/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		P
	Socket outlets does not admit plugs of other voltage systems		P
	Plugs and socket-outlets does not have protective conductor contact		P
22.7 (4.31.2)	FELV circuits		P
	Used FELV source	DALI circuit for SPxxxxDA-zz series	P
	Voltage ≤ ELV		P
	Insulating of FELV circuits from LV supply		P
	FELV 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
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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
	- 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
24.7 (-)	Luminaire with automatic testing system complies with IEC 62034 as identified in Annex K of IEC 61347-2-7		P
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 and additional safety requirements for electronic controlgear for emergency lighting in appropriate annex of standards	Emergency LED driver: IEC 61347-2-7	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.)	Reinforced insulation fulfilled	P
22.7.6 (-)	Circuit separation (centrally supplied lum.)		N/A
22.7.7 (-)	Charging device		P
	Indicator lamp and colour		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
22.7.11 (-)	Failure of lamp(s) not impair operation of the battery		P

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Clause	Requirement + Test	Result - Remark	Verdict
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
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		P
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 $f_{U_{OUT}}$ 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

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

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

22.11 (5)	**EXTERNAL AND INTERNAL WIRING**	**P**
22.11 (5.2)	**Supply connection and external wiring**	**P**

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Clause	Requirement + Test	Result - Remark	Verdict
22.11 (5.2.1)	Means of connection ..... :	Terminals for SP2001yy-zz and SP2003yy-zz Supply cord with plug for SP2002yy-zz	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 ..... :	H05VV-F (For SP2002yy-zz)	P
	Nominal cross-sectional area (mm²) ..... :	2 x 0.75 mm^2	P
	Cables equal to IEC 60227 or IEC 60245	IEC 60227	P
22.11 (5.2.3)	Type of attachment, X, Y or Z	Type Z	P
22.11 (5.2.5)	Type Z not connected to screws		P
22.11 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
22.11 (5.2.7)	Cable entries through rigid material have rounded edges		P
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:		P
	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		P
	- no tying of cables into knots etc.		P
	- insulating material or lining		P
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

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Clause	Requirement + Test	Result - Remark	Verdict
	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	Type Z	P
22.11 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N) ..... :	60 N	P
	- torque test: torque (Nm)..... :	0.25 Nm	P
	- displacement ≤ 2 mm	1.6 mm (For SP2002yy-zz)	P
	- no movement of conductors		P
	- no damage of cable or cord		P
	- function independent of electrical connection		P
22.11 (5.2.11)	External wiring passing into luminaire		P
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
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**

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Clause	Requirement + Test	Result - Remark	Verdict
22.11 (5.3.1)	Internal wiring of suitable size and type	See Annex 1	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)	0.5	P
	Insulation thickness (mm)	0.7	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		N/A
	Adequate cross-sectional area and insulation thickness		N/A
	Current limit rating according proven characteristics		N/A
22.11 (5.3.1.3)	Double or reinforced insulation for class II		N/A
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
22.11 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N/A
	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

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Clause	Requirement + Test	Result - Remark	Verdict
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		N/A
	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		P
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
	Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires		P
	Lamp holder 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		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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
22.12 (8.2.4)	Portable luminaire has 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	0 V after 1 min	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 ..... :	Recessed in testing box, As normal use	—
	b) test temperature (°C) ..... :	50	—

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Clause	Requirement + Test	Result - Remark	Verdict
	c) total duration (h) ..... :	390	—
	d) supply voltage (V) ..... :	Charging mode (normal lighting): 240 V; discharging mode (emergency lighting): Batteries supplied	—
	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
22.13 (12.4)	**Thermal test (normal operation)**	(see Annex 2)	**P**
22.13 (12.5)	**Thermal test (abnormal operation)**	(see Annex 2)	**P**
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**

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Clause	Requirement + Test	Result - Remark	Verdict
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
	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 Test 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 Test 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 ..... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
	- highest measured temperature of fixing point/ exposed part (°C): ..... :		—
	Ball-pressure test: ..... :	See Test Table 22.16 (13.2.1)	N/A
24.13.1 (-)	Endurance test for self-contained luminaire		P
	Operate satisfactory during 50 supply switching		P
24.13.2 (-)	Thermal test 12.4 to 12.5 in IEC 60598-1	(see Annex 2)	P
24.13.3 (-)	Condition of tests		—
22.13.4 (-)	Battery discharge		—
22.13.5 (-)	Reduced temperature		—
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 used according to user manual	—
	- 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	93 % R.H.; 25 °C	P

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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 ..... :		—
	Insulation resistance (MΩ) ..... :		—
	SELV		P
	- between current-carrying parts of different polarity :		N/A
	- between current-carrying parts and mounting surface..... :	>100 MΩ (> 1 MΩ) (for LED module part)	P
	- between current-carrying parts and metal parts of the luminaire..... :	>100 MΩ (> 1 MΩ) (for LED module part)	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 (> 2 MΩ)	P
	- between live parts and mounting surface ..... :	> 100 MΩ (> 4 MΩ)	P
	- between live parts and metal parts ..... :	> 100 MΩ (> 4 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)..... :		N/A
	SELV		P
	- between current-carrying parts of different polarity :		N/A
	- between current-carrying parts and mounting surface..... :	500 V (for LED module part)	P
	- between current-carrying parts and metal parts of the luminaire..... :	500 V (for LED module part)	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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 ..... :	1480 V	P
	- between live parts and mounting surface ..... :	2960 V	P
	- between live parts and metal parts ..... :	2960 V	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 (10.3)	Touch current or protective conductor current (mA).:	Touch current: SP2001DA-WH: 0.0268 mA SP2002DA-WH: 0.0284 mA SP2003DA-WH: 0.0272 mA (limit < 0.7 mA)	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 ..... :		P

22.17 (-)	**PHOTOMETRIC DATA**		**P**
22.17.1 (-)	Intensity distribution data provided		N/A
22.17.2 (-)	If declared values in cd/1 000 lm, reference flux in emergency mode provided		N/A
22.17.3 (-)	At least 50% of level declared photometric data 5 s after failure of supply		N/A
	100% of level declared photometric data		N/A
	- after 60 s		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- after 0,5 s after failure of supply if high-risk task-area lighting		N/A
	Photometric measurements according CIE 121 SP1		N/A
	LED luminaires measurements according CIE S025		N/A
	All values at least minimum declared data		N/A
22.17.4 (-)	Colour-rendering index	67.2 (required: Ra > 40)	P
22.17.5 (-)	Internally illuminated emergency safety sign meets 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	155 V (limit: 144 V-187 V)	P
22.19 (-)	**HIGH TEMPERATURE OPERATION**		**P**
	Operation at 70°C		P
	Relative light outputs	SP2001DA-WH: At ta 40 °C, after 60 s: 22.15 lx At 70 °C, 60 s: 20.82 lx; half of the rated duration: 20.87 lx Result: 94.0% (> 50 %) SP2003DA-WH: At ta 40 °C, after 60 s: 11.51 lx At 70 °C, 60 s: 11.12 lx; half of the rated duration: 11.32 lx Result: 96.6% (> 50 %) SP2002DA-WH: At ta 40 °C, after 60 s: 75.13 lx At 70 °C, 60 s: 69.66 lx; half of the rated duration: 71.23 lx Result: 92.7% (> 50 %)	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

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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	11.1.B	3.0	2.5	11.1.A	
Working voltage (V) .....:					240			—
PTI .....:					< 600 ☒ ≥ 600 ☐			—
Pulse voltage or U_P if applicable (kV) .....:					—			—
Supplementary information: Between L and N of input terminal block								
Distance 2:	R	5.5	3.0	11.1.B	5.5	5.0	11.1.A	
Working voltage (V) .....:					240			—
PTI .....:					< 600 ☒ ≥ 600 ☐			—
Pulse voltage or U_P if applicable (kV) .....:					—			—
Supplementary information: Between live part and enclosure								
Distance 3:	B	/	/	11.1.B	/	/	11.1.A	
Working voltage (V) .....:					8.19 Vd.c.			—
PTI .....:					< 600 ☒ ≥ 600 ☐			—
Pulse voltage or U_P if applicable (kV) .....:					—			—
Supplementary information: Working voltage is 8.19 V d.c. between LED module and enclosure. No values are specified for working voltage below 60 Vd.c as the test voltage of IEC 60598-1 Table 10.2 is considered sufficient.								

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

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Clause	Requirement + Test	Result - Remark	Verdict

22.8 (11.2)	TABLE II: Creepage distances and clearances							N/A
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**	
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:								
Distance 2:								
Working voltage (V) .....:								—
Frequency if applicable (kHz) .....:								—
PTI .....:					< 600 ☐	≥ 600 ☐		—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) .....:								—
Supplementary information:								
Distance 3:								
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.

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Clause	Requirement + Test	Result - Remark	Verdict

22.16 (13.2.1)	TABLE: Ball Pressure Test of Thermoplastics		P
Allowed impression diameter (mm) ..... :		2	—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)
Enclosure	See Annex 1	75	0.9
DC connector (connected battery)	See Annex 1	125	1.6
DC connector (connected LED module)	See Annex 1	125	1.8
PCB of LED module	See Annex 1	125	0.5
AC connector	See Annex 1	125	0.5
Supplementary information: None			

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
Enclosure	See Annex 1	10	No	0	P
DC connector (connected battery)	See Annex 1	10	No	0	P
DC connector (connected LED module)	See Annex 1	10	No	0	P
PCB of LED module	See Annex 1	10	No	0	P
Test switch	See Annex 1	10	No	0	P
Terminal block	See Annex 1	10	No	0	P
AC connector	See Annex 1	10	No	0	P
Supplementary information: None					

22.16 (13.3.2)	TABLE: Glow-wire test (IEC 60695-2-11)			P
Glow wire temperature ..... :		650 °C / 850 °C		—
Object/ Part No./ Material	Manufacturer/ trademark	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Connector of battery (850 °C)	See Annex 1	No	0	P
Enclosure of battery (850 °C)	See Annex 1	No	0	P

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Clause	Requirement + Test	Result - Remark	Verdict

Insulation sheet wrapped battery (850 °C)	See Annex 1	No	0	P
Input wire of battery (850 °C)	See Annex 1	No	0	P
LED cover (650 °C)	See Annex 1	No	0	P
Enclosure of lamp (650 °C)	See Annex 1	No	0	P
Supplementary information: None				

22.16 (13.4)	**TABLE: Proof tracking test (IEC 60112)**				**P**
Test voltage PTI ..... :		175 V			—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
PCB of LED module	See Annex 1	Specimen 1	Specimen 2	Specimen 3	P
Connector of battery	See Annex 1	Specimen 1	Specimen 2	Specimen 3	P
Connector of LED module	See Annex 1	Specimen 1	Specimen 2	Specimen 3	P
Supplementary information: According to below test condition to Verdict: A failure has occurred if a current of 0,5 A or more flows for at least 2 s by a conducting path between the electrodes on the surface of the specimen.					

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Clause	Requirement + Test	Result - Remark	Verdict

	Annex A: Batteries for self-contained emergency luminaires					**P**
A.1	Type of batteries	LiFePO4				P
A.2	Battery conform to relevant standard					P
	Luminaire operate within specific tolerances					P
A.3	Battery capacity	3.2 V 1500 mAh				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 C_{20}					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					P
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

	Annex B: Luminaire classification					**P**
	Classified and marked according Annex B.....:	X	1	AG	180	P

	Annex C: Luminance measurements					**P**
C.1	Contrast measurements					P
C.2	On site photometric tests					P
	according to Annex C of ISO 3864-4					P

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Clause	Requirement + Test	Result - Remark	Verdict
	Measured values not less than specified in this standard		P

	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
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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
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

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Clause	Requirement + Test	Result - Remark	Verdict

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		—

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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)]
Mains plug (Only for SP2002yy-zz series)	A	Da Zheng Wire & Cable MFG Ltd.	DZP-33	250 V, 10 A	AS/NZS 3112	NSW25490
Supply cord (Only for SP2002yy-zz series)	B	Da Zheng Wire & Cable MFG Ltd.	H05VV-F 2X(0.75 - 1.0 sq mm)	2 x 0.75 mm^2	AS/NZS 60227.5	NSW25492
Terminal block	B	Heavy Power Co., Ltd.	PA 16	AC 500 V, 76 A, 110 °C	EN 60998-1 EN 60998-2-1	VDE 40015628
AC connector	B	Foshan Shunde Jinjin Electrical Co., Ltd.	KZ8-230	450 V, 17.5 A, 0.75-1.5 mm^2, T85 or T110	EN 60998-1 EN 60998-2-1	VDE 40018824
Internal wire (connected input terminal block and AC connector, connected AC connector and emergency controlgear)	C	Foshan Shunde Juli Electrical Appliance Co., Ltd.	1015	20 AWG, 105 °C, 600 V	IEC 60598-1 IEC 60598-2-22	Tested in the EUT *UL E307403
Input wire of LED module	C	Foshan Shunde Juli Electrical Appliance Co., Ltd.	1007	80 °C, 300 V, 22 AWG	IEC 60598-1 IEC 60598-2-22	Tested in the EUT *UL E307403
DC connector on LED PCB	C	Zhejiang Hongxing Electrical Co., Ltd.	HX42002	300 V, 9 A	IEC 60598-1 IEC 60598-2-22	Tested in the EUT
PCB of LED module	C	Jiangmen Riff Electron Co., Ltd.	RF-20	V-0, 130 °C	IEC 60598-1 IEC 60598-2-22	Tested in the EUT *UL E323203
LED	C	Bridgelux, Inc.	BXEW-27E-11L-3A	SMD 4014, 3 V, 0.2 W	IEC 60598-1 IEC 60598-2-22	Tested in the EUT LM-80 test report: STD180704 NB-B
Output wire of battery	C	Guang Dong Xin Long Enterprise Co	1015	105 °C, 600 V, 22 AWG	IEC 60598-1 IEC 60598-2-22	Tested in the EUT *UL E207567

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Clause	Requirement + Test	Result - Remark	Verdict

Object / part No.	Code	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity[1)]
Battery	B	Shandong Goldencell Electronics Technology Co., Ltd.	HTCFR18650-1500mAh-3.2V	3.2 V, 4.8 Wh, 1500 mAh	IEC 62133-2	SGS CB FI-39160/A1
DC connector of battery	C	Zhejiang Hongxing Electrical Co., Ltd.	HX42003	300 V, 9 A	IEC 61347-1 IEC 61347-2-7	Tested in the EUT
Plastic material of test switch	C	Zhongshan Napu Engineering Plastic Co., Ltd.	PC/ABS-FR	PC, V-0, Thickness: 1.6 mm	IEC 60598-1 IEC 60598-2-22	Tested in the EUT *UL E238086
Enclosure of lamp and lamp cover	C	Zhongshan Napu Engineering Plastic Co., Ltd.	ABS-FR	ABS, V-0, Thickness: 1.6 mm	IEC 60598-1 IEC 60598-2-22	Tested in the EUT *UL E238086
Components of emergency controlgear						
PCB	C	Jiangmen Riff Electron Co., Ltd.	RF-20	V-0, 130 °C	IEC 61347-1 IEC 61347-2-7	Tested in the EUT *UL E323203
Screwless terminal block	A	Dongguan Changhe Electronics Co., Ltd.	CS200-00-350	250 V, 3.5 A, T110	EN 60998-1 EN 60998-2-2	VDE 40022503
Fuse (F1)	A	Littelfuse Inc.	392	250 V, 800 mA	IEC 60127-1 IEC 60127-3	VDE 126983
Varistor (RV1)	B	Cerglass MFG Inc	07D471K	300 V, 125 °C	IEC 61051-2 IEC 61051-2-2 IEC 61051-1	VDE 40028836
X capacitance (C1)	B	Foshan Shunde Chuang Ge Electronic Industrial Co., Ltd.	MKP-X2	275 VAC, 0.1 µF, 105 °C	IEC 60384-14	VDE 40008922
Y1 capacitance (C6)	B	Dongguan Jyhwei Electronics Co., Ltd.	JN	400 V AC, 2200 pF, 125 °C	IEC 60384-14	VDE 40047520
Opto-coupler (IC2)	B	Everlight Electronics Co., Ltd.	EL817	External CR/CL: 7.6 mm, DTI ≥ 0.4 mm, 110 °C	EN 60747-5-5 EN 62368-1	VDE 132249
Opto-coupler on subsidiary circuit board	B	Everlight Electronics Co., Ltd.	EL357N	External CR/CL: 5.0 mm, DTI ≥ 0.4 mm, 110 °C	EN 60747-5-5 EN 62368-1	VDE 132249

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Clause	Requirement + Test	Result - Remark	Verdict

Object / part No.	Code	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity[1)]
Transformer (TR1)	C	REMOVED	EE19	Class B	IEC 61347-1 IEC 61347-2-7	Tested in the EUT
Multi-layer insulation wire	B	Dongguan Hilde Electronics Co., Ltd.	THW-B	130 °C	IEC 62368-1	VDE 40047386
Magnet Wire	B	Dongguan Yida Industrial Co., Ltd.	xUEW/130, QA-x/130	130 °C	IEC 61347-1 IEC 61347-2-7	Tested in the EUT *UL E344055
Bobbin	B	Chang Chun Plastics Co., Ltd.	T375HF	V-0, 150 °C	IEC 61347-1 IEC 61347-2-7	Tested in the EUT *UL E59481
Insulating Tape	C	Shenzhen Xinhuahui Adhesive Technology Co., Ltd.	HMT803, HMT	130 °C	IEC 61347-1 IEC 61347-2-7	Tested in the EUT *UL E328315
Teflon tubing	C	Shenzhen Fushunchang Electronic Co., Ltd.	FSC-T	300 V, 200 °C	IEC 61347-1 IEC 61347-2-7	Tested in the EUT *UL E521597
Heat-shrinkable tubing (covered on input wire of LED module)	C	Guangzhou Kaiheng New Material Co., Ltd.	K-102 (CB)	300 V, 125 °C	IEC 61347-1 IEC 61347-2-7	Tested in the EUT *UL E321827

Supplementary information:

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

*Component has been certified by UL according to UL standards. Compliance with the requirements of the product standard(s) (see page one of this test report) has been checked.

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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	TABLE: Thermal tests of Section 12		P
	Type reference ..... :	SP2001DA-WH	—
	Lamp used..... :	Enclosed LEDs	—
	Lamp control gear used..... :	Integral electronic control gear	—
	Mounting position of luminaire..... :	Fixed mounting and normal use	—
	Supply wattage (W) ..... :	Test 2 (a): normal lighting and charging empty battery; 4.0 Test 2 (b): discharge with full battery	—
	Supply current (A)..... :	Test 2 (a): 0.044 Test 2 (b): 0.2	—
	Temperatures in test 1 - 4 below are corrected for ta (°C) ..... :	40	—
	- abnormal operating mode ..... :	Replacement of batteries with a short-circuit link across the battery charger output	—
22.13 (12.4)	- test 1: rated voltage ..... :	—	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current ..... :	1.06 x 240 V = 254.4 V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :	—	—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :	—	—
22.13 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current ..... :	1.1 x 240 V = 264 V	—

Temperature measurements (°C)								
Part	Ambient	Cl. 12.4 – normal					Cl. 12.5 – abnormal	
		test 1	test 2 (a) (Charging mode)	Test 2 (b) (Emergency mode)	test 3	limit	test 4	limit
Fixing wire	—	—	48	41	—	90	48	—
Input terminal block	—	—	49	41	—	110	47	—
Internal wire (connected terminal block)	—	—	44	41	—	105	46	—
AC connector	—	—	46	41	—	85	47	—
Input wire of driver	—	—	45	41	—	105	46	—
Internal wire (connected LED module)	—	—	51	46	—	80	51	—

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Clause	Requirement + Test	Result - Remark	Verdict

Temperature measurements (°C)								
Part	Ambient	Cl. 12.4 – normal					Cl. 12.5 – abnormal	
		test 1	test 2 (a) (Charging mode)	Test 2 (b) (Emergency mode)	test 3	limit	test 4	limit
DC connector on PCB of LED module	—	—	43	42	—	Ref.	43	90
PCB of LED module	—	—	45	42	—	130	45	—
Internal wire (connected battery)	—	—	51	46	—	105	51	130
battery	—	—	43	43	—	45	43	—
Test switch	—	—	40	41	—	55	41	105
Enclosure of lamp	—	—	43	41	—	Ref.	43	—
LED cover	—	—	41	41	—	Ref.	41	—
Mounting surface of lamp	—	—	47	41	—	90	47	—
Ambient	—	—	40	40	—	—	40	—
Components of integral controlgear								
Input terminal block	—	—	49	41	—	110	49	—
Varistor (RV1)	—	—	58	42	—	125	59	—
X capacitor (C1)	—	—	56	41	—	105	57	115
L4 winding	—	—	57	41	—	110*	58	165*
Electrolytic capacitor (C2)	—	—	74	42	—	105	74	115
Electrolytic capacitor (C4)	—	—	68	42	—	105	71	115
TR1 winding	—	—	69	41	—	110*	66	165*
TR1 bobbin	—	—	69	42	—	Ref.	64	165*
TR1 core	—	—	70	42	—	110*	69	165*
PCB near TR1	—	—	68	43	—	130	65	—
Optocoupler (IC2)	—	—	67	43	—	110	66	—
CY1	—	—	65	42	—	125	65	135
Optocoupler 1 on subsidiary circuit board	—	—	59	43	—	110	58	—
Optocoupler 2 on subsidiary circuit board	—	—	58	43	—	110	57	—
Electrolytic capacitor (C7)	—	—	65	43	—	105	62	115
Electrolytic capacitor (C8)	—	—	62	44	—	105	60	115
Electrolytic capacitor (C13)	—	—	65	44	—	105	59	115

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Clause	Requirement + Test	Result - Remark	Verdict

Temperature measurements (°C)								
Part	Ambient	Cl. 12.4 – normal					Cl. 12.5 – abnormal	
		test 1	test 2 (a) (Charging mode)	Test 2 (b) (Emergency mode)	test 3	limit	test 4	limit
Electrolytic capacitor (C12)	—	—	58	44	—	105	54	115
Electrolytic capacitor (C15)	—	—	54	50	—	105	53	115
Electrolytic capacitor (C18)	—	—	55	50	—	105	56	115
DC connector (connected LED module)	—	—	45	41	—	Ref.	45	—
DC connector (connected battery)	—	—	51	47	—	Ref.	51	—
Supplementary information: *) Temperature limits of winding include less 10 °C for thermocouple measurement method.								

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

ANNEX 2	TABLE: Thermal tests of Section 12		P
	Type reference ..... :	SP2002DA-WH	—
	Lamp used..... :	Enclosed LEDs	—
	Lamp control gear used..... :	Integral electronic control gear	—
	Mounting position of luminaire..... :	Recessed in testing box covering with thermal insulating material and normal use	—
	Supply wattage (W) ..... :	Test 2 (a): normal lighting and charging empty battery; 3.94 Test 2 (b): discharge with full battery	—
	Supply current (A)..... :	Test 2 (a): 0.044 Test 2 (b): 0.2	—
	Temperatures in test 1 - 4 below are corrected for ta (°C) ..... :	40	—
	- abnormal operating mode ..... :	Replacement of batteries with a short-circuit link across the battery charger output	—
22.13 (12.4)	- test 1: rated voltage ..... :	—	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current ..... :	1.06 x 240 V = 254.4 V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :	—	—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :	—	—
22.13 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current ..... :	1.1 x 240 V = 264 V	—

Temperature measurements (°C)								
Part	Ambient	Cl. 12.4 – normal					Cl. 12.5 – abnormal	
		test 1	test 2 (a) (Charging mode)	Test 2 (b) (Emergency mode)	test 3	limit	test 4	limit
Mains plug	—	—	41	40	—	70	41	75
Supply cord	—	—	46	41	—	90	46	90
Internal wire (connected LED module)	—	—	52	43	—	80	51	—
DC connector on PCB of LED module	—	—	44	42	—	Ref.	44	—
PCB of LED module	—	—	42	41	—	130	42	—

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Clause	Requirement + Test	Result - Remark	Verdict

Temperature measurements (°C)

Part	Ambient	Cl. 12.4 – normal					Cl. 12.5 – abnormal	
		test 1	test 2 (a) (Charging mode)	Test 2 (b) (Emergency mode)	test 3	limit	test 4	limit
Internal wire (connected battery)	—	—	49	46	—	105	48	—
battery	—	—	45	44	—	45	45	—
Internal wire (connected test switch)	—	—	43	42	—	105	43	—
Test switch	—	—	41	41	—	55	41	55
Enclosure of lamp	—	—	41	41	—	Ref.	41	—
Inner Enclosure of lamp	—	—	51	42	—	Ref.	50	—
LED cover	—	—	41	41	—	Ref.	41	130
Mounting surface of lamp	—	—	43	41	—	90	42	—
Test box (side)	—	—	42	42	—	90	—	130
Test box (top)	—	—	41	41	—	90	—	130
Ambient	—	—	40	40	—	—	40	—
Components of integral controlgear								
Input terminal block	—	—	48	41	—	110	47	—
Varistor (RV1)	—	—	57	42	—	125	58	—
X capacitor (C1)	—	—	56	42	—	105	57	115
L4 winding	—	—	58	42	—	110*	57	165*
Electrolytic capacitor (C2)	—	—	65	42	—	105	65	115
Electrolytic capacitor (C4)	—	—	67	42	—	105	68	115
TR1 winding	—	—	68	43	—	110*	65	165*
TR1 bobbin	—	—	68	43	—	110*	65	165*
TR1 core	—	—	67	43	—	110*	64	165*
PCB near TR1	—	—	65	44	—	130	62	—
Optocoupler (IC2)	—	—	63	43	—	110	62	—
CY1	—	—	59	42	—	125	57	135
Optocoupler 1 on subsidiary circuit board	—	—	57	43	—	110	56	—
Optocoupler 2 on subsidiary circuit board	—	—	57	43	—	110	57	—
Electrolytic capacitor (C7)	—	—	62	44	—	105	59	115
Electrolytic capacitor (C8)	—	—	65	44	—	105	62	115

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Clause	Requirement + Test	Result - Remark	Verdict

Temperature measurements (°C)								
Part	Ambient	Cl. 12.4 – normal					Cl. 12.5 – abnormal	
		test 1	test 2 (a) (Charging mode)	Test 2 (b) (Emergency mode)	test 3	limit	test 4	limit
Electrolytic capacitor (C13)	—	—	61	44	—	105	57	115
Electrolytic capacitor (C12)	—	—	60	45	—	105	56	115
Electrolytic capacitor (C15)	—	—	57	50	—	105	55	115
Electrolytic capacitor (C18)	—	—	52	51	—	105	51	115
DC connector (connected LED module)	—	—	52	47	—	Ref.	52	—
DC connector (connected battery)	—	—	54	51	—	Ref.	53	—
DC connector (connected test switch)	—	—	51	47	—	Ref.	51	—
Supplementary information: *) Temperature limits of winding include less 10 °C for thermocouple measurement method.								

