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

中国认可
国际互认
检测
TESTING
CNAS L10160

Report Number.....:	LCSB06174051S
Date of issue.....:	July 12, 2024
Total number of pages.....:	105 pages
Name of Testing Laboratory preparing the Report.....:	**Shenzhen Southern LCS Compliance Testing Co., Ltd.**
Applicant's name.....:	Foshan Rayven Lighting Co., Ltd.
Address.....:	A1 New Lighting Source Industry Zone, Luocun,Nanhai District, Foshan city, Guangdong province 528200, P.R. China
Test specification:	
Standard.....:	IEC 60598-2-1:1979 (First Edition) + A1:1987 used in conjunction with IEC 60598-1:2014+A1:2017
Test procedure.....:	Australia Safety
Non-standard test method.....:	N/A
Test Report Form No.....:	TRF-4-S-001 Ver. A/0
Test Report Form(s) Originator.....:	Intertek Semko AB
Master TRF.....:	2017-10

General disclaimer:

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

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Test item description.....:	LED Ceiling Light
Trade Mark.....:	Rayvenlights™
Manufacturer.....:	Same as the applicant
Address.....:	Same as the applicant
Model/Type reference.....:	See the model list on the page 5
Ratings.....:	See the model list on the page 5

☒	**Testing Laboratory:**	
Testing location/ address.....:	Shenzhen Southern LCS Compliance Testing Co., Ltd. Room 101-201, Building 39, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, Guangdong, China	
Tested by.....:	Yeoh Zhang (Engineer)	
Check by.....:	Torres He (Director)	
Approved by.....:	Jesse Liu (Manager)	

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

Attachment No. 1: Australian and New Zealand deviation of AS/NZS 60598.1:2017+A1:2017+A2:2020.
Attachment No. 2: Australian and New Zealand deviation of AS/NZS 60598.2.1:2014+A1:2016+A2:2019.
Attachment No. 3: Integral LED module of IEC 62031:2018
Attachment No. 4: Photobiological hazards of IEC TR 62778:2014.
Attachment No. 5: Integral LED driver of IEC 61347-2-13:2014+A1:2016.
Attachment No. 6: Australian and New Zealand deviation of AS/NZS 61347.1:2016+A1:2018+Rule1:2020.
Attachment No. 7: Australian and New Zealand deviation of AS 61347.2.13:2018.
Attachment No. 8: Photo documentation.

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
IEC 60598-2-1:1979+A1:1987 IEC 60598-1:2014+A1:2017 IEC 62031:2018 IEC TR 62778:2014 IEC 61347-2-13: 2014+A1:2016 IEC 61347-1: 2015+A1: 2017	Shenzhen Southern LCS Compliance Testing Ltd. Room 101-201, Building 39, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, Guangdong, China

Summary of compliance with National Differences:

List of countries addressed

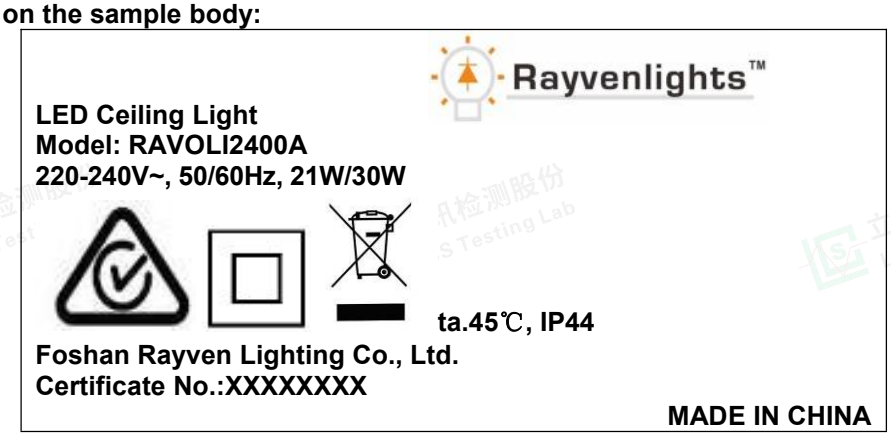
☒ The product fulfils the requirements of New Zealand and Australia differences.