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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
(15.6.1)	Conductors		N/A
	Terminal size and rating		N/A
15.6.2	Mechanical tests		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

(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)										
Supplementary information:										

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

	Attachment 1: European Group Difference and National Differences	**P**

ATTACHMENT TO TEST REPORT
IEC 60598-2-22
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES
LUMINAIRES
PART 2: PARTICULAR REQUIREMENTS
SECTION 22: LUMINAIRES FOR EMERGENCY LIGHTING

Differences according to..... :	EN 60598-2-22:2014 + A1:2020 used in conjunction with EN 60598-1:2015 + A1:2018
TRF template used..... :	IECEE OD-2020-F2:2020, Ed. 1.1
Attachment Form No. ..... :	EU_GD_IEC60598_2_22G_II
Attachment Originator..... :	IMQ S.p.A.
Master Attachment..... :	2020-09-01

	CENELEC COMMON MODIFICATIONS (EN)		**P**
22.6 (3)	**MARKING**		**P**
22.6 (3.3.101)	For luminaires not supplied with terminal block: Adequate warning on the package		N/A
22.7 (4)	**CONSTRUCTION**		**P**
22.7 (4.11.6)	Electro-mechanical contact systems. Electric strength test according 10.2 with reduced to 1500 V test voltage.		N/A
22.11 (5)	**EXTERNAL AND INTERNAL WIRING**		**P**
22.11 (5.2.1)	Connecting leads		N/A
	- without a means for connection to the supply		N/A
	- terminal block specified		N/A
	- relevant information provided		N/A
	- compliance with 4.6, 4.7.1, 4.7.2, 4.10.1, 11.2, 12 and 13.2 of Part 1		N/A
22.11 (5.2.2)	Cables equal to EN 50525		P
	Replace table 5.1 – Supply cord		P
22.13 (12)	**ENDURANCE TESTS AND THERMAL TESTS**		**P**
22.13 (12.4.2c)	Thermal test (normal operation) see footnote c table 12.2 relating to fixed wiring without sleeve		N/A
ZB	**ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)**		**P**

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

(3.3)	DK: power supply cords of class I luminaires with label		N/A
(4.5.1)	DK: socket-outlets		N/A
(5.2.1)	CY, DK, FI, GB: type of plug		N/A
ZC	**ANNEX ZC, NATIONAL DEVIATIONS (EN)**		**P**
(4 & 5)	FR: Shuttered socket-outlets 10/16A		N/A
	FR: Safety requirements for high buildings *(Decree of 30 December 2011 on safety regulations for the construction of high-rise buildings and their protection against fire and panic risks; Section VIII; Article GH 48, Lighting)* Glow-wire test for outer parts of luminaires:		N/A
	- 850 °C for luminaires in stairways and horizontal travel paths		N/A
	- 650 °C for indoor luminaires		N/A
	GB: Requirements according to United Kingdom Building Regulation		N/A

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

	Attachment 2: National Differences for Australia according to AS/NZS 60598.1:2017+A1:2017+A2:2020 and AS 60598.2.22:2019	**P**

	AS/NZS 60598.1:2017+A1:2017+A2:2020		**P**
AMDT NO.2 NOV 2020	**Preface**		**P**
1	Delete the second paragraph and replace with the following: This Standard incorporates Amendment No. 1 (November 2017). The changes required by Amendment No. I are indicated in the text by marginal bar and amendment number against the clause, note, table, figure or part thereof affected. Amendment No. 2 (November 2020) is attached at the end of the document.		P
2	After the objective statement (third paragraph in current version） αdd the following: The objective of Amendment 2 is to— (aa) add a requirement for a cord tag for luminaires intended to be fixed to the wall and supplied with a plug and cord; (bb) amend requirements for small batteries in Clause 4.101; (cc) modify references to metal oxide varistors; and (dd) correct needle-flame test requirements in Clause 13.3.3. AS/NZS 60598.1:2017 incorporating Amendment No. 1:2017 will remain current for 12 months from the date of publication of Amendment No. 2. After this time, it will be superseded by AS/NZS 60598.1 :2017 incorporating Amendment No. 1 :2017 and Amendment No. 2:2020. Regulatory authorities that reference this Standard in regulation may apply these requirements at a different time. Users of this Standard should consult with these authorities to confirm their requirements.		P
0	**GENERAL INTRODUCTION**		**P**
0.4.2	In Australia, for equipment, other than class III equipment, that is intended for connection to the supply mains and shall mark 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 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 240 V for single-phase equipment and 415 V for three-phase equipment.	220-240 V including 240 V	P
0.5	Insert the following text as the first paragraph: Throughout this document, where there is a relevant Australian/New Zealand Standard, it replaces the IEC Standard unless otherwise specified.		P

IEC 60598-2-22_ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
0.5.101 (new)	Capacitors shall be of a type to ensure that any capacitor failure results in a failsafe outcome (i.e. the capacitor type will fail in the open-circuit mode only and is protected against fire or shock hazard).	Capacitor fulfil EN 60384-14	P
0.5.102 (new)	Control gear Power supplies shall comply with the relevant part 2 of the AS/NZS 61558 series. Control gear shall comply with the relevant part 2 of the AS/NZS 61347 series. Battery chargers used for lighting other than emergency lighting shall comply with AS/NZS 60335.2.29.		P
1	**DEFINITIONS**		--
1.2.101 (new)	The following definitions were added: 1.2.101 installation coupler 1.2.103 installation male connector 1.2.104 installation female connector 1.2.105 installation coupler system		--
2.2	Class 0 luminaires are not allowed in Australia or New Zealand.		P
3	**MARKING**		**P**
3.1	After the first paragraph, insert the following text: In Australia and New Zealand, instructions and other texts required by this Standard shall at least be written in English.		P
3.2.3	Delete the text ‘, if other than 25 °C’.		P
3.2.12	In Australia, luminaires for household use having supply cords which are not fitted with a plug shall be marked with a cord tag with the symbol for “must be installed by a licensed electrician”		N/A
3.2.23	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 the following 3.3.7 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’.		P

IEC 60598-2-22_ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
AMDT NO.2 NOV 2020	**Appendix ZZ variation to Clause 3.3.19 (new)** Add the following after the variation to Clause 3 .3 .18:		N/A
3.3.19	Delete the text and replace with the following Note: NOTE In Australia and New Zealand, there is no allowance for a protective conductor current greater than 10 mA.		N/A
3.3.21	Delete the text 'Caution, risk of electric shock' and the symbol.		N/A
3.3.101 and 3.3.102 (new)	After Clause 3.3.22, add new Clauses 3.3.101 and 3.3.102 as follows: 3.3.101 The instructions shall contain details of the components in the luminaire that require replacement as part of a maintenance program. 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
	– 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
AMDT NO.2 NOV 2020	Appendix ZZ addition of Clause 3.3.103 (new) Add the following after the variation listed as Clause 3 .3 .102:		P
3.3.103 (new)	After Clause 3.3.102，add new Clause 3 .3 .103, as follows: 3.3.103 Luminaires intended to be fixed to the wall and are supplied with a plug and a cord shall be 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.		P
4	**CONSTRUCTION**		**P**

IEC 60598-2-22_ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
4.7.2	Delete the first paragraph and replace with the following: 4.7.2 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 the replacement of replaceable light sources or starters.		P
4.8	1 After the third paragraph, insert the following text: 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. 2 Fourth paragraph, delete the text 'IEC 61058-1' and replace with 'AS/NZS 60669.2.1 or IEC 61058-1 classified for 10,000 operating cycles'.		N/A
4.10.4	First paragraph, 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.		P
4.14.6	After the first paragraph, insert the following text: A fixed socket-outlet complying with AS/NZS 3112 or AS/NZS 60884.1 is used for the following test.		N/A
4.32	At the end of the Clause, insert the following text: Metal oxide varistors shall comply with the requirements of AS/NZS 3100 for metal oxide varistors incorporated in accessories. NOTE The test and assessment is conducted on any circuits connected between phases (between actives and between actives and neutral) and circuits connected between phases and earth (actives-to-earth and neutral-to-earth).	300 Vac, 4800 Ohm, the circuit opened.	P
4.101 (new)	After Clause 4.32, add new Clauses as follows:		N/A
4.101.1	Small batteries		N/A
	Batteries that fit wholly within the small parts cylinder as specified in Clause 5.2 of ISO 8124-1 shall not be removable without the aid of a tool.		N/A
4.101.2	Battery compartment fasteners		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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.		N/A
AMDT NO.2 NOV 2020	**Appendix ZZ variation to Clause 4.32** Delete the text of the variation to Clause 4.32 and replace with the following: Delete the text and replace with the following:		N/A
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
	NOTE: Examples of SPCs are varistors (MOVs) and gas discharge tubes (GDTs). SPCs may be integrated with thermal protection devices, such as thermal fuses or PTCs, in the same package. SPDs will utilize SPCs and are a complete assembly		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
AMDT NO.2 NOV 2020	Appendix ZZ Clause 4.101 In Clause 4.101.1, delete first three paragraphs and replace with the following text: 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.		P
	NOTE: Batteries are specified in IEC 60086-2		P
AMDT NO.2 NOV 2020	Appendix ZZ variations to Clause 8.2.1		P
1	In the first item, third sentence, delete “Luminaires with non-replaceable light sources are subjected to the tests of Clause 4.29 prior to applying the tests and inspections of Section 8 of this Standard”		P

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Clause	Requirement + Test	Result - Remark	Verdict
2	Delete the text of the second item, and replace with the following: Delete the ninth paragraph beginning with 'Covers in fixed luminaires that cannot be removed ⋯' and replace with 'Covers that can be removed by hand shall be removed.'		P
5	**EXTERNAL AND INTERNAL WIRING**		**P**
5.2.1	Means of connection……:	terminal for SP2001yy-zz and SP2003yy-zz Supply cord with plug for SP2002yy-zz	P
	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.		P
	The plug portion of a luminaire with integral pins shall comply with the relevant requirements of AS/NZS 3112.		N/A
5.2.2	1 Delete the first paragraph and replace with the following: 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 in AS/NZS 3191, and shall be capable of withstanding, without deterioration, the highest temperature to which they may be exposed under normal conditions of use.		P
	2 Delete the fourth paragraph and replace with the following: To provide adequate mechanical strength, the nominal cross-sectional area of the conductors shall be not less than: — 0,75 mm^2; — 1,0 mm^2 for portable rough service luminaires.		P
5.2.16	At the end of the Clause, insert the following text: Class II luminaires for fixed wiring incorporating an appliance coupler shall not have means to allow further luminaires to be connected by cascading including connection by looping-in.		N/A
	Luminaire couplers incorporated with the luminaire comply with IEC 61995-1		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Luminaires incorporating installation couplers may have means to allow further luminaires to be connected by cascading provided the through wiring is rated for the current rating of the installation coupler.		N/A
5.2.18	Delete Clause and replace with the following: 5.2.18 All portable luminaires with a supply cord shall be fitted with a plug complying with AS/NZS 3112. Other luminaires with a supply cord shall be fitted with a plug complying with AS/NZS 3112, unless they have the warning specified by Clause 3.2.12.		P
5.3.1	Delete the third paragraph and replace with the following: Internal wires coloured green, yellow or green/yellow combination shall be used for making protective earth connections only. Functional earth connections shall not be made by wires coloured green, yellow or green/yellow combination.		N/A
5.3.1.3	Delete Clause and replace with the following: 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	Delete the third paragraph and replace with the following: All conductors, whether internal or external, coloured green, yellow or green/yellow combination, shall only be connected to an earthing terminal.		N/A
8	**PROTECTION AGAINST ELECTRIC SHOCK**		**P**
8.2.1	1 Delete the first two paragraphs including Note 1 and replace with the following: Luminaires shall be so constructed that their live parts and basic insulation are not accessible when the luminaire has been installed and wired as in normal use. Live parts shall not be accessible when the luminaire is opened as necessary for user cleaning or maintenance, or for replacement of lamps, replaceable light sources or (replaceable) starters, even if the operation cannot be achieved by hand. Luminaires with non-replaceable light sources are subjected to the tests of Clause 4.29		P
	2 Delete the ninth paragraph beginning with ‘Covers in fixed luminaires that cannot be removed…’		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

9	**RESISTANCE TO DUST AND MOISTURE**		**P**
9.2	After Note 1, insert the following new Note: NOTE 101 A designation of IPX7 or IPX8 is considered unsuitable for exposure to water jets (designated by IPX5 or IPX6) and may not comply with requirements for second numeral 5 or 6 unless it is dual coded.		N/A

AMDT NO.2 NOV 2020	**Appendix ZZ variations to Clause 10.2 (new)** Add the following after the variation to Clause 9.2:		P
10.2	1 Delete the fourth paragraph and replace with the following: 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:		P
	(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.		P
	2 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.		N/A

13	**RESISTANCE TO HEAT, FIRE AND TRACKING**		**P**
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

IEC 60598-2-22_ATTACHMENT			
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. 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. The test apparatus, test procedure and criteria shall be those specified in AS/NZS 60695.2.11. The glow wire is heated to 750 °C and applied to one test sample for 30 s.	PCB of LED module; Connector of LED module; Connector of Battery; Test switch, terminal block, AC connector	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. The test apparatus, test procedure and criteria shall be those specified in AS/NZS 60695.2.11. The glow wire is heated to 650 °C and applied to one test sample for 30 s.	Enclosure of lamp	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 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. Parts shielded by a barrier that meets the needle-flame test of AS/NZS 60695.11.5 are not tested.		N/A
2020	**Appendix ZZ variation to Clause 13.3.3** Add the following text to the end of fourth paragraph:		P
	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.		P

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

	AS 60598.2.22:2019		**--**
	APPENDIX ZZ **Variations to IEC 60598-2-22:2017(Ed. 4.1) for Australia**		**--**
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.		--
ZZ2	Variations The following modifications are required for Australian conditions:		--
Cl. 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.		--
Cl. 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 that are identical adoptions of international normative references may be used interchangeably.		--
Cl. 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:		--
Cl. 22.3.1	Delete “lighting and standby lighting”, and replace with “lighting, standby lighting and illuminated emergency exit signs”.		**--**
Cl. 22.3.1.101 (new)	After Clause 22.3.1, insert the following:		**--**
22.3.1.101	Illuminated emergency exit signage		**--**

IEC 60598-2-22_ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	Those parts of an emergency lighting scheme intended to communicate the path of travel to a required exit by displaying appropriate images.		--
Cl. 22.3.14	Deleted term and definition.		N/A
Cl. 22.3.15	Delete term and definition and replace with the following:		P
	Rated duration of emergency operation		P
	Minimum duration time of emergency mode as stated by the manufacturer		P
Cl. 22.3.18	After definition, add the following: Note 1 to entry: Rest and inhibition modes are not specified in AS/NZS 2293.3.		P
Cl. 22.4	Delete fifth paragraph		P
Cl. 22.5	1 delete second paragraph and replace with the following: Emergency luminaires may also be classified as specified in Annex B.		P
	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
Cl. 22.6.7	After the first paragraph, insert the following: Alternatively, the battery and luminaires 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.		P
Cl. 22.6.15	Delete clause.		P
Cl. 22.6.17	Delete text and replace with 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 22.6.2, 22.6.2, 22.6.5, 22.6.7 and 22.6.9 shall be visible during the maintenance of the relevant component.		P
Cl. 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
Cl. 22.6.101 (new)	After Clause 22.6.21, add the following:		P

IEC 60598-2-22_ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
Cl.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.	Described in instruction manual and luminaire.	P
	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
Cl. 22.7	Delete text and replace with the following		P
	The provisions of Section 4 of AS/NZS 60598.1 shall apply together with the requirements of Clause 22.7.2 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
Cl. 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
Cl. 22.7.8	Delete clause.		P
Cl. 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.		P
Cl. 22.7.12	Delete “NiMH” and insert “NiMH or Li alloy”		P
Cl. 22.7.21	Delete clause.		N/A
Cl. 22.7.22	Delete clause.		N/A
Cl. 22.7.101 (new)	After Clause 22.7.23 note, add the following:		P

IEC 60598-2-22_ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
Cl.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.	Performed by qualified personnel only.	P
Cl. 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 warning 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
Cl. 22.13.4	Delete text and replace with the following:		P
	For the purposes of Clause 22.13.3, additional minimum batter voltage limits apply. Voltage limits for discharge durations in Table 1 shall be used unless otherwise specified by the battery cell manufacturer.		P
Cl 22.13.5	Delete text and replace with the following:		P
	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 for NiCd, LiFePO4 and other battery technologies.		P
Cl. 22.13.7	Delete text and replace with 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 shall be allowed to cell to its rated ambient temperature(ta) or to 25°C, whichever is the higher. The self-contained emergency luminaire shall then be charged for 24h 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
Cl 22.13.101 (new)	After Clause 22.13.7, add the following:		P
22.13.101	Functional safety shall conform with the relevant requirements of AS/NZS 2293.3.		P

IEC 60598-2-22_ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
Cl. 22.14	Delete text and replace with the following: The provisions of Section 9 of AS/NZS 6058.1 shall apply. For luminaires with IP classification greater than IP20, the order of tests specified in Section 9 of AS/NZS60598.1 shall be as specified in Clause 22.13 of this Standard.		P
Cl. 22.16	1 second paragraph, delete “or the leads from the charger to the battery or charger circuit,”.		P
	2 delete third paragraph.		P
	3 delete fourth paragraph.		P
Cl. 22.17	Delete clause and replace with the following: 22.17 Photometric data Photometric data shall be provided and performed in accordance with Appendix of AS/NZS 2293.3.		P
Cl. 22.19	First paragraph, delete “at least half of the rated duration” and replace with “at least 30 minutes”.		P
Cl. 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/NZS2293.1 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:		P
	Appendix ZA **(normative)** **Batteries for emergency luminaires**		P
	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. 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.	Lithium battery conform to IEC 62133-2	P

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Clause	Requirement + Test	Result - Remark	Verdict

	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.					P
Annex B	Delete annex and replace with the following:					P
	Appendix ZB **(normative)** **Luminaire classification**					P
	Emergency luminaires should be classified and marked in accordance with their construction as follows.					P
	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.					P
	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.					P
	Classified and marked according Annex ZB	X	1	AG	180	P
Annex C	Delete annex and replace with following:					N/A
	Appendix ZC **(normative)** **Luminaire measurements**					N/A
	The luminance measurements of illuminated emergency exit signage shall conform with section 3 of AS/NZS 2293.3.					N/A
Bibliography	After first entry, add the following:					N/A
	AS/NZS2293.2, emergency escape lighting and exit signs for building, Part 1: System design, installation and operation					N/A

IEC 60598-2-22_ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	Attachment 3: Additional test according to IEC 60598-2-2(ed.3):2011 and EN 60598-2-2:2012		—
2.12 (8)	**PROTECTION AGAINST ELECTRIC SHOCK**		**P**
2.12 (-)	Parts within the celling space provide same degree of protection against electric shock as parts below the celling space		P
2.13 (12)	**ENDURANCE TEST AND THERMAL TEST**		**P**
2.13 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 2.14		—
2.13.1 (-)	Wiring, for connection to the supply, not reach unsafe temperature		P
	- measured temperature of the cable (°C) .....:	46 °C < 90 °C	P
2.14 (9)	**RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE**		**P**
2.14 (-)	If IP > IP 20 the order of the test specified in clause 2.13		—

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

	Attachment 4: National Differences for Australia according to AS/NZS 60598.2.2:2016	**P**

2.5	**Classification of luminaires**		**P**
2.5.101	General Luminaires shall be classified in accordance with the provisions of Section 2 of AS/NZS 60598.1, along with the following. Luminaires shall be classified according to their suitability for use near, or being covered with, building elements or thermal insulation, or both, in accordance with Clause 2.5.102 for Australia or Clause 2.5.103 for New Zealand. NOTE Appendix ZD provides information and guidance on the classifications, symbols, applications and general restrictions on recessed luminaires.		P
2.5.102	Australian classifications		P
	Luminaires shall be classified as one of the following:		P
	a) Non-IC b) Do-not-cover c) CA90 d) IC e) IC-4	IC	P
2.5.103	New Zealand classifications		P
	a) Non-IC b) Do-not-cover c) CA90 d) CA135 e) IC f) IC-4	IC	P
2.6	**Marking**		**P**
2.6.101	General The provisions of Clause 3 of AS/NZS 60598.1 apply, along with the following: - Clause 3.2.21 of AS/NZS 60598.1 is replaced by Clause 2.6.102. - The additional requirements of Clause 2.6.103 and Clause 2.6.104 apply, as applicable.		P
2.6.102	Luminaire symbol marking		P
	Non-IC luminaires		N/A
	Do-not-cover luminaires		N/A

IEC 60598-2-22_ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	CA90 luminaires		N/A
	CA135 luminaires, for New Zealand		N/A
	IC luminaires		P
	IC-4 luminaires		N/A
2.6.103	Location and durability of marking		P
	a) legible, durable and visible when the luminaire is installed and viewed from behind;		P
	b) a minimum size of 25 mm x 25 mm; and		P
	c) permanently marked on the luminaire or on a durable swing tag permanently connected to the luminaire.	Permanently marked on the luminaire	P
	The marking shall comply with the durability test requirements of AS/NZS 60598.1.		P
2.6.104	Additional information to be supplied with the luminaire		P
2.6.104.1	General		P
2.6.104.2	Additional warning		P
2.6.104.2.1	General Luminaires shall have additional warnings in accordance with 2.6.104.2.2 for Australia and 2.6.104.2.3 for New Zealand.		P
2.6.104.2.2	Australia additional warning Non-IC luminaires shall be supplied with installation instructions containing the following warning: WARNING — THIS LUMINAIRE IS NOT SUITABLE FOR INSTALLATION IN LOCATIONS WHERE THERMAL INSULATION IS PRESENT, OR MAY REASONABLY BE EXPECTED TO BE INSTALLED IN THE FUTURE, OR WHERE THERE IS A LIKELIHOOD OF OTHER COMBUSTIBLE MATERIAL, E.G. LEAVES OR VERMIN DEBRIS, ETC. COLLECTING ON OR AROUND THE LUMINAIRE. IT IS NOT SUITABLE FOR DOMESTIC INSTALLATIONS OR INSTALLATION IN RESIDENTIAL AREAS OF NON-DOMESTIC INSTALLATIONS (RESIDENTIAL INSTITUTIONS, HOTELS, BOARDING HOUSES, HOSPITALS, ACCOMMODATION HOUSES, MOTELS, HOSTELS AND THE LIKE).		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
2.6.204.2.3	New Zealand additional warning Non-IC luminaires and Do-Not-Cover luminaires shall be supplied with installation instructions containing the following warning: WARNING — THIS LUMINAIRE IS NOT SUITABLE FOR INSTALLATION IN LOCATIONS WHERE THERMAL INSULATION IS PRESENT, OR MAY REASONABLY BE EXPECTED TO BE INSTALLED IN THE FUTURE, OR WHERE THERE IS A LIKELIHOOD OF OTHER COMBUSTIBLE MATERIAL, E.G. LEAVES OR VERMIN DEBRIS, ETC. COLLECTING ON OR AROUND THE LUMINAIRE. IT IS NOT SUITABLE FOR DOMESTIC INSTALLATIONS OR INSTALLATION IN RESIDENTIAL AREAS OF NON-DOMESTIC INSTALLATIONS (RESIDENTIAL INSTITUTIONS, HOTELS, BOARDING HOUSES, HOSPITALS, ACCOMMODATION HOUSES, MOTELS, HOSTELS AND THE LIKE).		P
2.6.105	Luminaires intended for use with independent controlgear		N/A
	For luminaires intended for use with independent controlgear, pictorial diagrams showing all dimensions for safe installation of the independent controlgear shall be included in the installation instructions.		N/A
	For luminaires not supplied with, but intended for use with, independent controlgear, the instructions supplied with the recessed luminaire shall specify the brand(s) and model(s) of independent controlgear that may be used.		N/A
	For luminaires that may be used with supplied independent controlgear or other independent controlgear, the instructions supplied with the recessed luminaire shall specify the brand(s) and model(s) of any other independent controlgear that may be used. The information on brand(s) and model(s) shall be in the instructions supplied with the luminaire or on a website referenced in the instructions supplied with the luminaire.		N/A
2.6.106	Compliance		P
	Compliance with Clauses 2.6.101 to 2.6.105 is checked by inspection and the relevant tests of AS/NZS 60598.1.		P
2.7	**Construction**		**P**
2.7.101	General The provisions of Section 4 of AS/NZS 60598.1 apply, along with the following.		P
2.7.102	Thermal protection devices		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Thermal protection devices that operate to enable the luminaire to comply with the requirements of this Standard shall be integral to, or permanently attached immediately adjacent to, the luminaire light source enclosure. Thermal protection devices that operate to enable the luminaire to comply with the requirements of this Standard shall not be separate devices or in independent controlgear. NOTE Thermal protection devices are also known as 'thermal cut-outs1.		N/A
	Single operation non-self-resetting thermal protection devices that are user replaceable are not permitted.		N/A
	Electronic controls that regulate the light output during abnormal operation tests to enable the luminaire to comply with the requirements of this Standard shall comply with Clause 2.7.103.		N/A
	Thermal protection devices, excluding electronic controls complying with Clause 2.7.103, that operate to enable the luminaire to comply with requirements of this Standard shall comply with IEC 60730-1, in conjunction with the relevant part of the IEC 60730-2 series.		N/A
	The number of cycles of operation declared in accordance with IEC 60730-1:2013 (see Clause 6.10 and 6.11 of that Standard) shall not be less than the following: a) Self-resetting thermal protection device 10 000 b) Voltage maintained non-self-resetting thermal protection device 1 000 c) Other non-self-resetting thermal protection device 30		N/A
2.7.103	Electronic controls		N/A
	The operation, or malfunction, of electronic controls that are used to regulate the operation of the light source to enable the luminaire to comply with requirements of this Standard (either during normal or abnormal operation) shall not result in a safety hazard. Such electronic controls are required to comply with a), b), c) or d) below:		N/A
	a) Electronic controls that operate during any test of this Standard and fully turn off the light source shall incorporate the operation of a thermal protection device component that complies with IEC 60730-1 with the number of cycles of operation declared in accordance with Clause 2.7.102.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	b) Electronic controls that operate during any test of this Standard and do not fully turn off the light source shall be by passed and the relevant test shall be repeated. The luminaire shall comply with the requirements of the relevant test with the electronic control bypassed and any remaining device that operates shall comply with IEC 60730-1 with the number of cycles of operation declared in accordance with Clause 2.7.102. NOTE This does not mean that any device has to operate to enable compliance with the relevant test.		N/A
	c)Electronic controls shall comply with the appropriate part of the AS/NZS 61347 series and incorporate a thermal protective device that has been tested to the number of cycles of operation declared in accordance with Clause 2.7.102.		N/A
	d)Electronic controls with programmable components (including embedded software) shall comply with IEC 62733, unless the luminaire complies with the requirements of this Standard with the electronic controls bypassed.		N/A
2.7.104	Controlgear		P
	All controlgear (including controlgear that is a component part and all independent controlgear) that is supplied with, or specified in, the instructions supplied with the luminaire for use with the luminaire shall be assessed with the luminaire to this Standard and shall, in addition, comply with the appropriate part of the AS/NZS 61347 series.		P
2.13	**Endurance tests and thermal tests**		**P**
2.13.101	General The provisions of Section 12 of AS/NZS 60598.1 apply together with the requirements of this Clause (Clause 2.13). Clause 12.4 and 12.5 of AS/NZS 60598.1 are applied in conjunction with the following:		P
	a) For Non-IC and Do-not-cover luminaires, the requirements of Clauses 12.4 and 12.5 of AS/NZS 60598.1 are modified by Clause 2.13.102		N/A
	b) For CA90 and CA135 luminaires, the requirements of Clauses 12.4 and 12.5 of AS/NZS 60598.1 are modified by Clause 2.13.103		N/A
	c) For IC and IC-4 luminaires, the requirements of Clauses 12.4 and 12.5 of AS/NZS 60598.1 are modified by Clause 2.13.104.	IC	P
2.13.102	Thermal tests for Non-IC and Do-not-cover luminaires		N/A

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

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Clause	Requirement + Test	Result - Remark	Verdict
	CA90 and CA135 luminaires shall be tested in accordance with the requirements of Paragraph ZA4. When the luminaire is tested in accordance with Paragraph ZA4, no temperature shall exceed— a) 90 °C on the luminaire mounting surface, or on any of the internal surfaces of the side and top of the test box, or on the surface of any building element installed in accordance with the manufacturer's instructions; b) for CA90 luminaires—90 °C on the outside surface of the luminaire accessible to the relevant test probe of Clause 2.14; c) for CA135 luminaires—135 °C on the outside surface of the luminaire accessible to the relevant test probe of Clause 2.14; and d) for other parts, the appropriate values given in Tables 12.1 and 12.2 of AS/NZS 60598.1. There shall be no damage to the luminaire such as scorching, deformation or melting. During the test, no thermal protection device or electronic control that fully turns off the light source within the luminaire or independent controlgear shall operate.		N/A
2.13.103.2	Abnormal operation test for CA90 and CA135 luminaires		N/A
	CA90 and CA135 luminaires shall be tested in accordance with the requirements of Paragraph ZA5. When the luminaire is tested in accordance with Paragraph ZA5, no temperature shall exceed— a) 90 °C on the luminaire mounting surface; b) for CA90 luminaires—130 °C on the outside surface of the luminaire accessible to the relevant test probe of Clause 2.14; and c) for CA135 luminaires—150 °C on the outside surface of the luminaire accessible to the relevant test probe of Clause 2.14. There shall be no damage to the luminaire such as scorching, deformation or melting. During the test, thermal protection devices or electronic controls within the luminaire may operate, however, the thermal protection devices of any independent controlgear shall not operate to limit temperatures		N/A
2.13.104	Thermal tests for IC and IC-4 luminaires		P

IEC 60598-2-22_ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	IC and IC-4 luminaires shall be tested in accordance with the requirements of Paragraph ZA6. When the luminaire is tested in accordance with Paragraph ZA6, no temperature shall exceed— a) 90 °C on the luminaire mounting surface; b) 90 °C on the outside surface of the luminaire accessible to the relevant test probe of Clause 2.14; and c) for other parts, the appropriate values given in Tables 12.1 and 12.2 of AS/NZS 60598.1. There shall be no damage to the luminaire such as scorching, deformation or melting. During the test, no thermal protection device, or electronic control that fully turns off the light source, within the luminaire or independent controlgear shall operate.		P
2.14	**Resistance to dust and moisture**		**N/A**
2.14.101	General The provisions of Section 9 of AS/NZS 60598.1 apply, along with the following. For luminaires with an IP classification greater than IP20, and for CA90, CA135, IC and IC-4 luminaires, the order of the tests specified in Section 9 of AS/NZS 60598.1 shall be as specified in Clause 2.3 of this Standard.		N/A
2.14.102	Ingress test for CA90 and IC luminaires		N/A
	Solid foreign objects shall have limited access to the hot surfaces of CA90 and IC luminaires. Test probe 19 of IEC 61032 shall be applied without appreciable force to all external surfaces and any opening of the luminaire. Test probe 19 shall not be applied to the access face. The 5.6 mm diameter of the probe shall not enter into an area where the temperature of any surface (including parts of the luminaire or the lamp) exceeds the temperature limit for ‘mounting surface: normally flammable surface’ of AS/NZS 60598.1, when the surface is measured while the luminaire is operated in accordance with the thermal test conditions of Paragraph ZA4 for CA90 luminaires and Paragraph ZA6 for IC luminaires.		N/A
2.14.103	Ingress test for CA135 luminaires—New Zealand only		N/A
2.14.103.1	Solid foreign objects shall have some access to the hot surfaces of CA135 luminaires. Compliance is verified in accordance with Clauses 2.14.103.2 and 2.14.103.3		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
2.14.103.2	Test probe 1 of IEC 61032 shall be applied without appreciable force to all external surfaces and any opening of the luminaire. Test probe 1 is not applied to the access face. The 50 mm diameter of the probe shall not enter into an area where the temperature of any surface (including parts of the luminaire or the lamp) exceeds a value of 135 °C, when the surface is measured while the luminaire is operated in accordance with the thermal test conditions of Paragraph ZA4.		N/A
2.14.103.3	The total area of all openings in the luminaire body that allows airflow through the luminaire (i.e. airflow between the ceiling/wall space and the illuminated area), excluding openings in the access face, shall be no more than 5 % of the area of the opening in the mounting surface (opening in mounting surface as required by the manufacturer to insert the luminaire).		N/A
2.14.104	Ingress test for IC-4 luminaires		N/A
	Solid foreign objects shall have restricted access to the hot surfaces of IC-4 luminaires and restricted access to the open area that allows airflow through the luminaire (i.e. between the area that the body of the luminaire is located in and the area that the light source illuminates). The IP4X probes of AS 60529 shall be applied to the complete luminaire and any opening of the luminaire including the access face. The IP4X probes of AS 60529 shall be applied without appreciable force and shall not enter any area of the luminaire where the temperature of any surface (including parts of the luminaire or the lamp) exceeds the temperature limit for ‘mounting surface: normally flammable surface’ of AS/NZS 60598.1, when the surface is measured while the luminaire is operated in accordance with the thermal test conditions of Paragraph ZA6. With the luminaire installed in accordance with the manufacturer’s instructions, the IP4X probes of AS 60529 shall not be able to pass from the illuminated area into the area where the body of the luminaire is situated.		N/A

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

APPENDIX ZA	**THERMAL TEST PROCEDURES FOR RECESSED LUMINAIRES**		**P**
ZA1	**GENERAL** **For the purposes of this Appendix, the requirements of Clause 12 of AS/NZS 60598.1 apply, with the following modifications and additions:**		**P**
	(a) A luminaire with a filament light source is energized at 1.05 times the rated wattage. Luminaires with other light sources are energized at 0.94 or 1.06 times the rated voltage, whichever produces higher temperatures.		N/A
	(b) Light sources controlled by independent controlgear have this gear energized at 0.94 or 1.06 times the rated voltage, whichever produces higher temperatures.		P
	(c) The test is run until temperatures have stabilized or 8 h have elapsed.		P
	(d) The test box shall be positioned in a draught-proof thermal room at a temperature of 25 °C ±5 °C, or at the ta rating of the luminaire ±5 °C, if the luminaire is marked with a ta rating, whichever is the greater.	40 °C	P
	(e) Any luminaire independent controlgear shall be installed in accordance with the installation instructions.		P
	(f) Where a recessed luminaire consists of a light source part supplied with another separate component part (for example, a driver or ballast or control device) connected by an interconnecting cord, then additional tests may be required so as to ensure the highest temperatures for all parts during all tests have been obtained. Such combinations of tests may include, but are not limited to, the following: (i) the separate component part placed under insulation in the test box; (ii) the separate component part placed on insulation in the test box; (iii) the separate component part placed above insulation in the test box; (iv) the separate component part placed outside the test box (where the tests involve the test box being filled with insulation).		P
	(g) If the instructions for installation indicate that multiple building elements or thermal insulation, or both, may be installed, the tests are conducted with the worst case combination of either building elements		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

ZA2	**TEST BOX**		**P**
ZA3	**TEST PROCEDURE FOR NON-IC AND DO-NOT-COVER LUMINAIRES**		**N/A**
ZA3.1	General This procedure includes assessing the suitable proximity of— (a) Non-IC and Do-not-cover luminaires to normally flammable building elements; and (b) Do-not-cover luminaires to any thermal insulation specified by the manufacturer in the installation instructions (see Clause 2.6.104).		N/A
ZA3.2	Test set-up		N/A
ZA3.2.2	General		N/A
ZA3.2.2	Non-IC luminaires		N/A
ZA3.2.3	Do-not-cover luminaires		N/A
ZA3.2.4	Test requirements and procedure shall be in accordance with Paragraph ZA1		N/A
ZA4	**TEST PROCEDURE FOR CA90 AND CA135 LUMINAIRES**		**N/A**
ZA4.1	General This test procedure is for CA90 and CA135 luminaires, for assessing the suitability of the luminaire to abut normally flammable materials, as specified in the installation instructions.		N/A
ZA4.2	Test set-up		N/A
ZA4.3	Test requirements and procedure shall be in accordance with Paragraph ZA1		N/A
ZA5	**TEST PROCEDURE FOR ABNORMAL OPERATION—DO-NOT COVER, CA90 AND CA135 LUMINAIRES**		**N/A**
ZA5.1	General This test procedure is for Do-not-cover, CA90 and CA135 luminaires, for assessing the suitability of the luminaire to abut normally flammable materials, as specified in the installation instructions.		N/A
ZA5.2	Test set-up		N/A
ZA5.3	Test requirements and procedure shall be in accordance with Paragraph ZA1		N/A
ZA6	**TEST PROCEDURE FOR NORMAL OPERATION—IC AND IC-4 LUMINAIRES**		**P**
ZA6.1	Test set-up		P
ZA6.2	Test requirements and procedure shall be in accordance with Paragraph ZA1	See Tabel 12.1 on IEC 60598-1	P

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Clause	Requirement + Test	Result - Remark	Verdict

	Attachment 5: Additional test according to IEC 61347-2-7:2011+A1:2017 used in conjunction with IEC 61347-1:2015 +A1:2017 and EN 61347-2-7:2012 used in conjunction with EN 61347-1: 2015+A1:2021	—

4 (4)	**GENERAL REQUIREMENTS**		**P**
- (4)	Insulation materials for double or reinforced insulation according requirements in Annex N of IEC 61347-1	(see Annex N)	P
- (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)	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	**MARKING (no request for integral controlgear)**		**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
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	l) value of tc		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		N/A
	- symbol if the controlgear is provided with automatic test function		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 of 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) heat sink required		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) for fluorescent lamp controlgear		N/A
	- emergency output factor (EOFX) for LED controlgear		N/A
	- relevant output parameter for LED controlgear for emergency operation only		N/A
	- minimum and maximum output voltage load for LED controlgear providing constant current		N/A
	- limits of ambient temperature range within which the ballast will start and operate		N/A
	- 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

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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
	- reference only to 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	Protected by enclosure of luminaire	P
- (A2)	Voltage measured with 50 kΩ	(see Annex A)	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 ..... :	0 V after 1 min.	P
- (10.3)	**Controlgear providing SELV**		**P**
	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		P
	SELV outputs separated by at least basic insulation		N/A
	ELV conductive parts insulated as live parts		N/A
	Tests according Annex L of IEC 61347-1	(See Annex L)	P

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Clause	Requirement + Test	Result - Remark	Verdict
- (10.4)	**Accessible conductive parts in SELV circuits**		**P**
	Output voltage under load ≤ 25 V r.m.s. or ≤ 60 V d.c.	8.19 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 capacitors	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**		**P**
- (8.1)	**Integral terminals**		**N/A**
	Screw terminals according section 14 of IEC 60598-1:		N/A
	Part of the controlgear	(see Annex 2)	N/A
	Screwless terminals according section 15 of IEC 60598-1:		N/A
	Part of the controlgear	(see Annex 3)	N/A
- (8.2)	**Terminals other than integral terminals**		**P**
	Comply with relevant IEC standard	(see Annex 1)	P
	Suit the conditions		P
	Satisfy additional relevant requirements of this standard		P
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
	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
	Test according 7.2.3 of IEC 60598-1		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
- (9.2)	Provision for functional earthing		N/A
	Comply with clause 8 and 9.1		N/A
	Functional earth insulated from live parts by double or reinforced insulation		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
	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 .....:	Between live parts of different polarity (fuse opened): > 100 MΩ.	P
	For double or reinforced insulation ≥ 4 MΩ .....:	Between input circuit and output circuit: > 100 MΩ.	P
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1	See Annex L	P

IEC 60598-2-22_ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
12 (12)	**ELECTRIC STRENGTH**		**P**
- (12)	Immediately after clause 11 electric strength test for 1 min		P
	Basic insulation for SELV, test voltage 500 V	Between live parts of output and lamp enclosure	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	Between live parts of different polarity (fuse opened): 1480 V	P
	Supplementary insulation, 2U + 1000 V		N/A
	Double or reinforced insulation, 4U + 2000 V	Between input circuit and output circuit: 2960 V (based on working voltage max. 240 V r.m.s.)	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		P
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	Test current: 198.9 mA Rated current: 200 mA	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	Not fluorescent lamp	N/A

IEC 60598-2-22_ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
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, EOFX)**		**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
	- lowest value measured at 60 s and V1 or in steady conditions at Vmin be retained and reach at least the declared EBLF .....:		N/A
	- value measured at 5 s and V1 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 V1 or in steady conditions at Vmin 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: EOFI and Iemergency		P
	- lowest value measured at 60 s and V1 or Vmin retained and reach at least the declared Iemergency and EOFI.....:	SP2001DA-WH: Min. 0.0547 A 0.05 A (rated) SP2003DA-WH: Min. 0.1086 A 0.1 A (rated) SP2002DA-WH: Min. 0.1086 A 0.1 A (rated)	P
	- value measured at 5 s and V1 reach at least 50 % of current Iemergency .....:	SP2001DA-WH: 0.0547 A 0.05 A (rated) SP2003DA-WH: 0.1087 A 0.1 A (rated) SP2002DA-WH: Min. 0.1086 A 0.1 A (rated)	P
	- controlgear declared for high-risk task area lighting, lowest value measured at 0,5 s and V1 retained and reach at least the declared Iemergency and EOFI:		N/A
21 (-)	**CHANGEOVER 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).....:	155 V (limit: 144 V-187 V)	P
	Supply reduced within 0,5 s to 0,6 times rated voltage, emergency lamps operated		P

IEC 60598-2-22_ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	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
	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	0.9 x 220 V = 198 V; 25 °C	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	0.9 x 220 V = 198 V; 40 °C	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	1.1 x 240 V = 264 V; 40 °C	P
	- no flames, molten material or flammable gases		P
	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		N/A
22.4 (-)	Maximum output voltage		P

IEC 60598-2-22_ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	Output voltage of recharging device ≤ 50 V r.m.s. at 1,1 times rated supply voltage with or without batteries connected (V)..... :	With batteries:3.16 V Without batteries: 3.69 V	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	0.9 x 220 V = 198 V 1.1 x 240 V = 264 V	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 A	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) ..... :	3.5 V (for refer)	P
	- Discharge current (A) ..... :	0.0001 A (for refer)	P

24 (-)	**INDICATOR**		**P**
	Compliance with 22.6.7 of IEC 60598-2-22		P

25 (-)	**REMOTE CONTROL, REST MODE, INHIBITION MODE**		**P**
25.1 (-)	No other changeover device than the switch between the battery and emergency lighting lamps		P
	Not contain manual or non-self-resetting switch isolating the emergency circuit from main supply		P
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

IEC 60598-2-22_ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
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) .....:	25 °C	P
	- 1 h at maximum ambient temperature (°C) .....:	40 °C	P
26.b (-)	Endurance test 50 h at an ambient that produces tc; ambient temperature (°C) .....:	No tc declared and done at 40 °C	P
	After test, controlgear restart and operate lamps at rated operating voltage		P
27 (-)	**POLARITY REVERSAL**		**N/A**
	If declared to be proof against polarity reversal, operating with reverse supply voltage for 1 h at maximum rated voltage		N/A
	After test, supply connected correctly, start and operate lamps normally		N/A
28 (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)	N/A
- (14.3)	Short-circuit or interruption of semiconductor devices	(see appended table)	P

IEC 60598-2-22_ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
- (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
	Short-circuit or interruption of SPDs	(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
- (14.7)	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**		**N/A**
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		N/A
- (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**		**P**
	No dangerous compatibility between output socket-outlet and a plug for socket-outlets for input circuit in relation to installation rules, voltages and frequencies		P
	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		P
	- socket-outlets without protective earth		P
- (15.4)	**Insulation between circuits and accessible parts**		**P**
- (15.4.2)	SELV circuits		P
	Source used to supply SELV circuits:		P
	- safety isolating transformer in accordance with relevant part 2 of IEC 61558		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- controlgear providing SELV in accordance with relevant part 2 of IEC 61347		P
	- another source	Batteries	P
	Voltage in the circuit not higher than ELV		P
	SELV circuits insulated from LV by double or reinforced insulation		P
	SELV circuits insulated from non SELV circuits by double or reinforced insulation		N/A
	SELV circuits insulated from FELV circuits by supplementary insulation		N/A
	SELV circuits insulated from other SELV circuits by basic insulation		N/A
	SELV circuits insulated from accessible conductive parts according Table 6 in 15.4.5		N/A
- (15.4.3)	FELV circuits	DALI circuit	P
	Source used to supply FELV circuits:		P
	- separating transformer in accordance with relevant part 2 of IEC 61558		N/A
	- separating controlgear providing basic insulation between input and output circuits in accordance with relevant part 2 of IEC 61347		P
	- another source		N/A
	- source in circuits separated by the LV supply by basic insulation		N/A
	Voltage in the circuit not higher than ELV		P
	FELV circuits insulated from LV supply by at least basic insulation		P
	FELV circuits insulated from other FELV circuits if functional purpose		N/A
	FELV circuits insulated from accessible conductive parts according Table 6 in 15.4.5		N/A
	Plugs and socket-outlets for FELV system comply with:		N/A
	- plugs not able to enter socket-outlets of other voltage systems		N/A
	- socket-outlets not admit plugs of other voltage systems		N/A
	- socket-outlets have a protective conductor contact		N/A
- (15.4.4)	Other circuits		N/A
	Insulation between circuits other than SELV or FELV and accessible conductive parts in according Table 6 in 15.4.5.		N/A
- (15.4.5)	Insulation between circuits and accessible conductive parts		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Accessible conductive parts insulated from active parts of electric circuits by insulating according Table 6		P
	Requirements for Class II construction with equipotential bonding for protection against indirect contact with live parts:		N/A
	- all conductive parts are connected together		N/A
	- conductive parts are reliably connected together according test of IEC 60598-1 cl. 7.2.3		N/A
	- conductive parts comply with requirements of Annex A in case of insulation fault		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
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		P
	Creepage distances according to Table 8	(see appended table)	P
- (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		P
	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)	P

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

31 (17)	**SCREWS, CURRENT-CARRYING PARTS ANDCONNECTIONS**		**P**
- (17)	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
(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 Test Table 32 (18.1)	P
- (18.2)	Test of printed boards .....:	See Test Table 32 (18.2) PCB complies with V-0, it also complies with cl. 8.7 of IEC 61189-2 and relevant parts of IEC 61249-2.	N/A
- (18.3)	Glow-wire test .....:	See Test Table 32 (18.3)	N/A
- (18.4)	Needle flame test .....:	See Test Table 32 (18.4)	P
- (18.5)	Tracking test .....:	See Test Table 32 (18.5)	P

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Clause	Requirement + Test	Result - Remark	Verdict
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
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	- does not produce flammable gases		P
	- protection against accidental contact according 10.1 of IEC 61347-1 not impaired		P
	- insulation resistance ≥ 1 MΩ ..... :	≥ 100 MΩ	P

35	**Protection of associated components**		**N/A**
35.1	**Controlgear for fluorescent lamps**		**N/A**
35.1.1	Peak voltage limits		N/A
	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

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Clause	Requirement + Test	Result - Remark	Verdict

18	**TABLE: maximum current in any lead (Only apply to fluorescent lamps)**						**N/A**
	Test voltage (V):						
I 1 (mA)	I 2 (mA)	I 3 (mA)	I 4 (mA)	I 5 (mA)	I 6 (mA)	I 7 (mA)	I 8 (mA)
--	--	--	--	--	--	--	--