AS/NZS 60598.2.1:2014+A1:2016+A2:2019; AS/NZS 60598.1:2017+A1:2017+A2:2020;
AS/NZS 61347.1:2016+A1:2018+Rule1:2020; AS 61347.2.13:2018

Copy of marking plate:

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

Label located on the sample body:



Remarks:

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

2. Representative markings of RAVOLI2400A, markings of all models are identical except for the model name and rating.

Test item particulars..... :	
Classification of installation and use.....:	Fixed general purpose luminaires
Supply Connection.....:	Terminal block
Protection Class.....:	Class II
Degree of Protection.....:	See the model list
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing..... :	
Date of receipt of test item.....:	2024-06-18
Date (s) of performance of tests.....:	2024-06-18 ~ 2024-07-10

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.
Clause numbers between brackets refer to clauses in IEC/EN 60598-1.
The general information of applicant and manufacturer (such as the name and address), product name, model/type reference, trademark and other similar information contained in this report are all provided by the applicant, the laboratory is not responsible for verifying its authenticity..

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

Modified Information

Version	Report No.	Revision Date	Summary
V1.0	LCSB06174051S	/	Original Version

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

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

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

Name and address of factory (ies)..... :	Same as the manufacture.

General product information:

1. All models are the similar construction except power, size and lens.
2. Unless otherwise specified, the main test model RAVOLI2400A was chosen as representative model to perform all test. Model RAVOLK1400A was tested in IP54. Model RAVOLI2400B was tested in difference tests.

Model list:
For all models:220-240V~, 50/60Hz, ta.45℃,
IP54 for RAVOLK series, IP44 for RAVOLI series

Model name	Power	Size(Φ*H, L*W*H)	Driver PCB
RAVOLK1250A	8W/13W	Φ250*60mm	Driver PCB 1
RAVOLK1250A-1	8W/13W	250*250*60mm	
RAVOLK1300A	17W/21W	Φ300*60mm	
RAVOLK1300A-1	17W/21W	300*300*60mm	
RAVOLK1400A	21W/30W	Φ400*61mm	
RAVOLK1400A-1	21W/30W	400*400*61mm	
RAVOLK1400A-2	21W/30W	400*400*65mm	
RAVOLI2250A	8W/13W	Φ250*55mm	
RAVOLI2300A	17W/21W	Φ300*55mm	
RAVOLI2400A	21W/30W	Φ400*56mm	
RAVOLK1250I	8.5W / 10W	Φ250*60mm	
RAVOLK1250I-1	8.5W / 10W	250*250*60mm	
RAVOLK2250I	13W / 18W	Φ250*60mm	
RAVOLK2250I-1	13W / 18W	250*250*60mm	
RAVOLK2250A	13W / 18W	Φ250*65mm	
RAVOLK2250A-1	13W / 18W	250*250*65mm	
RAVOLK1300I	10W / 15W	Φ300*60mm	
RAVOLK1300I-1	10W / 15W	300*300*60mm	
RAVOLK2300I	17W/21W	Φ300*65mm	
RAVOLK2300I-1	17W/21W	300*300*65mm	
RAVOLK1400I	16.5W / 23W	Φ400*61mm	
RAVOLI2250I	8.5W / 10W	Φ250*55mm	
RAVOLI2300I	10W / 15W	Φ300*55mm	
RAVOLI2400I	16.5W / 23W	Φ400*56mm	
RAVOLK1250B	8W/13W	Φ250*60mm	Driver PCB 2
RAVOLK1250B-1	8W/13W	250*250*60mm	
RAVOLK1300B	17W/21W	Φ300*60mm	
RAVOLK1300B-1	17W/21W	300*300*60mm	
RAVOLK1400B	21W/30W	Φ400*61mm	