28 (14)	**TABLE: tests of fault conditions**	**P**
Part	Simulated fault	Hazard
Charging with empty battery (maintained)		
C2	Short-circuit: Fuse open, change to emergency mode.	NO
R5	Short-circuit: change to emergency mode, can be recoverable	NO
C4	Short-circuit: change to emergency mode, can be recoverable	NO
R7	Short-circuit: Worked as normal	NO
IC2(1-2)	Short-circuit: Fuse open, change to emergency mode.	NO
IC2(3-4)	Short-circuit: change to emergency mode, can be recoverable	NO
TR1(1-2)	Short-circuit: Fuse open, change to emergency mode.	NO
TR1(3-4)	Short-circuit: Fuse open, change to emergency mode.	NO
TR1(A-B)	Short-circuit: Fuse open, change to emergency mode.	NO
R36	Short-circuit: Worked as normal	NO
Q10 (B-C)	Short-circuit: Worked as normal	NO
Q10(C-E)	Short-circuit: Worked as normal	NO
Q10(B-E)	Short-circuit: Worked as normal	NO
D12	Short-circuit: Worked as normal	NO
D7	Short-circuit: Worked as normal	NO
Output (20cm)	Short-circuit: charging mode damaged.	NO
Output (200cm)	Short-circuit: charging mode damaged.	NO
Output	Double load: Unit shut down, can be recoverable	NO
Output	Open-circuited: 3.68 V	NO
Subsidiary board		
Opto-coupler (1-2)	Short-circuit: Worked as normal	NO
Opto-coupler (3-4)	Short-circuit: Worked as normal	NO
C1	240V, 0.046A, 3.68W, Power rise, Re.	NO

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Clause	Requirement + Test	Result - Remark	Verdict

Discharging with full battery		
R22	Short-circuit: Worked as normal	NO
D12	Short-circuit: Worked as normal	NO
C15	Short-circuit: Unit shut down, can be recoverable	NO
Q5 (B-C)	Short-circuit: Worked as normal	NO
Q5(C-E)	Short-circuit: Unit shut down, can be recoverable	NO
Q5(B-E)	Short-circuit: 3.52V, 0.07A, Power decrease, recoverable	NO
LED module	Short-circuit: Unit shut down, can be recoverable	NO

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

30 (16)	TABLE: clearance and creepage distance measurements (mm) Refer to attachment 7							P
Applicable part of IEC 61347-1 Table 7 – 11*								
Distances	**Insulation type ****	**Measured clearance**	**Required**		**Measured creepage**	**Required**		
			clearance	***Table**		**creepage**	***Table**	
Distance 1:								
Working voltage (V) ..... :								—
Frequency if applicable (kHz) ..... :								—
PTI..... :					< 600 ☐	≥ 600 ☐		—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :								—
Pulse voltage if applicable (kV) ..... :								—
Supplementary information:								
Distance 2:								
Working voltage (V) ..... :								—
Frequency if applicable (kHz) ..... :								—
PTI..... :					< 600 ☐	≥ 600 ☐		—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :								—
Pulse voltage if applicable (kV) ..... :								—
Supplementary information:								
Distance 3:								
Working voltage (V) ..... :								—
Frequency if applicable (kHz) ..... :								—
PTI..... :					< 600 ☐	≥ 600 ☐		—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :								—
Pulse voltage if applicable (kV) ..... :								—
Supplementary information:								

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

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

32 (18.1)	TABLE: Ball Pressure Test			P
Allowed impression diameter (mm) .....:		2		—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
Bobbin	See Annex 1	125	0.4	
PCB of controlgear	See Annex 1	125	0.5	
Supplementary information: None				

32 (18.2)	TABLE: Test of printed boards				N/A
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (s)	Ignition of specified layer Yes/No	Duration of burning (s)	Verdict
Supplementary information:					

32 (18.3)	TABLE: Glow-wire test			N/A
Glow wire temperature .....:		650 °C		—
Object/ Part No./ Material	Manufacturer/ trademark	Ignition of specified layer Yes/No	Duration of burning (s)	Verdict
Supplementary information: None				

32 (18.4)	TABLE: Needle-flame test				P
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (s)	Ignition of specified layer Yes/No	Duration of burning (s)	Verdict
Screwless terminal block of controlgear	See Annex 1	10	No	0	P
Bobbin	See Annex 1	10	No	0	P
PCB of controlgear	See Annex 1	10	No	0	P
Supplementary information: None					

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Clause	Requirement + Test	Result - Remark	Verdict

32 (18.5)	**TABLE: Proof tracking test**				**P**
Test voltage PTI :		175 V			—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
Bobbin	See Annex 1	Specimen 1	Specimen 2	Specimen 3	P
PCB of controlgear	See Annex 1	Specimen 1	Specimen 2	Specimen 3	P
Supplementary information: According to below test condition to Verdict: A failure has occurred if a current of 0,5 A or more flows for at least 2 s by a conducting path between the electrodes on the surface of the specimen.					

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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		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

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		—
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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
	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
	After 15 min value not exceed marked value		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		P
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) (the battery had tested in IEC 60598-2-22)		**P**
(A.1)	Type of batteries	Lithium battery	P
(A.2)	Conform to relevant standard		P

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Clause	Requirement + Test	Result - Remark	Verdict
	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
(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

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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		P
- (L)	**ANNEX L IN PART 1: PARTICULAR ADDITIONAL REQUIREMENTS FOR CONTROLGEAR PROVIDING SELV**		**P**
- (L.3)	**Classification**		**P**
	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 9.2 of IEC 61558-1	0 V after 1 s.	P
- (L.6)	**Heating**		**P**
	No excessive temperatures in normal use		P
	Value if capacitor t_c marked .....:	Electrolytic Capacitor: 105 °C X capacitor: 100 °C Y capacitor: 125 °C	—
	Winding insulation classified as Class .....:	B	—
	Comply with tests of clause 14 of IEC 61558-1 with adjustments		P
- (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

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Clause	Requirement + Test	Result - Remark	Verdict
	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 .....:	3750 V	P
	2) Over basic or supplementary insulation between:		P
	a) live parts having different polarity .....:	1500 V	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		N/A
	HF transformer comply with 19 of IEC 61558-2-16		P
- (L.10)	**Components**		**N/A**
	Protective devices comply with 20.6 – 20.11 of IEC 61558-1		N/A
- (L.11)	**Creepage distances and clearances**		**P**
	Creepage distances and clearances not less than in Clause 16		P
	Distance through insulation according Table L.5 in IEC 61347-1		P
	1) Basic distance through insulation		P
	Required distance (mm) .....:		—
	Measured (mm) .....:	See attachment 7	P
	Supplementary information		P
	2) Supplementary distance through insulation		N/A
	Required distance (mm) .....:		—
	Measured (mm) .....:		N/A
	Supplementary information		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	3) Reinforced distance through insulation		P
	Required distance (mm) .....:		—
	Measured (mm) .....:	See attachment 7	P
	Supplementary information		P
- (N)	**ANNEX N IN PART 1: REQUIREMENTS FOR INSULATION MATERIALS USED FOR DOUBLE OR REINFORCED INSULATION**		**P**
- (N.4)	**General requirements**		**P**
- (N.4.1)	Material comply with IEC 60085 and IEC 60216 series		P
- (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**		**P**
- (N.4.3.1)	Thickness and composition of thin sheet insulation		P
	- 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		P
- (N.4.3.2)	Mandrel test (electric strength test during mechanical stress)		P
	Electric strength test after mandrel test:		P
	- 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	5 kV	P
	- 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		P
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

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Clause	Requirement + Test	Result - Remark	Verdict
	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 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 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

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Clause	Requirement + Test	Result - Remark	Verdict
O.17	**Resistance to heat and fire**		**N/A**
	Clause 32 (18)	See clause 32	N/A
O.18	**Resistance to corrosion**		**N/A**
	Clause 33 (19)	See clause 33	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	Attachment 6: Additional test according to AS/NZS 61347.1:2016 + A1:2018 and AS 61347.2.7:2019	**P**

National Differences – Australia			
AS/NZS 61347.1:2016 + A1:2018			
ZZ1	**SCOPE**		**--**
	This Appendix sets out variations between this Standard and IEC 61347-1 Ed.3.0 (2015) and additional requirements to cover issues that have not been addressed by the International Standard. These variations indicate national variations for the purposes of the IECEE CB Scheme and will be published in the IECEE CB Bulletin.		**--**
ZZ2	**VARIATIONS**		**--**
	The following variations are required in Australia and New Zealand:		--
1	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”.		P
2	Add the following new normative references: AS/NZS 3191, Electric flexible cords; 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 61535, Installation couplers		P
1 (AMDT No.1)	At the end of the existing variation to Clause 1, add the following text: 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.		P

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Clause	Requirement + Test	Result - Remark	Verdict
2 (AMDT No.1)	Add the following new normative references to the variations to clause 2: AS 60529, Degrees of protection provided by enclosures (IP code) AS/NZS 4859.1, Materials for the thermal insulation of buildings-General criteria and technical provisions AS/NZS 61347, Lamp controlgear (all parts)		P
4	**General requirements**		--
	1 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.		N/A
	2 At the end of the clause, add new Clause 4.101 as follows:		N/A
4.101	**Supply connection wiring**		--
	Independent lamp controlgear shall be provided with only one of the following means of connection to the LV supply. The means of connection shall be on the following:		N/A
	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.		N/A
	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.		N/A
	NOTE 1 Requirements for equipment with integral pins are shown in AS/NZS 3112 Appendix J ‘Equipment with integral pins for insertion into socket-outlets’.		N/A
	NOTE 2 Requirements for supply cords used as a means of connection to the supply are shown in AS/NZS 60598.1.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	NOTE 3 Independent and built-in controlgear compliance examples are as follows: a) An Independent LED power supply (known in Australia/New Zealand as a driver) is required to comply with the relevant requirements of AS/NZS 61347.2.13, AS/NZS 61347.1 and AS/NZS 60598.1. b) A built in LED power supply (driver) is required to comply with the relevant requirements of AS/NZS 61347.2.13, AS/NZS 61347.1 and after the built-in LED power supply is installed in a luminaire it is required to comply with the relevant requirements of the appropriate part of AS/NZS 60598.2 standard for that luminaire type.		N/A
1 (AMDT No. 1)	Delete the first variation Clause 4.		--
2 (AMDT No. 1)	Add the following new variation after Clause 4.101		--
	Add new Clause 4.102 and 4.103 as follows:		--
4.102 (AMDT No.1)	**General**		--
	The resistance to dust and solid object provision of Section 9 of AS/NZS 60598.1 apply, excluding the humidity test, along with the following:		N/A
	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 (AMDT No.1)	**Ingress test for IC classified controlgear**		**N/A**
	Solid foreign objects shall have restricted access to the hot surfaces of IC classified controlgear.		N/A
5	**General notes on tests**		--
	At the end of Clause 5, add new Clause 5.101 as follows:		--
5.101	**Controlgear voltage**		--

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Clause	Requirement + Test	Result - Remark	Verdict
	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 240V for single-phase equipment or a rated voltage of at least 415V for three-phase equipment; or - a rated voltage range that includes 240V for single-phase equipment and 415V for three-phase equipment. the rated supply voltage for controlgear shall be equal to 240V for single-phase equipment and 415V for three-phase equipment. The upper limit for the voltage range shall be equal to 240V for single-phase equipment and 415V for three-phase equipment.	220-240 V	P
5 (AMDT No.1)	Add a second variation to Clause 5, after Clause 5.1.1, as follows:		--
	Add new Clause 5.102, 5.103 and 5.104 as follows:		--
5.102 (AMDT No.1)	**Independent controlgear for use near or in contact with building material or insulation**		**--**
	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 (AMDT No.1)	**Thermal tests for “Do-not-Cover” classified controlgear**		**--**
5.103.1 (AMDT No.1)	**“Do not - cover” controlgear, normal operation test**		**--**
	Controlgear classified as “Do not Cover” shall be tested in accordance with the requirement of Clause 5.5.		N/A
5.103.2 (AMDT No.1)	**“Do-not-Cover” classified controlgear, abnormal operation test**		**--**
	Controlgear classified as “Do not Cover” shall be tested in accordance with the requirments of Paragraph ZA3.		N/A
	When the “Do not Cover” controlgear is tested in accordance with Paragraph ZA3, no temperature shall exceed -		N/A
	a) 90°C on the mounting surface of the test box; and		N/A
	b) 130°C on the outer surface of the controlgear.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	There shall be no damage to the controlgear such as scorching, deformation or melting. During the test, thermal protective devices or electronic controls within the controlgear may operate to limit temperatures.		N/A
5.104 (AMDT No.1)	**Thermal tests for "IC" controlgear**		**--**
	Controlgear classified as "IC" shall be tested in accordance with the requirement of Paragraph ZA3.		N/A
	When the "IC" controlgear is tested in accordance with Paragraph ZA3, no temperature shall exceed –		N/A
	a) 90°C on the controlgear mounting surface; and		N/A
	b) the lesser of tc or 90°C on the outside surface of the controlgear or other places accessible to the relevant test probe of Clause 4.103.		N/A
	There shall be no damage to the controlgear such as scorching, deformation or melting. During the test, no thermal protective devices or electronic controls that fully turns off the controlgear shall operate.		N/A
6(6.101)	**Independent controlgear classification**		**N/A**
	Independent controlgear shall be classified as one of the following:		N/A
	a) Do-not-Cover.		N/A
	b) IC.		N/A
	c) Non IC.		N/A
7	**Marking**		**--**
7.1	**After the first paragraph, add the following text:**		**--**
	In Australia and New Zealand, information, instructions and other tests required by this standard shall be written in English.		N/A
	The marking of the rated voltage or rated voltage range shall include 240V for Australia and 230V for New Zealand.		N/A
	The information provided shall contain details related to components in controlgear requiring replacement as part of a maintenance program.		N/A
	FELV control terminals shall be marked with the warning symbol "Risk of electric shock" 		P

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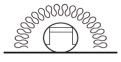
Clause	Requirement + Test	Result - Remark	Verdict
	Instructions shall be provided with controlgear that have FELV control terminals that state the following: WARNING: FELV terminals marked “Risk of electric shock” are not safe to touch.  		P
	WARNING: Circuits connected to any FELV control terminal shall be insulated for the LV supply voltage of the controlgear and any terminals connected to the FELV circuited shall be protected against accidental contact.		P
7.1 (AMDT No.1)	Delete Paragraph 2 in the existing variation:		N/A
	“the marking of the rated voltage or rated voltage range shall include 240V for Australia and 230V for New Zealand. ”		N/A
	Add the following new variation to Clause 7.1 after the existing variation: Add new Clause 7.101, 7.102, 7.103, 7.104 and 7.105 as follows:		N/A
7.101 (AMDT No.1)	**Controlgear classification symbol**		--
	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 shown in figure 701. 		N/A
	Controlgear classified as “IC” shall be marked with the symbol shown in figure 702. 		N/A
7.102 (AMDT No.1)	**Additional information to be supplied with the controlgear**		--
	“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.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	(b) If the minimum clearance distance from each side of the controlgear are different, or there are different minimum clearance distances for various types of normally flammable building element or building insulation, then each minimum clearance distance shall be stated separately.		N/A
	(c) Where controlgear is requirement to be mounted on a specific surface or has additional installation requirements, for example, use in non-combustible enclosed space or to ensure adequate sealing to maintain its IP rating, the relevant information shall be supplied with the controlgear.		N/A
7.103 (AMDT No.1)	**Independent controlgear**		--
	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 (AMDT No.1)	**Location and durability of marking**		--
	The marking required by Clause 7.101 shall be a minimum size of 5 mm x 5 mm.		N/A
7.105 (AMDT No.1)	**Compliance**		--
	Compliance with Clause 7.101 to 7.104 is checked by inspection.		N/A
10	**Protection against accidental contact with live parts**		--
10.1	**After the second paragraph, insert the following text:**		--
	For the purpose of this clause, FELV circuits are considered a live part.		N/A
15	**Construction**		--
15.3	**At the end of Clause 15.3, add new Clause 15.101 as follows:**		--
15.101	**Power factor correction capacitors**		--
	Power factor correction capacitors incorporated into controlgear shall be of a type to ensure that any capacitor failure results in a failsafe outcome (i.e. the capacitor type will fail in the open-circuit mode only and is protected against fire or shock hazard).		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	These capacitors shall be not less than Type B capacitors with metal body and break action protection in accordance with IEC 61048 and AS/NZS 61049.		N/A
	A capacitor complying with ANCI/EIA-456-A shall comply with AS/NZS 61049 and IEC 61048:2006, excluding the endurance test (Clause 18.1.1)		N/A
	NOTE capacitors of class P2 of IEC 60252 AC motor capacitors do not meet the safety requirements of a Type B capacitor		N/A
	In addition, capacitors shall have a minimum voltage rating of 250V at temperature rating of 85°C or 280V at temperature rating of 100°C.		N/A
	Capacitors likely to be permanently subjected to the supply voltage, and used for radio interference suppression or for voltage dividing, shall comply with IEC 60384-14.		N/A
18	**Resistance to heat, fire and tracking**		**--**
18.2	Resistance to flam and ignition		--
	Delete clause and replace with following:		--
18.2.1	General		--
	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 18.2.2 and 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.		P
	This clause applies to all parts, including components, even if they have been tested to their own standard.		P
18.2.2	Parts of non-metallic material supporting connections shall withstand the glow wire test.	See table 18.2.2	P
	The glow wire is heated to 750 °C and applied to one test sample for 30 s.		P
18.2.3	All other parts of non-metallic material shall withstand the glow wire test.	See table 18.2.3	P
	The glow wire is heated to 650 °C and applied to one test sample for 30 s.		P
18.2.4	During the application of the 750 °C glow wire test of Clause 18.2.2 if a flame is produced that persists for longer than 2 s, the controlgear is further test as follows:	See table 18.2.4	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	The needle-flame test of AS/NZS 60695.11.5 is applied to non-metallic parts that encroach within the envelop 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 AN/NZS 60695.11.5 are not tested.		N/A
	The test apparatus, test procedure and criteria shall be those described in AS/NZS 60695.2.10		N/A
	The needle flame is applied to one test sample for 30 s.		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 AS/NZS 60695.11.10. The sample of material classified in accordance with AS/NZS 60695.11.10 shall be no thicker than the relevant part.		N/A
18.2.5	PCBs in controlgear shall be subject to the needle-flame test of AS/NZS 60695.11.5	See table 18.2.5	P
	The test apparatus, test procedure and criteria shall be those described in AS/NZS 60695.11.5		P
	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.		P
	The duration of burning shall not exceed 15 s after removal of the needle flame.		P
	The needle-flame test is not carried out on PCBs made of material that is V-0 rated according to AS/NZS 60695.11.10		P
18.3	Delete and replace with the following:		--
	Lamp controlgear intended for building into luminaries other than ordinary, independent lamp controlgear, and lamp controlgear having insulation subject to starting voltages with a peak value higher than 1 500 V shall be resistant to tracking.		P
18.4	Delete clause.		--
18.5	Delete clause.		--
Bibliography	Add the following referenced documents:		N/A
	IEC 60252-1, AC motor capacitors — Part 1: General — Performance, testing and rating — Safety requirements — Guidance for installation and operation IEC 61417-1, Graphical symbols for use on equipment — Part 1: Overview and application		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

18.2.2	Glow wire test (750 °C)			P
Insulating Parts	**Flaming extinguish within 30 s**	**Flaming time (s)**	**Ignite of the tissue paper**	**Result**
PCB of LED controlgear	☐ Yes ☐ No ☒ No flame	0	☐ Yes ☒ No	P
Bobbin of transformer	☐ Yes ☐ No ☒ No flame	0	☐ Yes ☒ No	P
Screwless terminal block of controlgear	☐ Yes ☐ No ☒ No flame	0	☐ Yes ☒ No	P

18.2.3	Glow wire test (650 °C)			N/A
Insulating Parts	**Flaming extinguish within 30 s**	**Flaming time (s)**	**Ignite of the tissue paper**	**Result**
	☐ Yes ☐ No ☐ No flame		☐ Yes ☐ No	

18.2.4	Needle flame test			N/A
Insulating Parts	**Flaming extinguish within 30 s**	**Test duration**	**Ignite of the tissue paper**	**Result**
	☐ Yes ☐ No ☐ No flame		☐ Yes ☐ No	

18.2.5	Needle flame test for PCB			P
Insulating Parts	**Flaming extinguish within 15 s**	**Test duration**	**Ignite of the tissue paper**	**Result**
PCB of LED controlgear	☐ Yes ☐ No ☒ No flame	30	☐ Yes ☒ No	P

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

National Differences – Australia			
AS/NZS 61347.2.7: 2019 Variations to IEC 61347-2-7 (ED.3.1) for Australia			
ZZ1	This Appendix sets out variations between this Standard and IEC 61347-2-7 (ED.3.1) and additional requirements to cover issues that have not been addressed by the international standard. These variations indicate national variations for the purposes of the IECEE CB Scheme and will be published in the IECEE CB bulletin.		**P**
ZZ2	**VARIATIONS**		**P**
	The following modification are required for Australian conditions:		P
1	**Scope**	According to scope of AS/NZS 61347.2.7: 2019	**P**
2	**Normative references**	According to Normative references of AS/NZS 61347.2.7:2019	**P**
4	**General requirements**		**P**
	After third paragraph, add the following: NOTE: In Australia and New Zealand, the term “automatic test” is used to denote compliance to the automatic test function as specified in AS/NZS 2293.3.		P
7	**Marking**		**N/A**
7.1	1 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 IEC61347-1;	Integral controlgear and non-replaceable	N/A
	2 Delete third dash point and replace with the following text: -indication of type and current arting of the fuse, if the fuse is user replacable;		N/A
	3 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	1 second last dash point, delete “This to include:” and replace with the following: This information may be the battery model and manufacture or all of the following information:		N/A

IEC 60598-2-22_ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	2 Delete first sublist bullet point and replace with the following: . technology of the battery (e.g. NiCd, NiMH, Li-Ion, etc.)		P
	3 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
	After clause, add the following: For LED light sources the test in this clause in only conducted on one sample.		P
20	Functional safety (EBLF)		P
20.101 (new)	After heading, add the following: Functional safety in Australia For Australia only, the requirements of this section (20) are optional. EBLF criteria are not required in Australia.		P
20.1	1 delete fifth paragraph and replace with the following: For measurement of EBLF, voltage representative of a fully charged battery and the battery voltage present just before lamp extinguishing are used as follows: V1 Full charge battery voltage per cell dependent on battery type as followings: NiCd 1.35 V per cell NiMh 1.35 V per cell Pb 2.10 V per cell LiFePO4 3.65 V per cell $Li(NiCoMn)O_2$ 4.0 V per cell Vmin end of capacity batter voltage per cell dependent on battery type as follows: NiCd 1.10 V per cell NiMh 1.10 V per cell Pb 1.80 V per cell LiFePO4 2.0 V per cell $Li(NiCoMn)O_2$ 3.0 V per cell		**P**
	2 After Note 2, add the following: Note 3 Full charge and end of capacity battery cell voltage may be declared by battery manufacture or determined by test report to relevant IEC Standard.		P
20.2.1	1 Delete sixth paragraph and replace following: For the measurement of Iemergency and EOFI of the controlgear it is operated at a supply voltage which represents V1 and Vmin according to the following table:		N/A

IEC 60598-2-22_ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	V1 Full charge battery voltage per cell dependent on battery type as followings: NiCd 1.35 V per cell NiMh 1.35 V per cell Pb 2.10 V per cell LiFePO4 3.65 V per cell Li(NiCoMn)O_2 4.0 V per cell Vmin end of capacity batter voltage per cell dependent on battery type as follows: NiCd 1.10 V per cell NiMh 1.10 V per cell Pb 1.80 V per cell LiFePO4 2.0 V per cell Li(NiCoMn)O_2 3.0 V per cell		
	2 After clause, add the following: Note 3 Full charge and end of capacity battery cell voltage may be declared by battery manufacture or determined by test report to relevant IEC Standard.		N/A
22	Recharging device		P
	1 After first paragraph, add the following: For Australia the charging time is 16h.		P
	2 Delete second paragraph and replace with the following: Transformers built into controlgears for self-contained emergency luminaires for charging the batteries shall comply with the relevant requirements of IEC 61558- 2-1:2007, AS/NZS 61558.2.6:2009/AMD1:2012 or 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 61558.1:2018/AMD2:2015.		P
22.1	1 after first paragraph, add the following: This test shall be conducted at the lowest claimed operational temperature of the fitting.		P
	2 Delete Table 1 and replace with following:		P
	3 Delete second paragraph, and replace with the following: The values apply at an ambient temperature of (20+-5) ℃		P
	4 After third paragraph, add the following: For Australia the charging period is 16h.		P
23	Protection against excessive discharge		P
	Delete clause and replace with the following: Controlgear utilizing lead-acid batteries, and controlgear utilizing a battery of three or more nickel	Measured: 3.12 V >Vlow 2.0 V (battery manufacturer declaration of	P

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Clause	Requirement + Test	Result - Remark	Verdict
	cadmium cells in series, or a battery of one or more NiMH cells, or a battery of one or more Lithium cells, shall be protested against polarity reversal of individual cells. This protection shall be achieved by the incorporation of an electrical system that limits further battery discharge to the current specified below when the battery voltage has fallen to Vlow determined below in a) to d) The battery voltage shall not fall below Vlow and the discharge current shall not exceed that specified above at Vlow, If the battery cut-off switching point is greater than Vlow then a current greater than Ilow. Testing is conducted at 25°C ± 2°C. where a battery incorporates a built-in protection device, Ilow. shall be measured at the battery terminals. Note: This provision is intended to avoid an irreversible capacity loss due to a deep discharge of cells.	design)	
24	**Indicator**		**P**
	Delete clause and replace with the following: 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 inhibiton mode is implemented it shall be tested to these requirements. Where implemented, the luminaire shall not be supplied by the manufacturer with the luminaire in rest or inhibition mode.		N/A
25.6 (-)	If rest mode or inhibiting facilities, in rest mode, current drain from batteries not exceed the values in 25.6 of AS/NZS 61347-2-7		N/A
	- Discharge current (A) ..... :		N/A
29	**Construction**		**P**
	Delete first sentence and replace with the following: Controlgear supplied with batteries shall incorporate a battery that meets the requirements of Annex 1		P

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Clause	Requirement + Test	Result - Remark	Verdict

	Attachment 7: Creepage distance and clearance of integral controlgear	**P**

Power Supply	240 V / 60 Hz	Pollution degree	2
		Material group	IIIa

Type	Measuring Points	Frequency (Hz)	Measured Voltage (V)		Clearance Dist. (mm)		Creepage Dist. (mm)	
			V peak	V rms	Required a) / b)	Measured	Required a) / b)	Measured
B	Between DALI circuit and LV circuit	60	340	240	1.5 / 2.5	2.7	2.5 / 2.6	2.7
B	Measured on optocoupler U pri. to sec.	60	340	240	1.5 / 2.5	4.3	2.5 / 2.6	4.3
B	Measured on optocoupler U pri. to sec.	60	340	240	1.5 / 2.5	4.3	2.5 / 2.6	4.3
B	Measured between live parts of different polarity (before fuse)	60	340	240	1.5 / 2.5	3.0	2.5 / 2.6	3.0
B	Measured tracks under fuse (F1)	60	340	240	1.5 / 2.5	2.8	2.5 / 2.6	2.8
R	Measured on CY1 pri. to sec.	60	340	240	3.0 / 4.7	11	5.0 / 5.0	11
R	Measured on optocoupler IC2 pri. to sec.	60	340	240	3.0 / 4.7	6.4	5.0 / 5.0	6.4
R	Measured on TR1 pri. winding to sec. pins	61.0 k	452	240	3.0 / 4.7	6.3	5.0 / 5.0	6.3
R	Measured on TR1 pri. core to sec. pins	61.0 k	452	240	3.0 / 4.7	8.0	5.0 / 5.0	8.0
R	Measured on TR1 pri. core to sec. trace	61.0 k	452	240	3.0 / 4.7	5.0	5.0 / 5.0	5.2
R	The thickness of insulation tape wrapped transformer TR1	61.0 k	452	240	Required: 0.09* Measured: 0.15			
R	Measured on pri. track to sec. track	61.0 k	452	240	3.0 / 4.7	6.1	5.0 / 5.0	6.1

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Clause	Requirement + Test	Result - Remark	Verdict

Note: Transformer core considered as primary circuit.
B = Basic insulation, S= Supplementary insulation, R = Reinforce insulation.

a) Limits according to Table 7, 8, 9, 10 and 11 in IEC 61347-1: 2015+A1:2017.