RAVOLK1400B-1	21W/30W	400*400*61mm	
RAVOLK1400B-2	21W/30W	400*400*65mm	
RAVOLI2250B	8W/13W	Φ250*55mm	
RAVOLI2300B	17W/21W	Φ300*55mm	
RAVOLI2400B	21W/30W	Φ400*56mm	
RAVOLK1250J	8.5W / 10W	Φ250*60mm	
RAVOLK1250J-1	8.5W / 10W	250*250*60mm	
RAVOLK2250J	13W / 18W	Φ250*60mm	
RAVOLK2250J-1	13W / 18W	250*250*60mm	
RAVOLK2250B	13W / 18W	Φ250*65mm	
RAVOLK2250B-1	13W / 18W	250*250*65mm	
RAVOLK1300J	10W / 15W	Φ300*60mm	
RAVOLK1300J-1	10W / 15W	300*300*60mm	
RAVOLK2300J	17W/21W	Φ300*65mm	
RAVOLK2300J-1	17W/21W	300*300*65mm	
RAVOLK1400J	16.5W / 23W	Φ400*61mm	
RAVOLI2250J	8.5W / 10W	Φ250*55mm	
RAVOLI2300J	10W / 15W	Φ300*55mm	
RAVOLI2400J	16.5W / 23W	Φ400*56mm	