DTI evaluated according to IEC 61347-1:2015+A1:2017, Annex L.11 Table L.5.

b) Limits according to Clause 26 of IEC 61558-1:2005.

*For transformers having a rated output of less than 25 VA, the figures in square brackets may be reduced to one-third of their value.

Note: for all emergency controlgear, they have same primary circuit.

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

	Attachment 8: Additional tests for LED module according to IEC 62031:2018 and EN IEC 62031:2020	**P**

4	**GENERAL REQUIREMENTS**		**P**
4.2	Classification		P
	Built-in module ..... :	Yes ☐ No ☒	—
	Independent module ..... :	Yes ☐ No ☒	—
	Integral module ..... :	Yes ☒ No ☐	—
4.6	Independent modules comply with requirements in IEC 60598-1:2014/AMD1:2017		N/A
4.8	Modules with integrated controlgear providing SELV comply with requirements according to IEC 61347-1:2015/AMD1:2017 clause L.5 to L.11.	(see Annex 1)	N/A

6	**MARKING (no request for integral LED module)**		**N/A**
6.2	**Contents of marking for built-in and for independent LED modules**		**N/A**
	a) mark of origin		N/A
	b) model number, type reference		N/A
	c1) constant voltage module; rated supply voltage and supply frequency		N/A
	c2) constant current module; rated supply current and supply frequency		N/A
	d) rated power		N/A
	e) indication of connections, wiring diagram		N/A
	f) value of t_c and place on the module		N/A
	g) Ethr if required		N/A
	h) symbol for built-in modules		N/A
	i) heat transfer temperature t_d		N/A
	j) power for heat-conduction P_d		N/A
	k) working voltage for insulation		N/A
6.3	**Location of marking for built-in LED modules**		**N/A**
	- marking of a) and b) in 6.2 on the modules		N/A
	- marking of other applicable items in 6.2 on the modules or in data sheet, leaflet or website		N/A
6.4	**Location of marking for independent LED modules**		**N/A**
	- marking of a), b), c) and f) in 6.2 on the modules		N/A
	- marking of other applicable items in 6.2 on the modules or in data sheet, leaflet or website		N/A
6.5	**Marking of integral LED modules**		**N/A**

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Clause	Requirement + Test	Result - Remark	Verdict
	- information in 6.2 a) to g) in data sheet, leaflet or website		N/A
6.6	**Durable and legibility of marking**		**N/A**
	- marking on the LED module legible after test with water		N/A
	- marking not on the LED module legible		N/A
7	**TERMINALS**		**N/A**
7.1	**Integral terminals**		**N/A**
	Screw terminals comply with section 14 of IEC 60598-1	(see Annex 3)	N/A
	Screwless terminals comply with section 15 of IEC 60598-1	(see Annex 4)	N/A
7.2	**Terminals other than integral terminals**		**N/A**
	Separately approved; component list	(see Annex 2)	N/A
	Ratings suit the conditions		N/A
	Satisfy additional relevant requirements of this standard		N/A
8 (9)	**EARTHING**		**N/A**
- (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
	Test according 7.2.3 of IEC 60598-1		N/A
- (9.2)	**Provision for functional earthing**		**N/A**
	Comply with clause 8 and 9.1		N/A
	Functional earth insulated from live parts by double or reinforced insulation		N/A
- (9.3)	**Lamp controlgear with conductors for protective earthing by tracks on printed circuit board**		**N/A**

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Clause	Requirement + Test	Result - Remark	Verdict
	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
	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
9 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		**N/A**
- (10.1)	Controlgear protected against accidental contact with live parts	The integral LED module relies upon the luminaire enclosure for protection against electric shock and is SELV-operated.	N/A
- (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		N/A
	Adequate mechanical strength on parts providing protection		N/A
- (10.2)	Capacitors > 0,5 μF: voltage after 1 min (V): < 50 V .....:		N/A
- (10.3)	Controlgear providing SELV		N/A
	Accessible conductive parts are insulated from live parts by double or reinforced insulation in SELV controlgear		N/A
	No connection between output circuit and the body or protective earthing circuit		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		N/A
	SELV outputs separated from earth by at least basic insulation		N/A
	ELV conductive parts insulated as live parts		N/A
	Tests according Annex L of IEC 61347-1		N/A
- (10.4)	Accessible conductive parts in SELV circuits		N/A
	Output voltage under load ≤ 25 V r.m.s. or ≤ 60 V d.c.		N/A
	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		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

10 (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 (between input of LED module and lamp enclosure)	P
	For double or reinforced insulation ≥ 4 MΩ .....:		N/A
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		N/A

11 (12)	ELECTRIC STRENGTH		P
	Immediately after clause 11 electric strength test for 1 min		P
	Basic insulation for SELV, test voltage 500 V	Between input of LED module and lamp enclosure	P
	Working voltage ≤ 50 V, test voltage 500 V		N/A
	Working voltage > 50 V ≤ 1000 V, test voltage (V):		N/A
	Basic insulation, 2U + 1000 V		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	Supplementary insulation, 2U + 1000 V		N/A
	Double or reinforced insulation, 4U + 2000 V		N/A
	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

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		N/A
12.2	**Overpower condition**		**P**

IEC 60598-2-22_ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	Module withstands overpower condition >15 min.	SP2001DA-WH: Normal: 8.06 V x 0.1277 A = 1.029 W Overpower: 9 V x 0.1715 A = 1.544 W SP2003DA-WH: Normal: 8.19 V x 0.1085 A = 0.889 W Overpower: 9 V x 0.1482 A = 1.334 W SP2002DA-WH: Normal: 8.16 V x 0.1064 A = 0.869 W Overpower: 9 V x 0.1448 A = 1.304 W	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		N/A
14 (15)	**CONSTRUCTION**		**N/A**
- (15.1)	**Wood, cotton, silk, paper and similar fibrous material**		**N/A**
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		N/A
- (15.2)	**Printed circuits**		**N/A**
	Printed circuits used as internal connections complies with clause 14		N/A
15 (16)	**CREEPAGE DISTANCES AND CLEARANCES**		**P**
- (16.1)	**General**		**P**
	Creepage distances and clearances according to 16.2 and 16.3		P
	Controlgears providing SELV comply with additional requirements in Annex L		N/A
	Insulating lining of metallic enclosures		N/A
	Controlgear protected against pollution comply with 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 clause 11.2 on IEC 60598-1	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

IEC 60598-2-22_ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
- (16.3)	**Clearances**		**P**
- (16.3.2)	Clearances for working voltages		P
	Clearances distances according to Table 9	See clause 11.2 on IEC 60598-1	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		N/A
	Clearances distances for reinforced insulation according to Table 11		N/A
16 (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)		—
(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
(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
17 (18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		**P**

IEC 60598-2-22_ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	Refer to clause 22.16 (13) in IEC 60598-2-22		—
- (18.1)	Ball-pressure test .....:	See Test Table 22.16 (13.2.1)	P
- (18.3)	Glow-wire test (650°C) .....:	See Test Table 22.16 (13.3.2)	N/A
- (18.4)	Needle-flame test (10 s) .....:	See Test Table 22.16 (13.2.1)	P
- (18.5)	Proof tracking test .....:	See Test Table 22.16 (13.4)	P
18	**RESISTANCE TO CORROSION**		**N/A**
	Comply with requirements according 4.18 of IEC 60598-1		N/A
20	**HEAT MANAGEMENT**		**N/A**
20.1	**General**		**N/A**
	Fulfil clause 20 if replaceable LED module and when heat conducting thermal interface is needed.		N/A
20.2	**Thermal interface material**		**N/A**
	Thermal interface material delivered with the module if necessary		N/A
20.3	**Heat protection**		**N/A**
	Not impair safety when operated under poor heat-conduction conditions according Annex D		N/A
22	**PHOTOBIOLOGICAL SAFETY**		**P**
22.1	**UV radiation**		**N/A**
	Luminous radiation not exceed 2mW/klm		N/A
22.2	**Blue light hazard**		**P**
	Assessed according to IEC TR 62778	RG0	P
22.3	**Infrared radiation**		**N/A**
	Requirements for infrared radiation when required		N/A
A	**ANNEX A - TESTS**		**N/A**
	All tests performed in accordance with the advice given in Annex H of IEC 61347-1, if applicable		N/A

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

	Attachment 9: Photo-biological hazards according to IEC/TR 62778: 2014	**P**

7	**MEASUREMENT INFORMATION FLOW**		**P**
7.1	**Basic flow**		**P**
	Law of conservation of luminance' applied		P
	Use of only true luminance/radiance values		P
	In case of luminaire: The light source is operated in the luminaire under similar conditions as when tested as a component		P
	In case Ethr value for RG2 was established the peak value was derived from angular light distribution		N/A
7.2	**Conditions for the radiance measurement**		**P**
	Standard condition applied (200mm distance, 0,011rad field of view)		P
	Non-standard condition applied		N/A
7.3	**Special cases (I): Replacement by a lamp or LED module of another type**		**N/A**
	Light source is a white light source		N/A
	Evaluation done based on highest luminance		N/A
	Evaluation done based on CCT value		N/A
7.4	**Special cases (II): Arrays and clusters of primary light sources**		**N/A**
	LED package is evaluated as ..... :	☐ RG0 unlimited ☐ RG1 unlimited	N/A
	E_{thr} of LED package applies to array		N/A
8	**RISK GROUP CLASSIFICATION**		**P**
	Risk group achieved:		P
	- .. Risk Group 0 unlimited	RG0	P
	- .. Risk Group 1 unlimited		N/A
	- E_{thr} ..... (lx) : Distance to reach RG1 ..... (m) :		N/A

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

	TABLE: Spectro-radiometric measurement		**P**
	Measurement performed on:	☐ **LED package** ☐ **LED module** ☐ **Lamp** ☒ **Luminaire**	—
	Model number ..... :	SP2001DA-WH	—
	Test voltage (V) ..... :	240	—
	Test current (mA) ..... :	45	—
	Test frequency (Hz) ..... :	50	—
	Ambient, t (°C) ..... :	40	—
	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	Remark
Correlated colour temperature	CCT	—	—	—
x/y colour coordinates	—	—	—	—
Blue light hazard radiance	L_B	W/(m2•sr1)	2.115E-01	RG0
Blue light hazard irradiance	E_B	W/m2	—	—
Luminance	L	cd/m2	3.007E+02	—
Illuminance	E	lx	—	—
dmin	d	m	—	—
Supplementary information:				

	TABLE: Angular light distribution	**N/A**
Not apply for RG0 or RG1.		

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

	TABLE: Spectro-radiometric measurement		**P**
	Measurement performed on:	☐ **LED package** ☐ **LED module** ☐ **Lamp** ☒ **Luminaire**	—
	Model number ..... :	SP2003DA-WH	—
	Test voltage (V) ..... :	240	—
	Test current (mA) ..... :	44	—
	Test frequency (Hz) ..... :	50	—
	Ambient, t (°C) ..... :	40	—
	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	Remark
Correlated colour temperature	CCT	—	—	—
x/y colour coordinates	—	—	—	—
Blue light hazard radiance	L_B	W/(m2•sr1)	9.237E-02	RG0
Blue light hazard irradiance	E_B	W/m2	—	—
Luminance	L	cd/m2	1.343E+02	—
Illuminance	E	lx	—	—
dmin	d	m	—	—
Supplementary information:				

	TABLE: Angular light distribution	**N/A**
Not apply for RG0 or RG1.		

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

	TABLE: Spectro-radiometric measurement		P
	Measurement performed on:	☐ **LED package** ☐ **LED module** ☐ **Lamp** ☒ **Luminaire**	—
	Model number ..... :	SP2002DA-WH	—
	Test voltage (V) ..... :	240	—
	Test current (mA) ..... :	43	—
	Test frequency (Hz) ..... :	50	—
	Ambient, t (°C) ..... :	40	—
	Measurement distance ..... :	☒ 20 cm ☐ ... cm	—
	Source size ..... :	☒ Non-small ☐ Small: .... mm	—
	Field of view ..... :	☐ 100 mrad ☒ 11 mrad ☐ 1,7 mrad (for small sources)	—

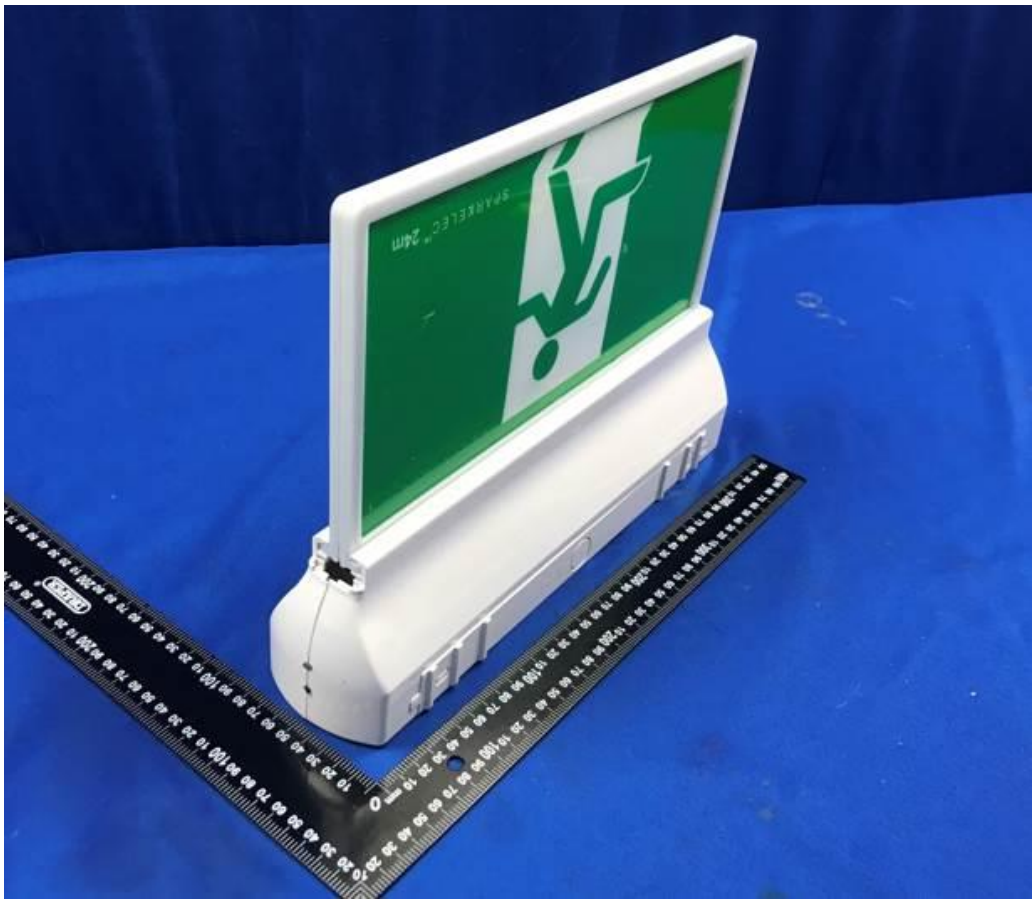
Item	Symbol	Units	Result	Remark
Correlated colour temperature	CCT	—	—	—
x/y colour coordinates	—	—	—	—
Blue light hazard radiance	L_B	W/(m2•sr1)	2.845E-01	RG0
Blue light hazard irradiance	E_B	W/m2	—	—
Luminance	L	cd/m2	3.396E+02	—
Illuminance	E	lx	—	—
dmin	d	m	—	—
Supplementary information:				

	TABLE: Angular light distribution	N/A
Not apply for RG0 or RG1.		