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.2 (0)	**GENERAL TEST REQUIREMENTS**		P
1.2 (0.1)	Information for luminaire design considered..... :	Standard Yes☒ No☐	—
1.2 (0.3)	More sections applicable.....:	Yes☐ No☒	—
1.2 (0.5)	Components	(see Annex 1)	—
1.2 (0.7)	Information for luminaire design in light sources standards		—
1.2 (0.7.2)	Light source safety standard ..... :	IEC 62031, IEC/TR 62778	—
	Luminaire design in the light source safety standard		P
1.4 (2)	**CLASSIFICATION**		P
1.4 (2.2)	Type of protection .....:	Class II	—
1.4 (2.3)	Degree of protection.....:	IP54/IP44	—
1.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces..... :	Yes☒ No☐	—
1.4 (2.5)	Luminaire for normal use ..... :	Yes☒ No☐	—
	Luminaire for rough service ..... :	Yes☐ No☒	—
1.5 (3)	**MARKING**		P
1.5 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
1.5 (3.3)	Additional information		P
	Language of instructions	English	P
1.5 (3.3.1)	Combination luminaires		N/A
1.5 (3.3.2)	Nominal frequency in Hz	50/60Hz	P
1.5 (3.3.3)	Operating temperature		N/A
1.5 (3.3.4)	Symbol or warning notice		N/A
1.5 (3.3.5)	Wiring diagram		N/A
1.5 (3.3.6)	Special conditions		N/A
1.5 (3.3.7)	Metal halide lamp luminaire – warning		N/A
1.5 (3.3.8)	Limitation for semi-luminaires		N/A
1.5 (3.3.9)	Power factor and supply current		P
1.5 (3.3.10)	Suitability for use indoors		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.5 (3.3.11)	Luminaires with remote control		N/A
1.5 (3.3.12)	Clip-mounted luminaire – warning		N/A
1.5 (3.3.13)	Specifications of protective shields		N/A
1.5 (3.3.14)	Symbol for nature of supply	~	P
1.5 (3.3.15)	Rated current of socket outlet		N/A
1.5 (3.3.16)	Rough service luminaire		N/A
1.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments		N/A
1.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A
1.5 (3.3.19)	Protective conductor current in instruction if applicable		N/A
1.5 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
1.5 (3.3.21)	Non-replaceable and non-user replaceable light sources information provided	Non replaceable	P
	Cautionary symbol		N/A
1.5 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
1.5 (3.3.23)	Luminaire without controlgear provided with necessary information for selection of appropriate component		N/A
1.5 (3.3.24)	If not supplied with terminal block, information on the packaging		P
1.5 (3.4)	Test with water	15s	P
	Test with hexane	15s	P
	Legible after test	Labels still be legible	P
	Label attached	Marking labels not be easily removable and no curling	P
1.6 (4)	**CONSTRUCTION**		P
1.6 (4.2)	Components replaceable without difficulty		N/A
1.6 (4.3)	Wireways smooth and free from sharp edges		P
1.6 (4.4)	**Lampholders**		N/A
1.6 (4.4.1)	Integral lampholder		N/A
1.6 (4.4.2)	Wiring connection		N/A
1.6 (4.4.3)	Lampholder for end-to-end mounting		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.4.4)	Positioning		N/A
	- pressure test (N) ..... :	--	—
	After test the lampholder comply with relevant standard sheets and show no damage		N/A
	After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation		N/A
	- bending test (N) .....:	--	—
	After test the lampholder have not moved from its position and show no permanent deformation		N/A
1.6 (4.4.5)	Peak pulse voltage		N/A
1.6 (4.4.6)	Centre contact		N/A
1.6 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A
1.6 (4.4.8)	Lamp connectors		N/A
1.6 (4.4.9)	Caps and bases correctly used		N/A
1.6 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N/A
1.6 (4.5)	**Starter holders**		N/A
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
1.6 (4.6)	**Terminal blocks**		**N/A**
	Tails		N/A
	Unsecured blocks		N/A
1.6 (4.7)	**Terminals and supply connections**		**P**
1.6 (4.7.1)	Contact to metal parts		N/A
1.6 (4.7.2)	Test 8 mm live conductor		P
	Test 8 mm earth conductor		N/A
1.6 (4.7.3)	Terminals for supply conductors		P
1.6 (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 15.8.2		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- electrical test according to 15.9		N/A
	- heat test according to 15.9.2.3 and 15.9.2.4		N/A
1.6 (4.7.4)	Terminals other than supply connection		N/A
1.6 (4.7.5)	Heat-resistant wiring/sleeves		N/A
1.6 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A
1.6 (4.8)	**Switches**		**P**
	- adequate rating		P
	- adequate fixing		P
	- polarized supply		N/A
	- compliance with IEC 61058-1 for electronic switches	For 10,000 operating cycles	P
1.6 (4.9)	**Insulating lining and sleeves**		N/A
1.6 (4.9.1)	Retainment		N/A
	Method of fixing.....:	--	—
1.6 (4.9.2)	Insulated linings and sleeves:		N/A
	Resistant to a temperature > 20 °C to the wire temperature or		N/A
	a) & c) Insulation resistance and electric strength		N/A
	b) Ageing test. Temperature (°C).....:	--	N/A
1.6 (4.10)	**Double or reinforced insulation**		P
1.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		P
	Safe installation fixed luminaires		P
	Capacitors and switches		N/A
	Interference suppression capacitors according to IEC 60384-14		N/A
1.6 (4.10.2)	Assembly gaps:		N/A
	- not coincidental		N/A
	- no straight access with test probe		N/A
1.6 (4.10.3)	Retainment of insulation:		P
	- fixed		P
	- unable to be replaced; luminaire inoperative		P
	- sleeves retained in position		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- lining in lampholder		N/A
4.7 (4.10.4)	Protective impedance device		N/A
	Basic and supplementary insulation bridged by resistor(s) or appropriate capacitor		N/A
	Double or reinforced insulation bridged by at least two separate resistors in series or appropriate capacitor(s)		N/A
	Capacitors comply with IEC 60384-14		N/A
	Resistors comply with test (a) in 14.2 of IEC 60065		N/A
1.6 (4.11)	**Electrical connections and current-carrying parts**		**P**
1.6 (4.11.1)	Contact pressure		P
1.6 (4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread- cutting screws		N/A
1.6 (4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
1.6 (4.11.4)	Material of current-carrying parts		P
1.6 (4.11.5)	No contact to wood or mounting surface		P
1.6 (4.11.6)	Electro-mechanical contact systems		N/A
1.6 (4.12)	**Screws and connections (mechanical) and glands**		**P**
1.6 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N/A
	Torque test: torque (Nm); part.....:	Fixed enclosure:0.5Nm	P
	Torque test: torque (Nm); part.....:	Fixed LED driver:0.5Nm	P
	Torque test: torque (Nm); part.....:		N/A
C1.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
1.6 (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
1.6 (4.12.5)	Screwed glands; force (Nm)..... :	--	N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.13)	**Mechanical strength**		P
1.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm)..... :	--	N/A
	- other parts; energy (Nm)..... :	All enclosure:0.35Nm, no damage	P
	1) live parts		P
	2) linings		N/A
	3) protection		P
	4) covers		P
1.6 (4.13.3)	Straight test finger		P
1.6 (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
1.6 (4.13.6)	Tumbling barrel		N/A
1.6 (4.14)	**Suspensions, fixings and means of adjusting**		P
1.6 (4.14.1)	Mechanical load:		P
	A) four times the weight		P
	B) torque 2,5 Nm		N/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
1.6 (4.14.2)	Load to flexible cables		N/A
	Mass (kg) ..... :	--	—
	Stress in conductors (N/mm²) .....:	--	N/A
	Mass (kg) of semi-luminaire .....:	--	—
	Bending moment (Nm) of semi-luminaire .....:	--	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.14.3)	Adjusting devices:		N/A
	- flexing test; number of cycles..... :	--	N/A
	- strands broken..... :	--	N/A
	- electric strength test afterwards		N/A
1.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
1.6 (4.14.5)	Guide pulleys		N/A
1.6 (4.14.6)	Strain on socket-outlets		N/A
1.6 (4.15)	**Flammable materials**		P
	- glow- wire test 650°C..... :	See Test Table 1.15 (13.3.2)	P
	- spacing ≥30 mm		N/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
1.6 (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
1.6 (4.16)	**Luminaires for mounting on normally flammable surfaces**		P
	No lamp control gear.....:	(compliance with Section 12)	N/A
	Provided with adaptor for a track meet the requirements for direct mounting on normally flammable surfaces		N/A
1.6 (4.16.1)	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
1.6 (4.16.2)	Thermal protection:		N/A
	- in lamp control gear		N/A
	- external		N/A
	- fixed position		N/A
	- temperature marked lamp control gear		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N/A
1.6 (4.17)	**Drain holes**		N/A
	Clearance at least 5 mm		N/A
1.6 (4.18)	**Resistance to corrosion**		P
1.6 (4.18.1)	- rust- resistance		P
1.6(4.18.2)	- season cracking in copper		N/A
1.6 (4.18.3)	- corrosion of aluminium		P
1.6 (4.19)	Igniters compatible with ballast		N/A
1.6 (4.20)	Rough service vibration		N/A
1.6 (4.21)	**Protective shield**		N/A
1.6 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A
	Shield of glass if tungsten halogen lamps		N/A
1.6 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
1.6 (4.21.3)	No direct path		N/A
1.6 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment.....:	See Test Table 1.15 (13.3.2)	N/A
1.6 (4.22)	Attachments to lamps not cause overheating or damage		N/A
1.6 (4.23)	Semi-luminaires comply Class II		N/A
1.6 (4.24)	**Photobiological hazards**		P
1.6 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N/A
1.6 (4.24.2)	Retinal blue light hazard	RG0	P
	Luminaires with E_{thr} :		N/A
	a) Fixed luminaires		N/A
	- distance x m, borderline between RG1 and RG2... :		N/A
	- marking and instruction according 3.2.23		N/A
	b) Portable and handheld luminaires		N/A
	- marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778		N/A
	Portable luminaires for children IEC 60598-2-10 and Mains socket outlet nightlights IEC 60598-2-12 not exceed RG1 at 200 mm according to IEC/62778		N/A
1.6 (4.25)	**Mechanical hazard**		P