IEC 60598-2-22_ATTACHMENT

	Attachment 10: Pictures	**P**

Overall view of SP2003DA-WH and SP2003FE-WH



Overall view of SP2003DA-WH and SP2003FE-WH

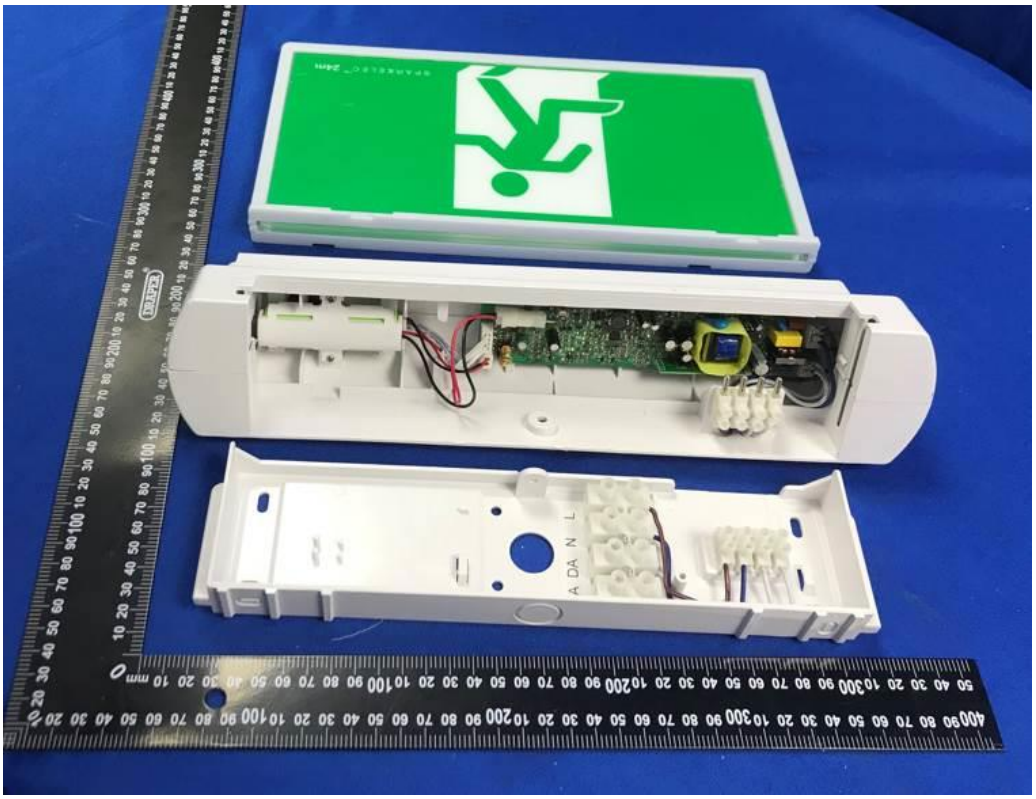
IEC 60598-2-22_ATTACHMENT

Indicator and test switch

Internal view of SP2003DA-WH and SP2003FE-WH

IEC 60598-2-22_ATTACHMENT

LED module of internal view of SP2003 series



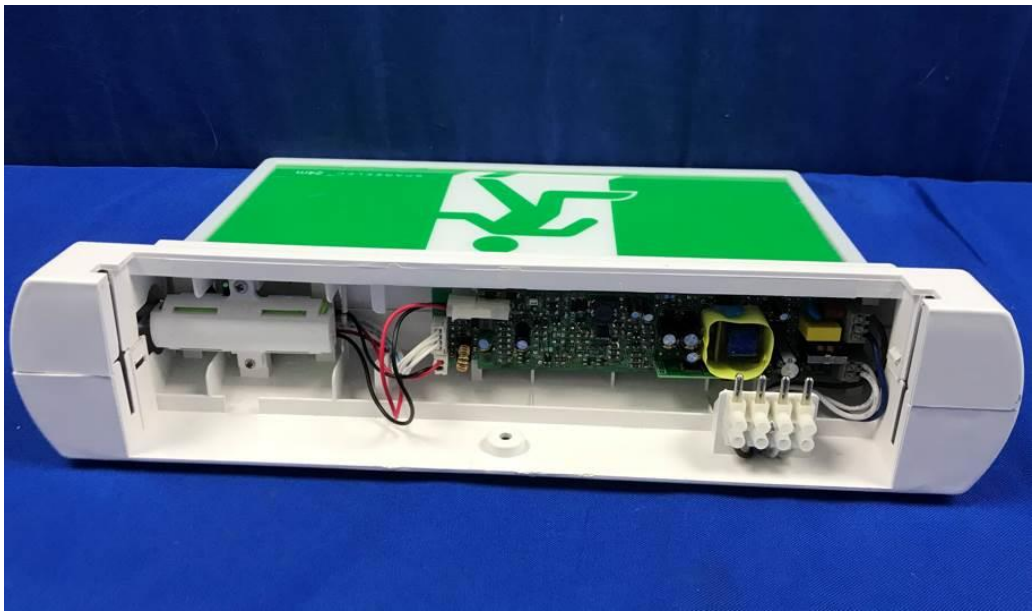
disassembly view of SP2003DA-WH

IEC 60598-2-22_ATTACHMENT

Input terminal block of SP2003DA-WH

AC Connector

IEC 60598-2-22_ATTACHMENT

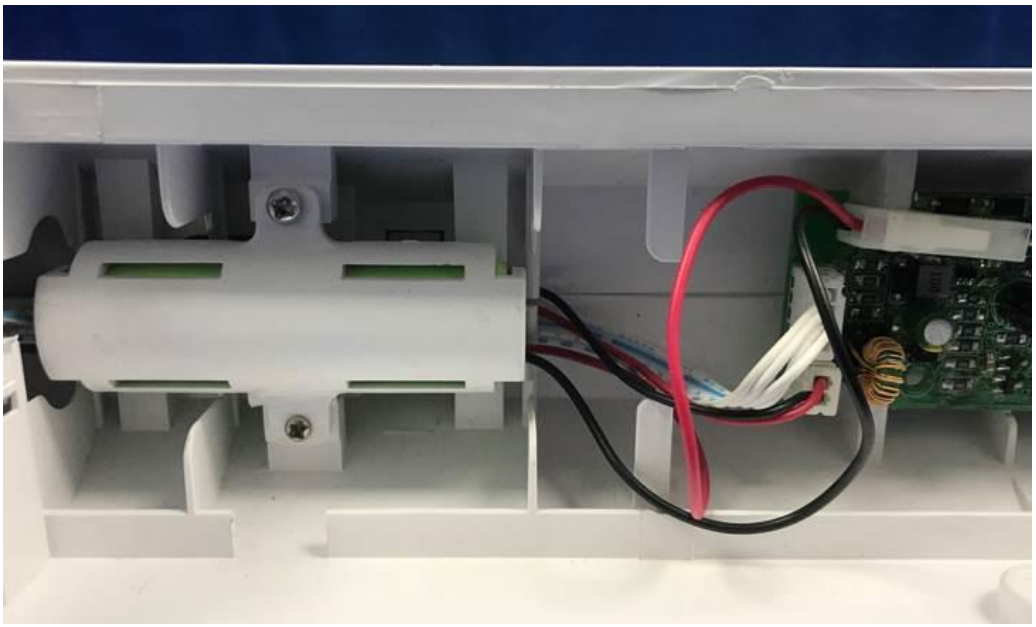


Internal view of SP2003DA-WH

Emergency controlgear

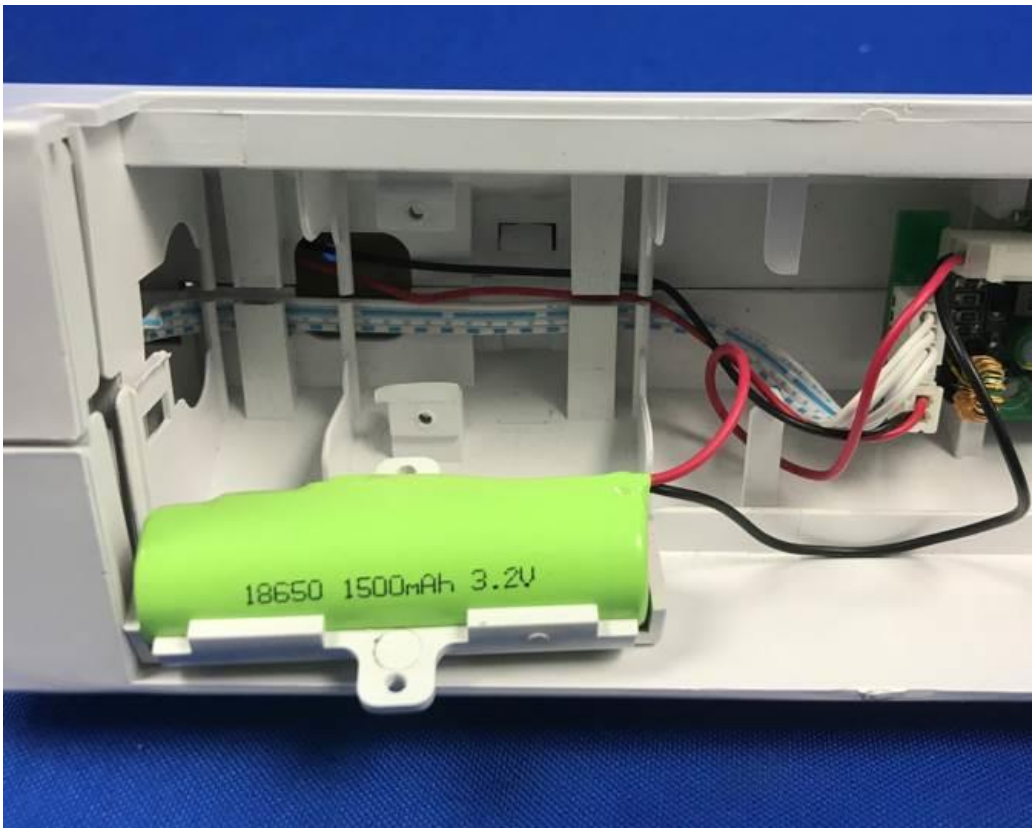
IEC 60598-2-22_ATTACHMENT

Internal wire (connected emergency controlgear and AC connector)



Battery

IEC 60598-2-22_ATTACHMENT

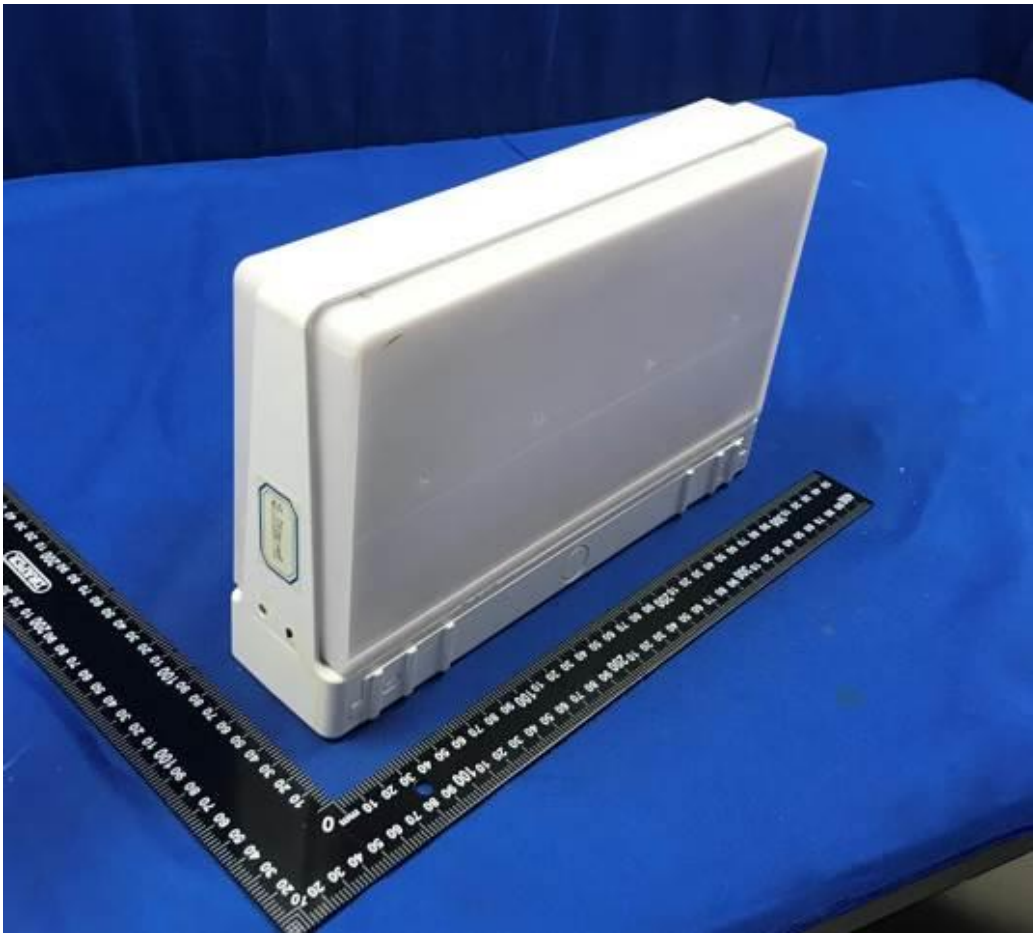


Overall view of battery

Overall view of SP2001DA-WH and SP2001FE-WH

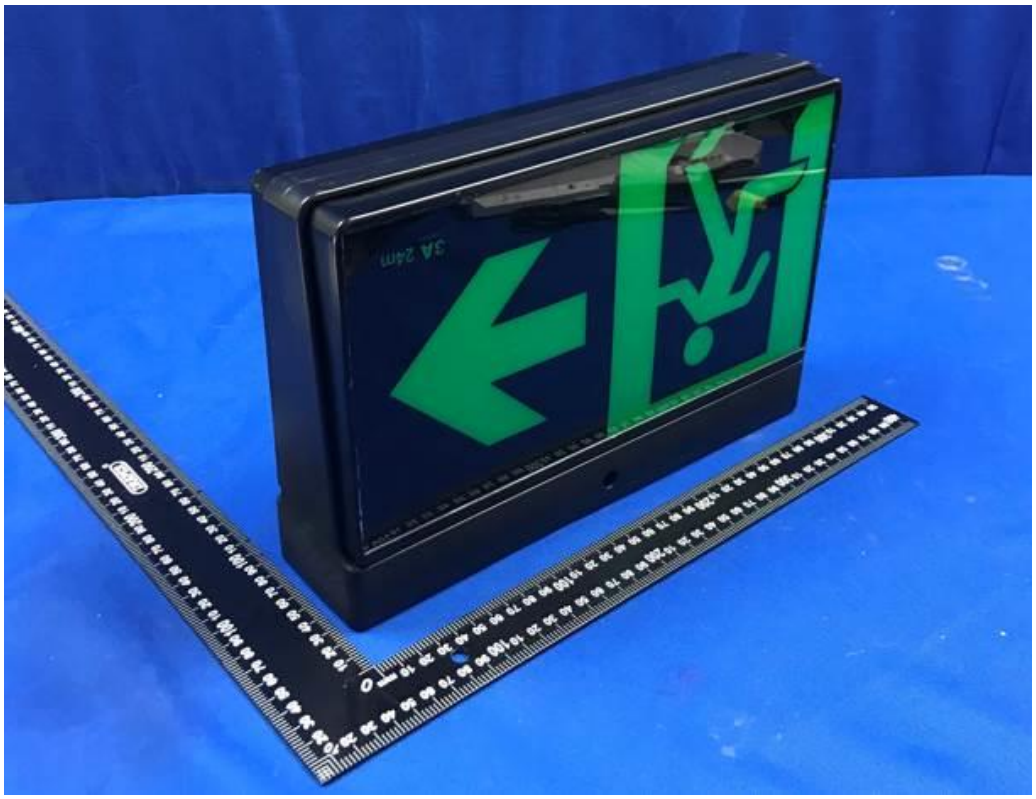
IEC 60598-2-22_ATTACHMENT

Overall view of SP2001DA-WH and SP2001FE-WH

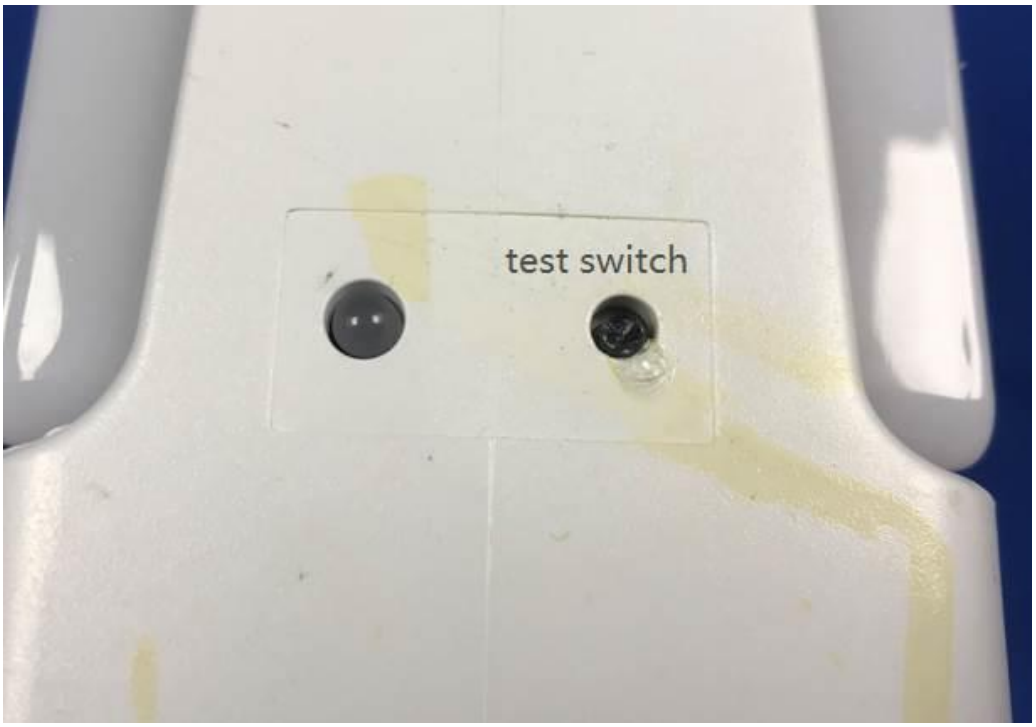


Overall view of SP2001DA-WH and SP2001FE-WH

IEC 60598-2-22_ATTACHMENT



Overall view of SP2001DA-BK and SP2001FE-BK



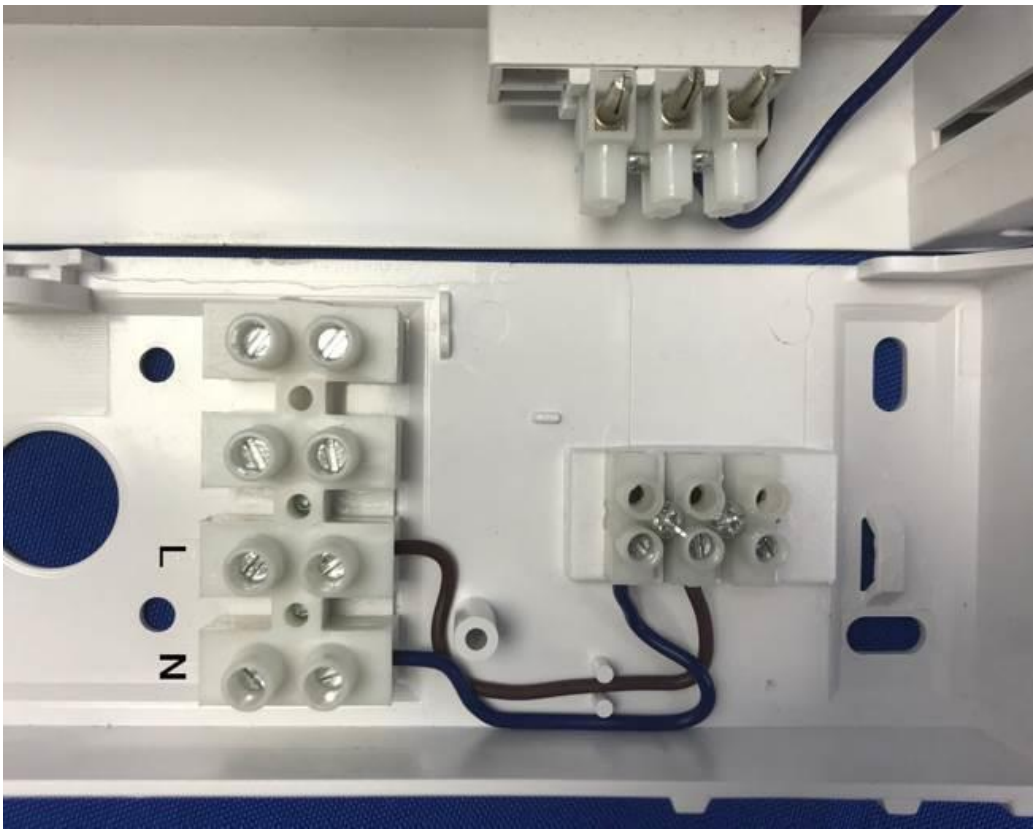
LED indicator and test switch

IEC 60598-2-22_ATTACHMENT

Internal view of SP2001DA-WH

Input terminal block and AC Connector for SPxxxxDA-ZZ series

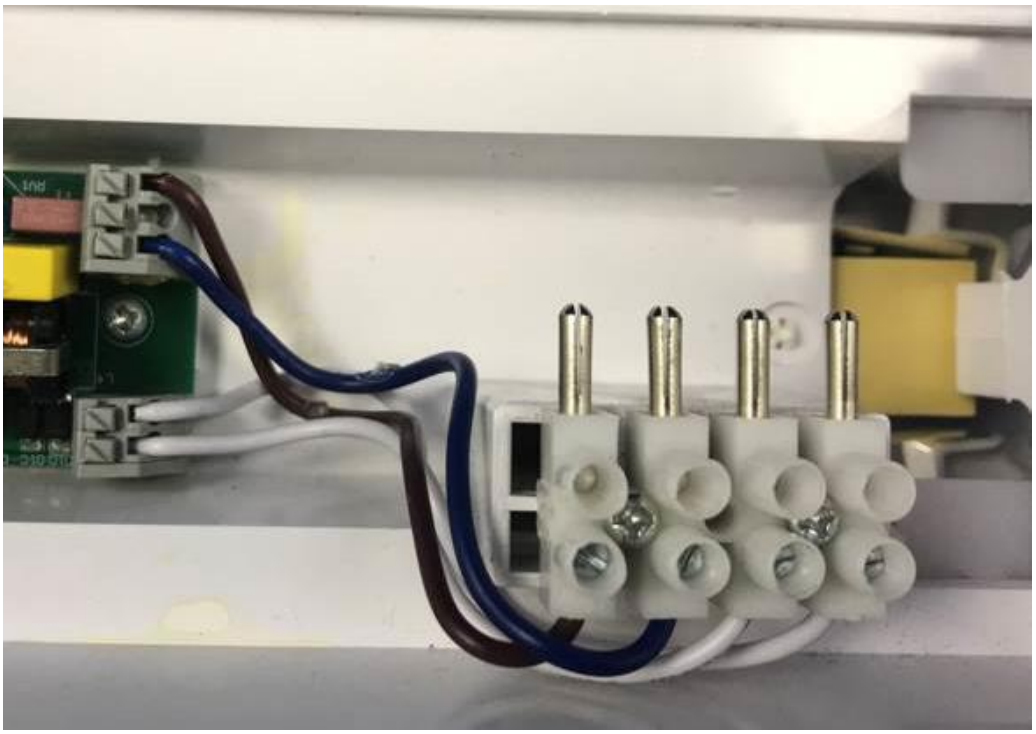
IEC 60598-2-22_ATTACHMENT



Input terminal block and AC Connector for SPxxxxFE-ZZ series

Internal view of SP2001DA-WH

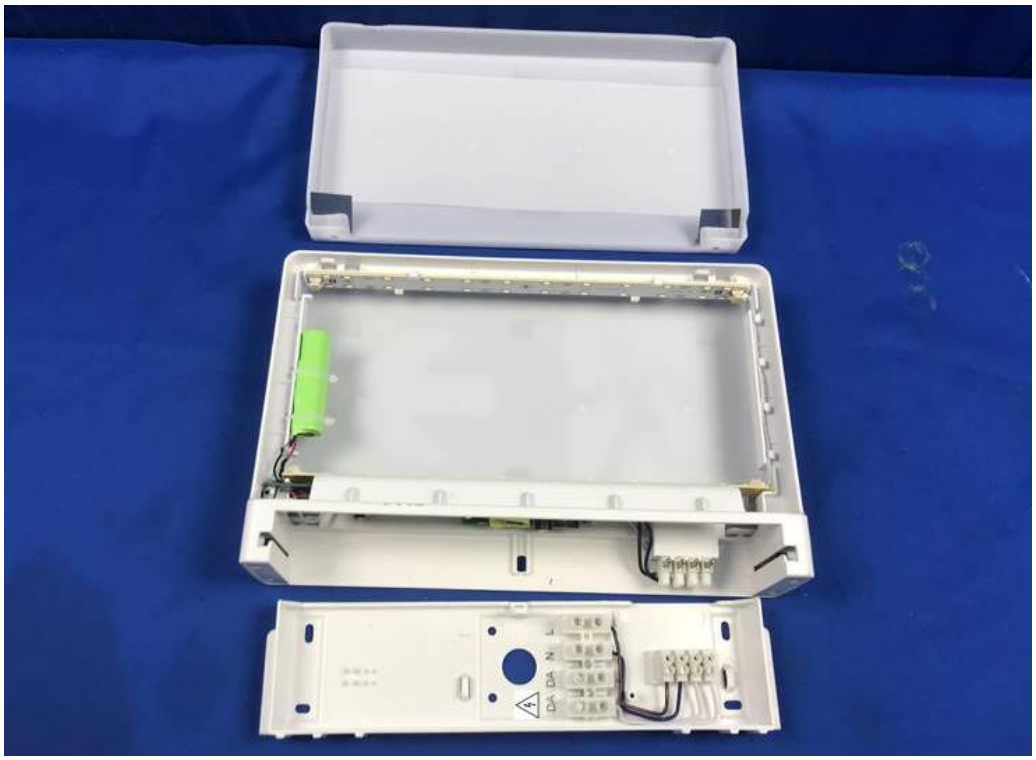
IEC 60598-2-22_ATTACHMENT



Internal wire connected emergency controlgear and AC connector

Emergency controlgear

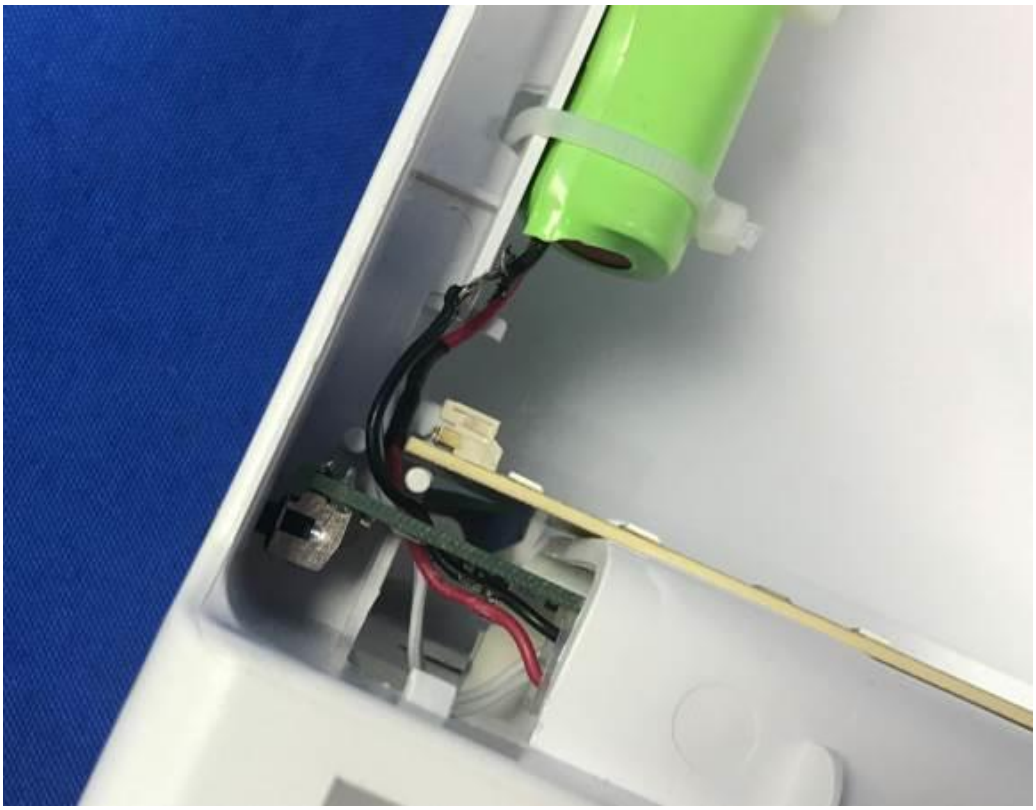
IEC 60598-2-22_ATTACHMENT



Internal view of SP2001DA-WH

Internal view of SP2001DA-WH

IEC 60598-2-22_ATTACHMENT



Internal wire

LED modules

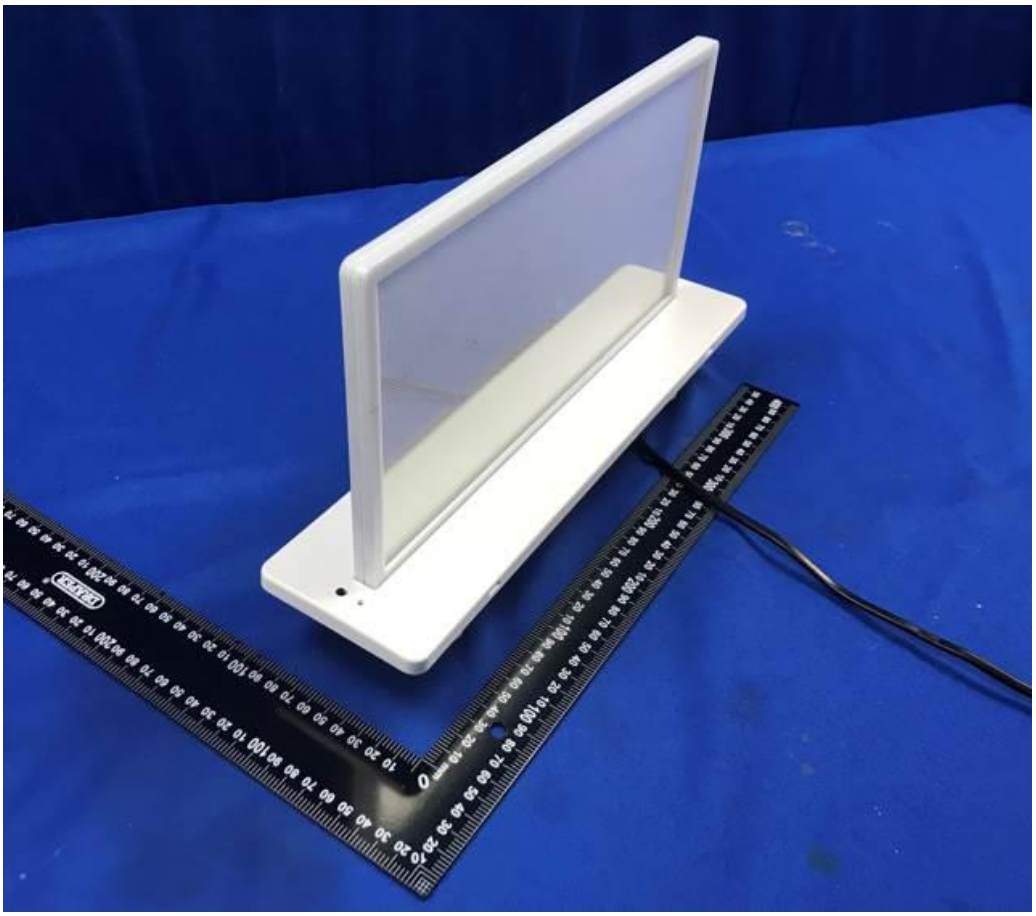
IEC 60598-2-22_ATTACHMENT

LED module

LED module (other one)

IEC 60598-2-22_ATTACHMENT

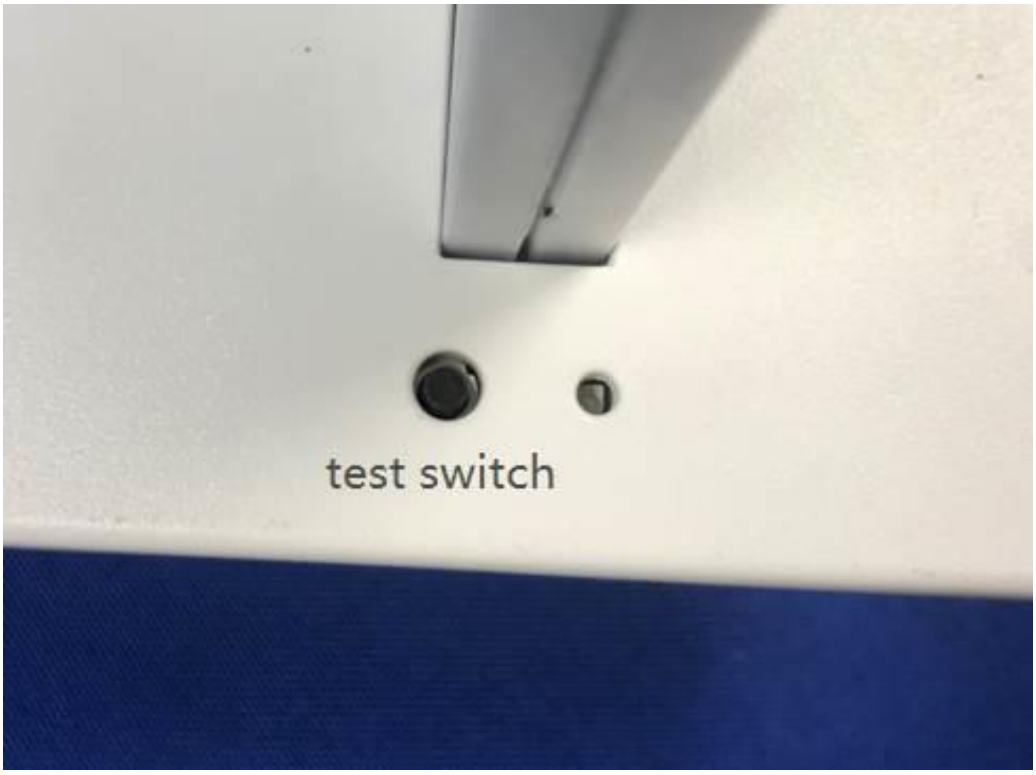
Overall view of SP2002DA-WH and SP2002FE-WH



Overall view of SP2002DA-WH and SP2002FE-WH

IEC 60598-2-22_ATTACHMENT

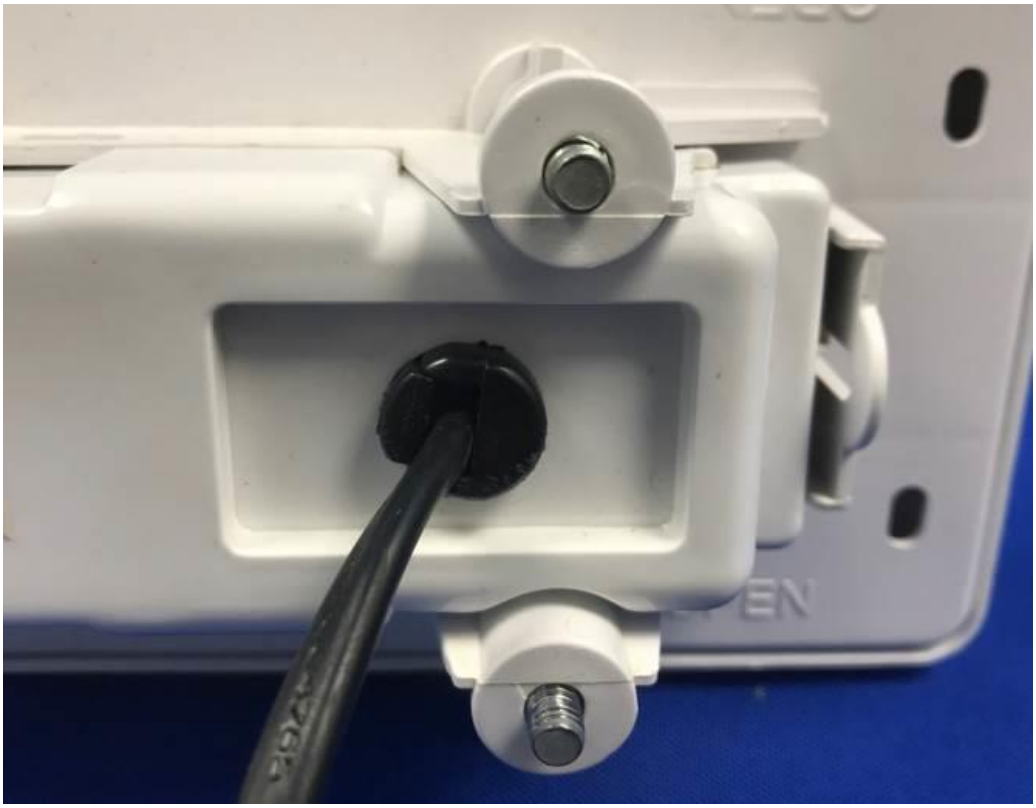
Overall view of SP2002DA-WH and SP2002FE-WH



Test switch and LED indicator

IEC 60598-2-22_ATTACHMENT

Mains plug



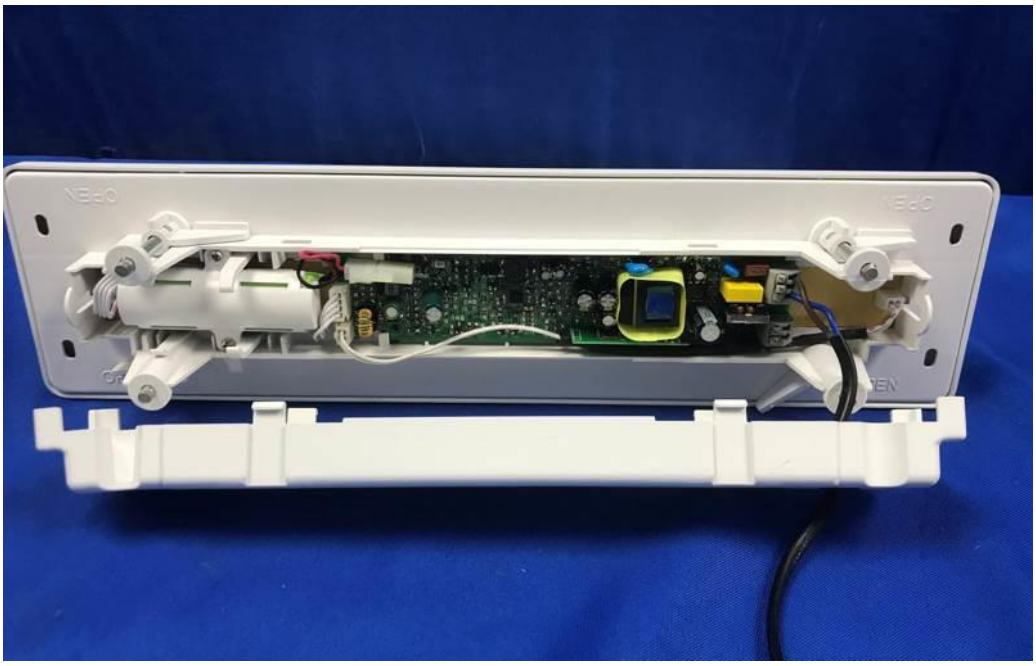
Cord entry and cord anchorage

IEC 60598-2-22_ATTACHMENT

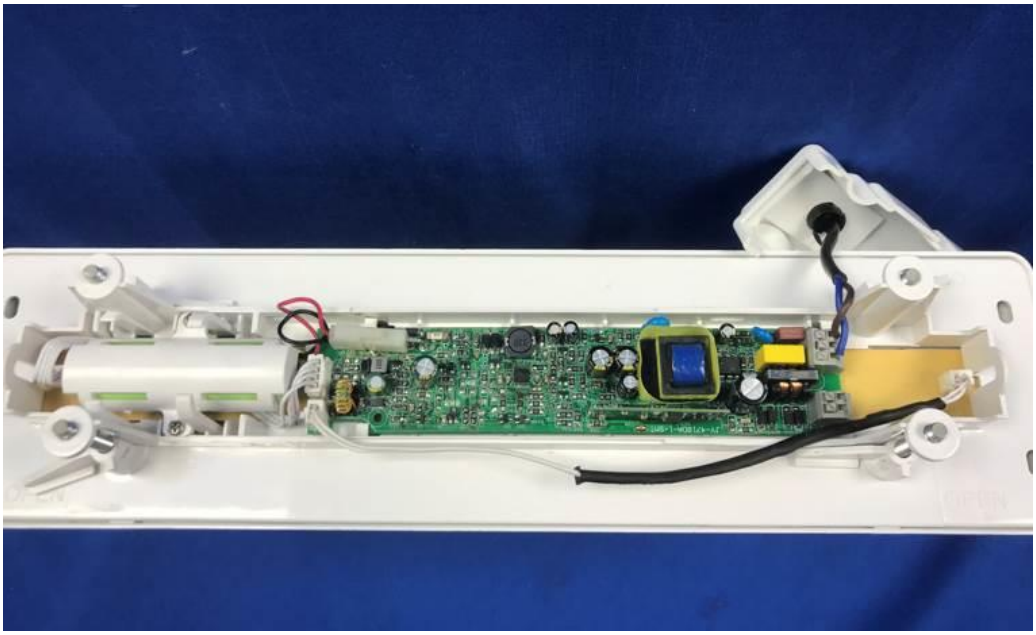
Internal view of cord entry and cord anchorage (fixed by glue)

Internal view of cord entry and cord anchorage (removed the glue)

IEC 60598-2-22_ATTACHMENT



Internal view of SP2002DA-WH and SP2002FE-WH



Emergency controlgear (heat-shrinkable tubing covering on input wire of LED module)

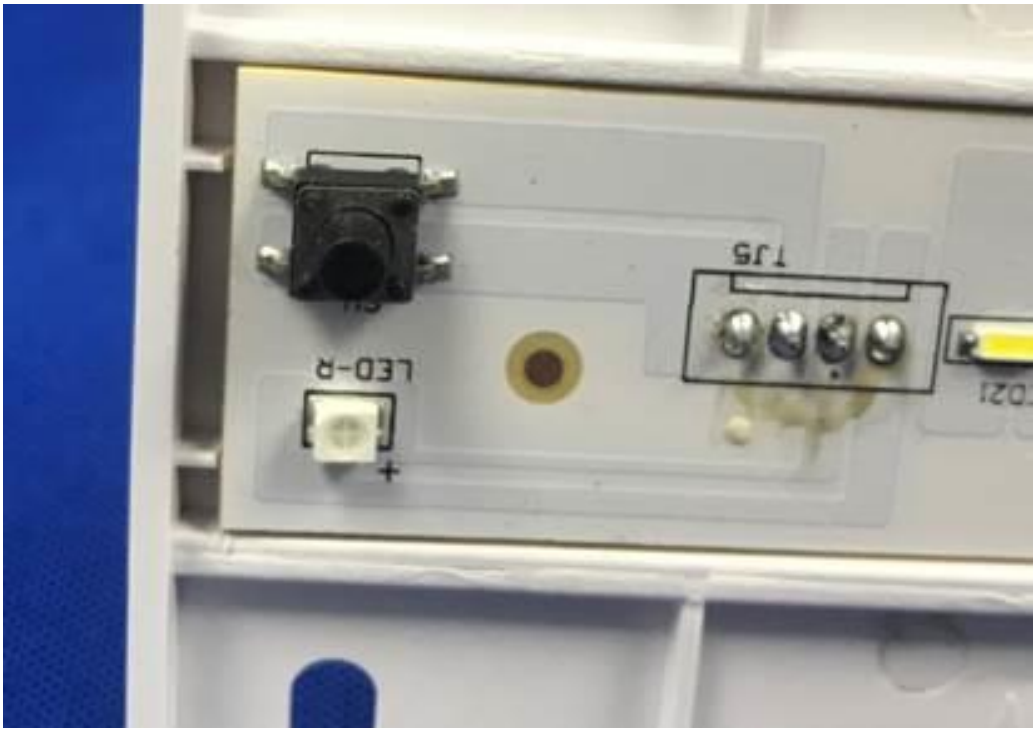
IEC 60598-2-22_ATTACHMENT

Battery

Disassembly view of LED module part

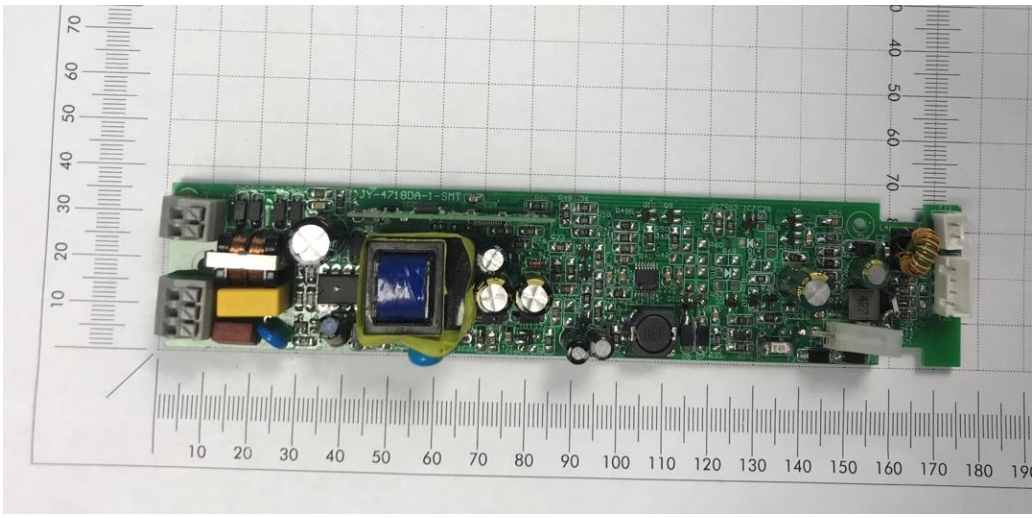
IEC 60598-2-22_ATTACHMENT

LED module for SP2002 series

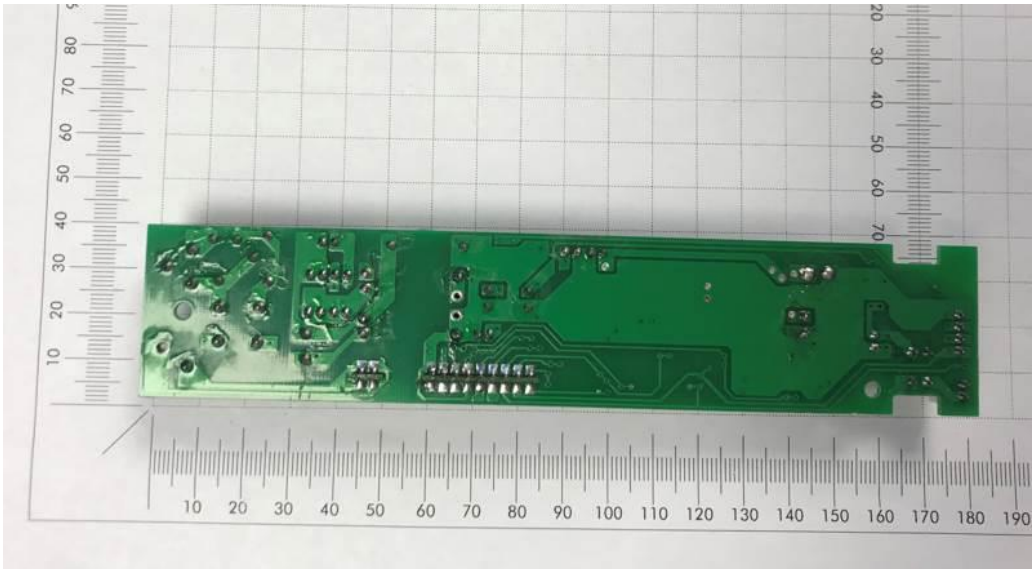


Test switch and LED indicator

IEC 60598-2-22_ATTACHMENT

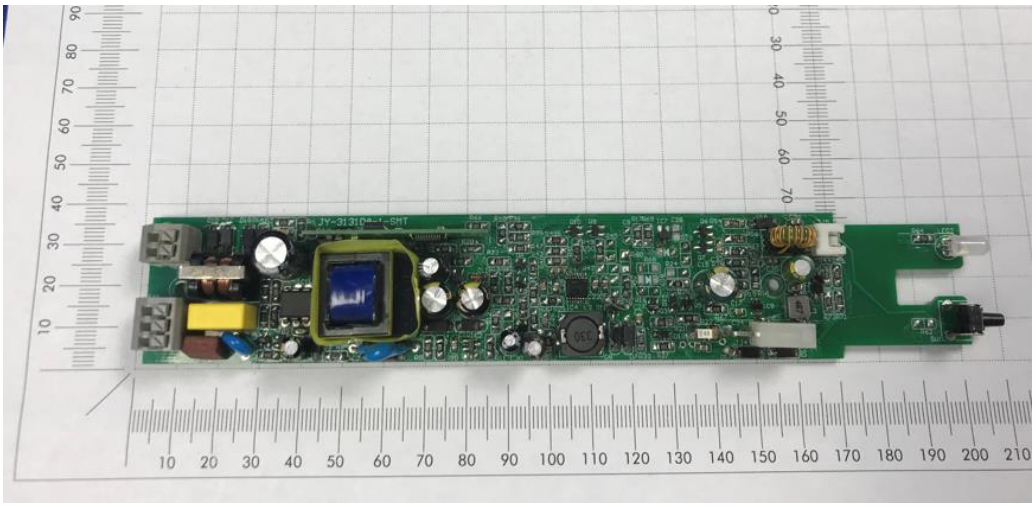


Components view of emergency controlgear for SP2002DA-zz and SP2003DA-zz

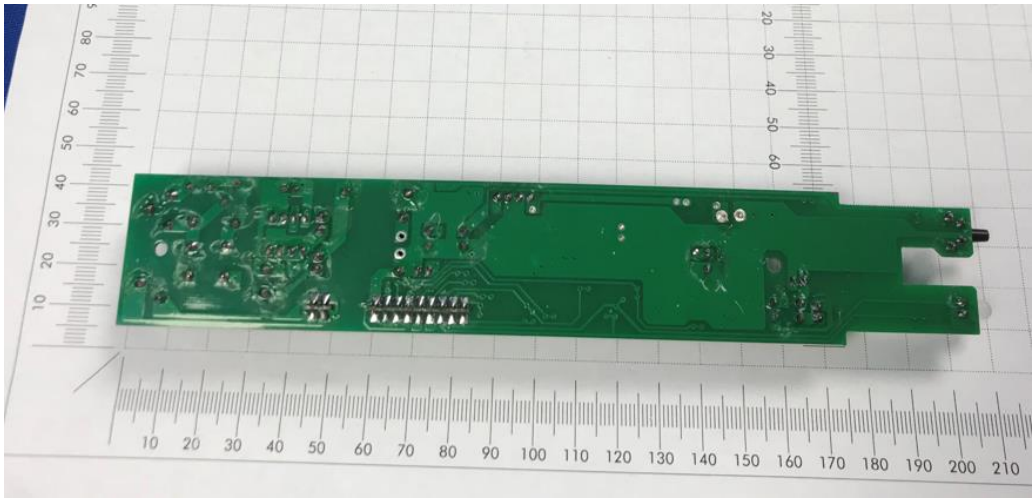


Solider side of emergency controlgear for SP2002DA-zz and SP2003DA-zz

IEC 60598-2-22_ATTACHMENT

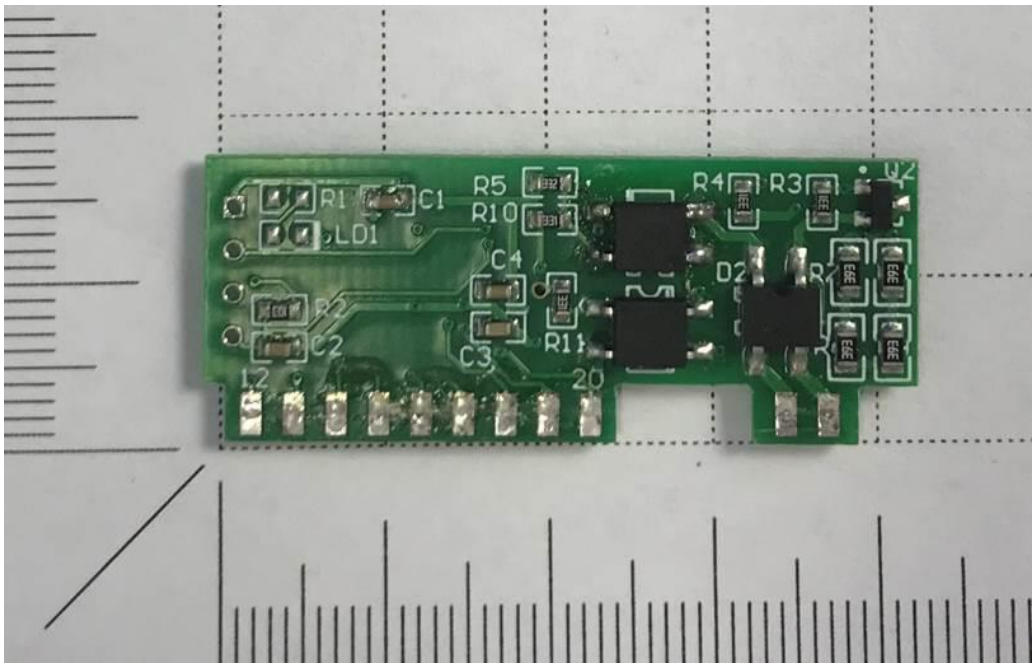


Components view of emergency controlgear for SP2001DA-zz

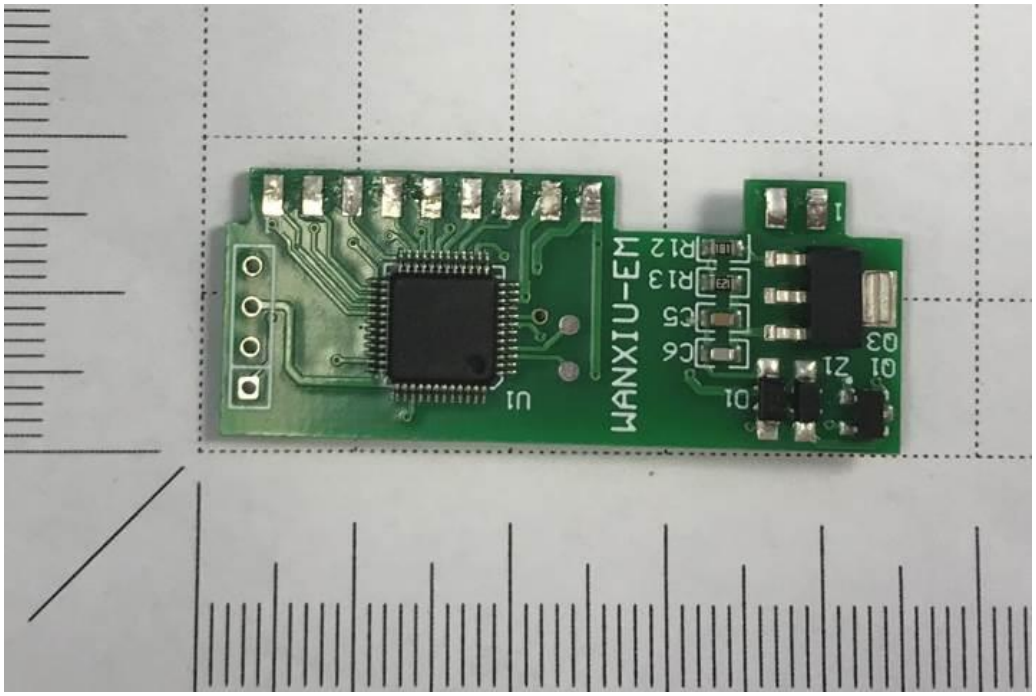


Solider side of emergency controlgear for SP2001DA-zz

IEC 60598-2-22_ATTACHMENT

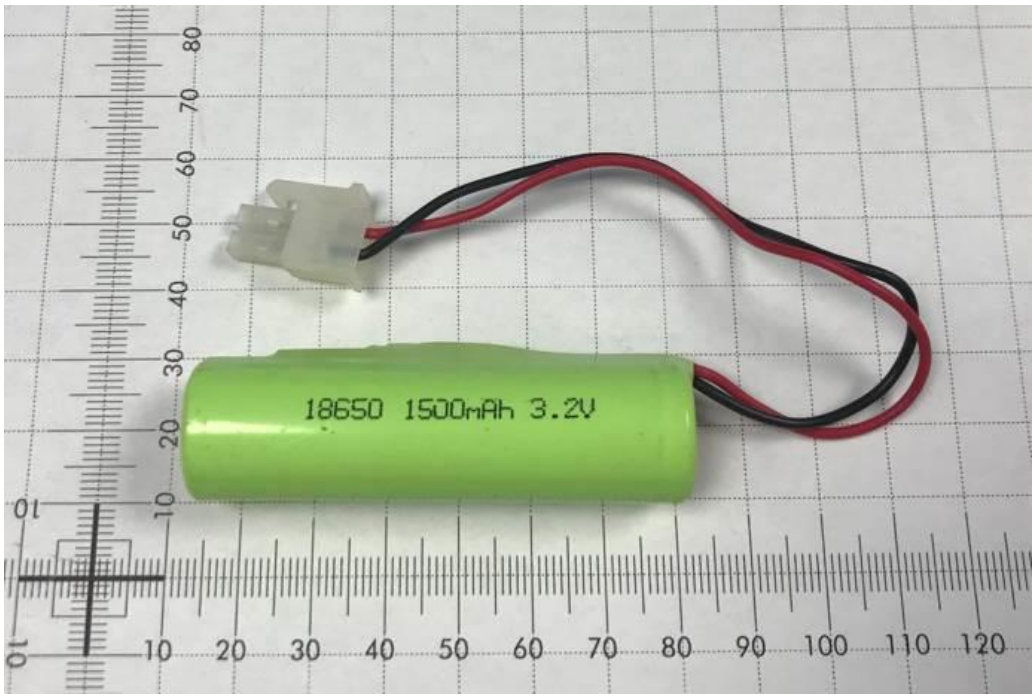


Subsidary circuit board



Subsidary circuit board

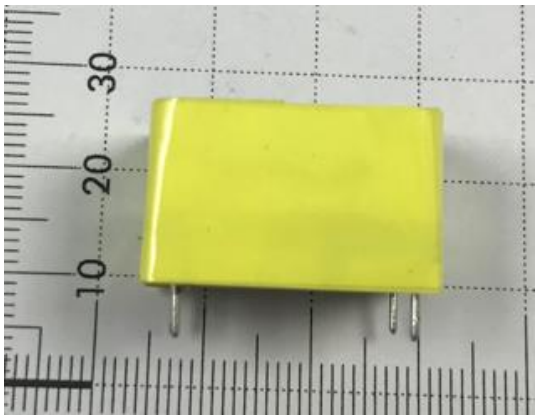
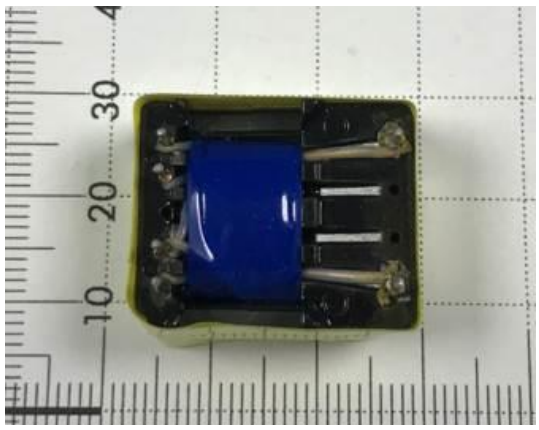
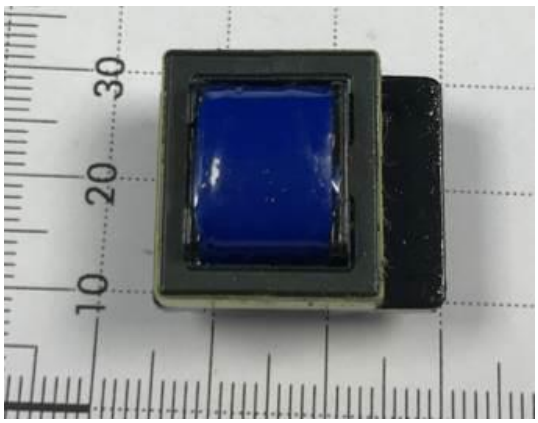
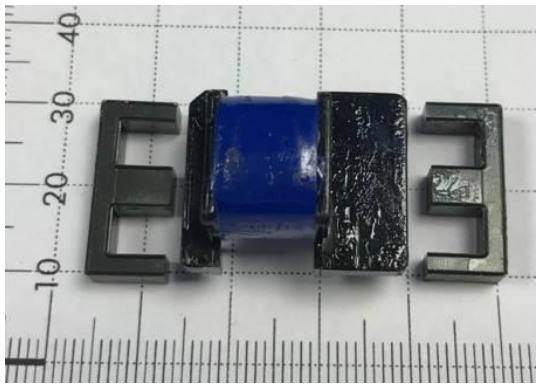
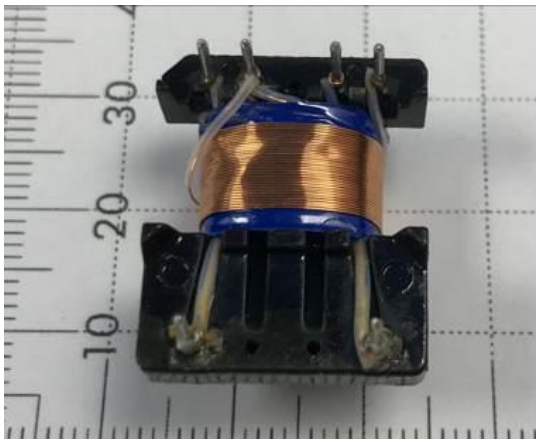
IEC 60598-2-22_ATTACHMENT



Overall view of battery for all models

Exit signs

IEC 60598-2-22_ATTACHMENT

Transformer	
 Overall view (the insulation tape wrapped the transformer at least three layers)	 Overall view
 Overall view	 Internal view
 Bobbin and core	 Primary winding with tubing

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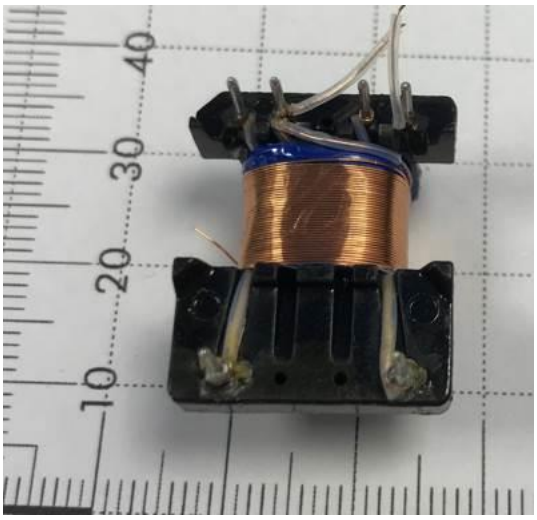
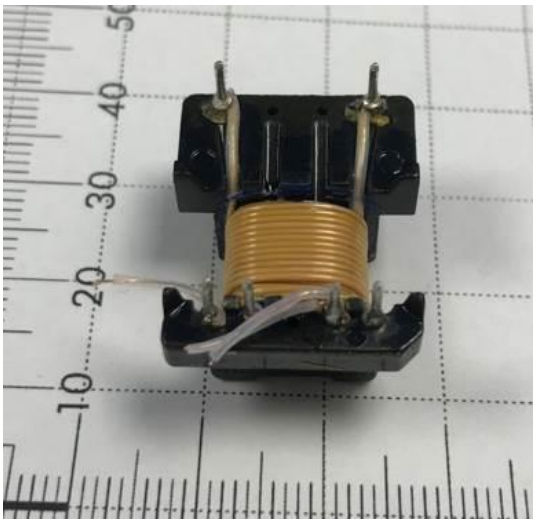
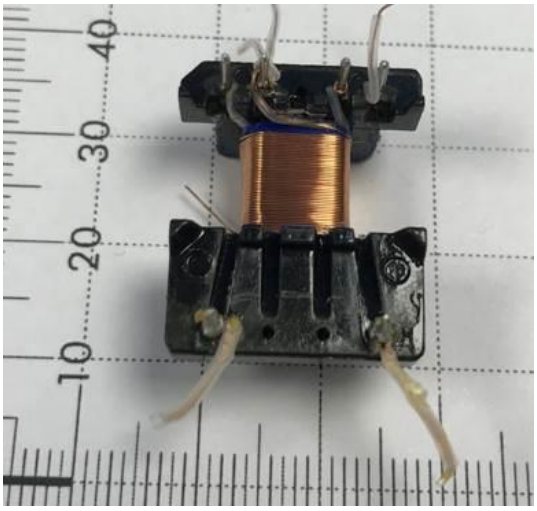


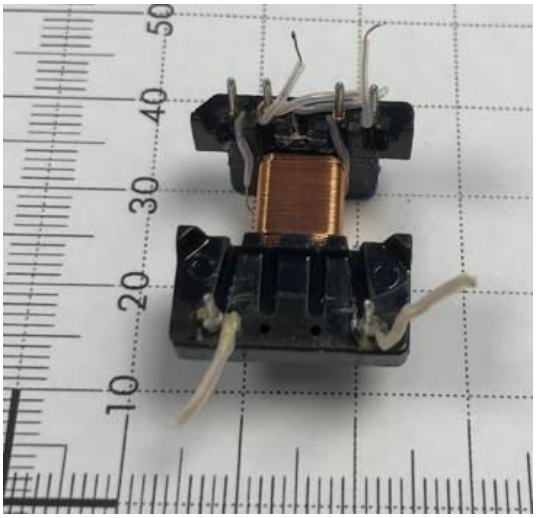
Primary winding with tubing



Secondary TIW winding with tubing



Primary winding with tubing



Primary winding with tubing

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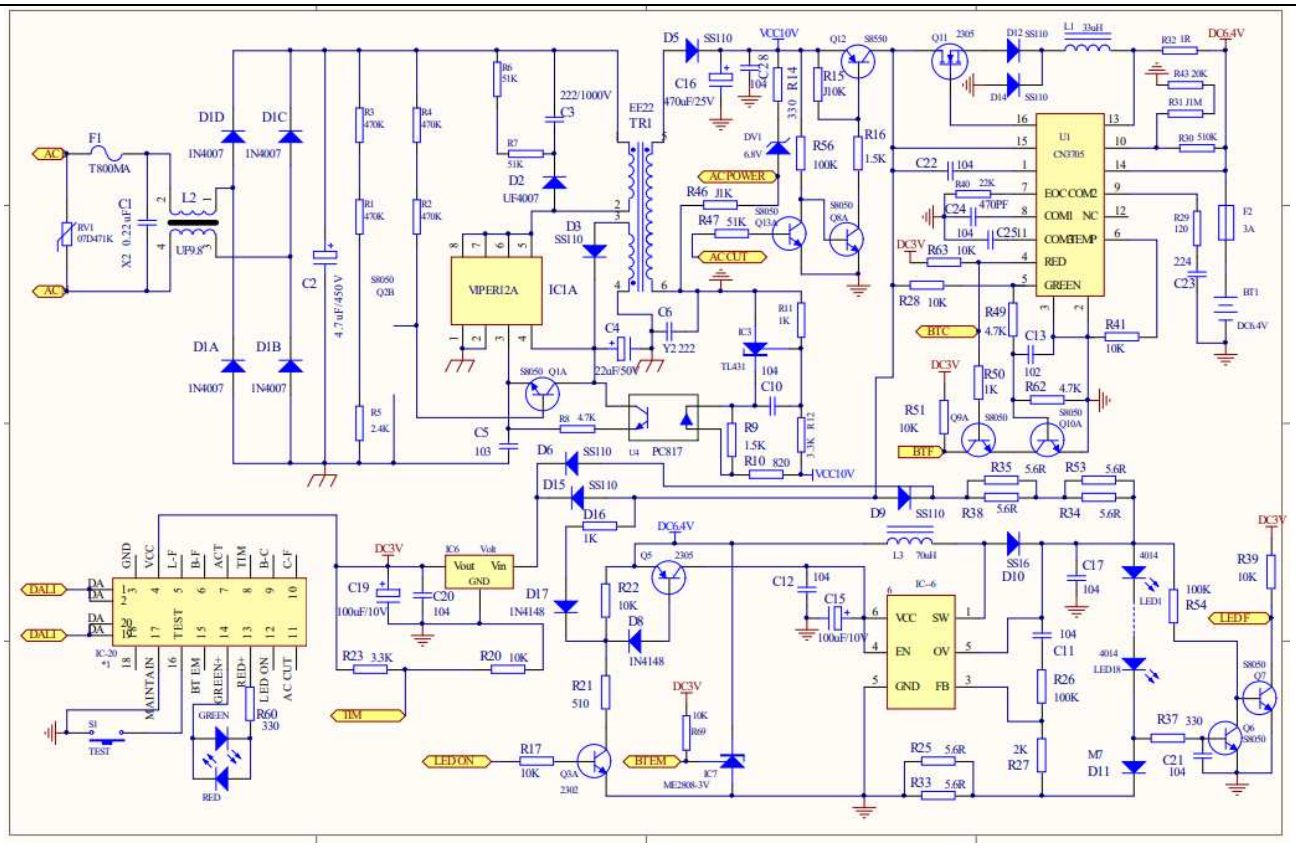
	Attachment 11: Circuit diagram and PCB layout	**P**



Circuit diagram of all models

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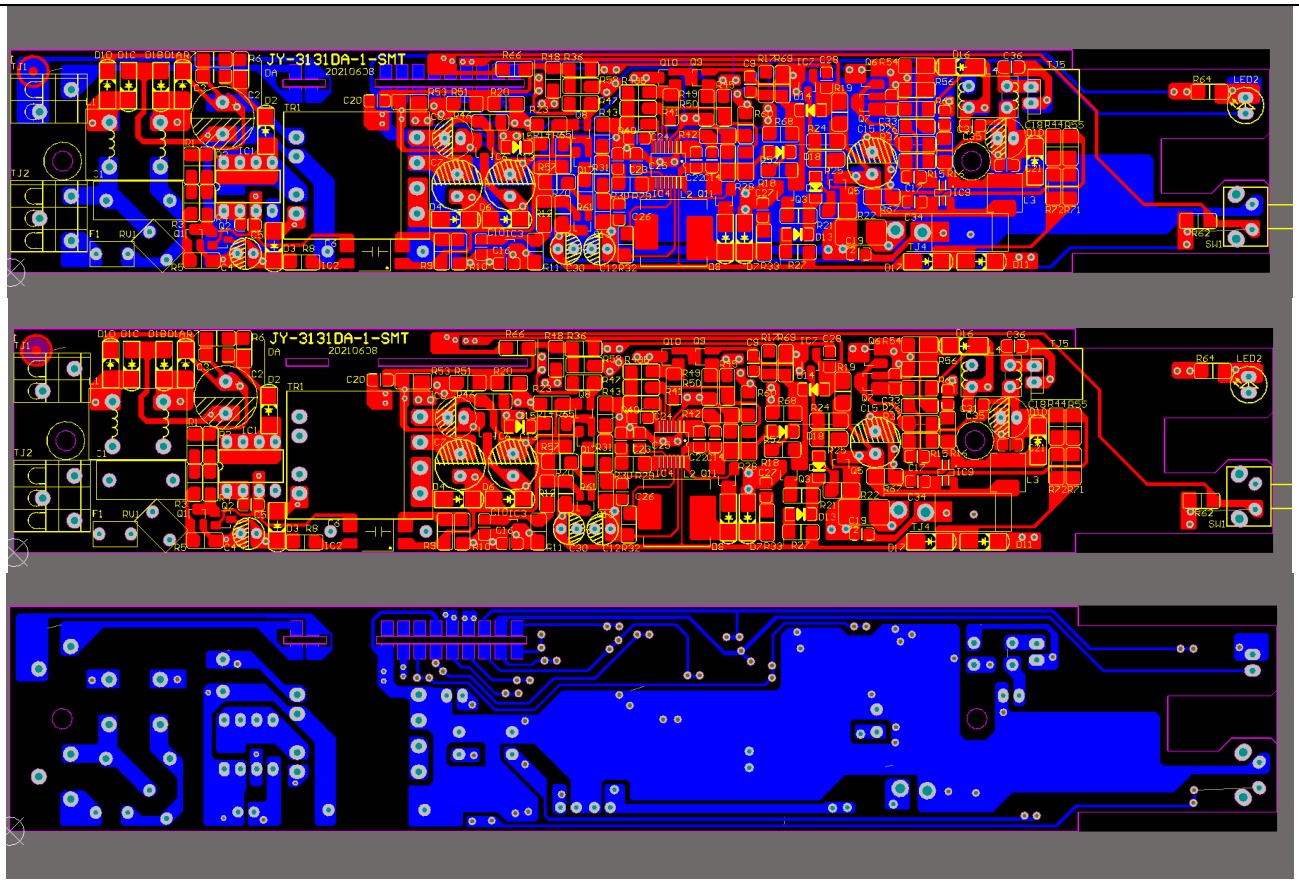

PCB layout of SP2001yy-zz

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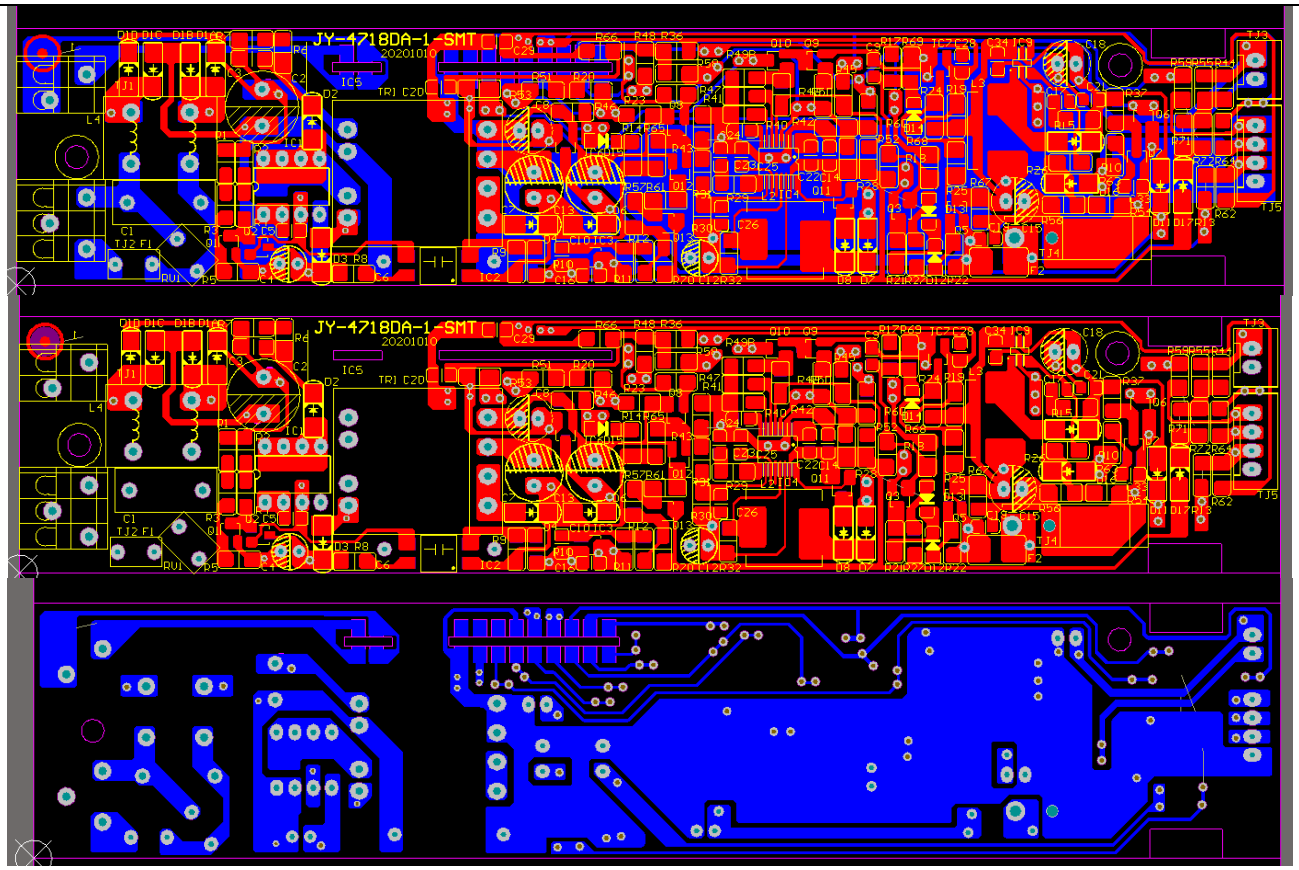

PCB layout of SP2002yy-zz and SP2003yy-zz

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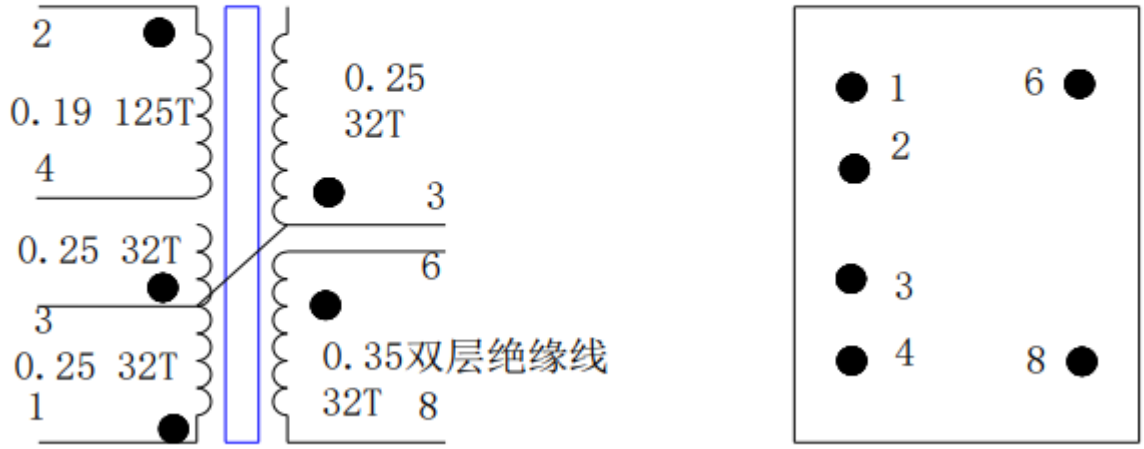
	Attachment 12: Transformer Specification	**P**

1.原理图：(针脚朝上)



2. 绕线方法：(针脚朝上,绕线方向：顺时钟方向)

绕线顺序	脚位	线径匝数	电感量
1	2-4	线头加套管Φ0.19 125T 多层密绕	0.9mh-1.0mH
2	绝缘胶带	黄色 2T	
3	3-空	线头加套管Φ0.25 32T 单层密绕	
4	绝缘胶带	黄色 2T	
5	6-8	Φ0.35 双层绝缘线 32T 单层密绕	

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6	绝缘胶带	蓝色 2T	
7	3-空	线头加套管Φ0.25 32T 单层密绕	
8	绝缘胶带	蓝色 2T	
9	1-3	线头加套管Φ0.25 32T 单层密绕	

3.备注：(骨架为 EE-19 卧式加宽型)

线圈胶带颜色：蓝色 磁芯胶带颜色：黄色

— End of the Report —