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	No sharp point or edges		P
1.6 (4.26)	**Short-circuit protection**		N/A
1.6 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N/A
1.6 (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
1.6 (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
1.6 (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
1.6 (4.29)	**Luminaires with non-replaceable light source**		**P**
	Not possible to replace light source		P
	Live part not accessible after parts have been opened by hand or tools		P
1.6 (4.30)	**Luminaires with non-user replaceable light source**		N/A
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		N/A
	Minimum two fixing means		N/A
1.6 (4.31)	**Insulation between circuits**		P

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Clause	Requirement + Test	Result - Remark	Verdict
	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
1.6 (4.31.1)	SELV circuits		N/A
	Used SELV source		N/A
	Voltage ≤ ELV		N/A
	Insulating of SELV circuits from LV supply		N/A
	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		N/A
	Plugs not able to enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Plugs and socket-outlets does not have protective conductor contact		N/A
1.6 (4.31.2)	FELV circuits		N/A
	Used FELV source		N/A
	Voltage ≤ ELV		N/A
	Insulating of FELV circuits from LV supply		N/A
	FELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Socket-outlets does not have protective conductor contact		N/A
1.6 (4.31.3)	Other circuits		P
	Other circuits insulated from accessible parts according Table X.1		P

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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 of above		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
1.6 (4.32)	**Overvoltage protective devices**		N/A
	Comply with IEC 61643-11		N/A
	External to control gear and connected to earth:		N/A
	- only in fixed luminaires		N/A
	- only connected to protective earth		N/A

1.7 (11)	**CREEPAGE DISTANCES AND CLEARANCES**		P
1.7 (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
1.7 (11.2.2)	Creepage distances for frequency up to 30 kHz	See Test Table 1.7 (11.2) I	P
	Creepage distances for frequency over 30 kHz:		N/A
	- Controlgear marked with $\hat{U}_{OUT}$ and f_{UOUT} according IEC 61347-1, clause 7.1, item w	See Test Table 1.7 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 1.7 (11.2) II	N/A
1.7 (11.2.3)	Clearances for frequency up to 30 kHz	See Test Table 1.7 (11.2) I	P
	Clearances distances for frequency over 30 kHz:		N/A
	- Controlgear marked with U_P	See Test Table 1.7 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 1.7 (11.2) II	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

1.8 (7)	**PROVISION FOR EARTHING**		N/A
1.8 (7.2.1 + 7.2.3)	Accessible metal parts		N/A
	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
1.8 (7.2.2 + 7.2.3)	Earth continuity in joints, etc.		N/A
1.8 (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
1.8 (7.2.5)	Earth terminal integral part of connector socket		N/A
1.8 (7.2.6)	Earth terminal adjacent to mains terminals		N/A
1.8 (7.2.7)	Electrolytic corrosion of the earth terminal		N/A
1.8 (7.2.8)	Material of earth terminal		N/A
	Contact surface bare metal		N/A
1.8 (7.2.10)	Class II luminaire for looping-in		N/A
	Double or reinforced insulation to functional earth		N/A
1.8 (7.2.11)	Earthing core coloured green-yellow		N/A
	Length of earth conductor		N/A

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

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Clause	Requirement + Test	Result - Remark	Verdict
1.9 (15)	**SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS**		P
	Separately approved; component list.....:	(see Annex 1)	P
	Part of the luminaire.....:	(see Annex 4)	N/A
1.10 (5)	**EXTERNAL AND INTERNAL WIRING**		P
1.10 (5.2)	**Supply connection and external wiring**		P
1.10 (5.2.1)	Means of connection.....:	Terminal block	P
	Outdoor luminaire has not PVC insulated external wiring if not class III or SELV ≤ 25 V a.c./60 V d.c. or protected from outdoor environment		N/A
1.10 (5.2.2)	Type of cable.....:		N/A
	Nominal cross-sectional area (mm²)..... :		N/A
	Cables equal to IEC 60227 or IEC 60245		N/A
1.10 (5.2.3)	Type of attachment, X, Y or Z		N/A
1.10 (5.2.5)	Type Z not connected to screws		N/A
1.10 (5.2.6)	Cable entries:		N/A
	- suitable for introduction		N/A
	- adequate degree of protection		N/A
1.10 (5.2.7)	Cable entries through rigid material have rounded edges		N/A
1.10 (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
1.10 (5.2.9)	Locking of screwed bushings		N/A
1.10 (5.2.10)	Cord anchorage:		N/A
	- covering protected from abrasion		N/A
	- clear how to be effective		N/A
	- no mechanical or thermal stress		N/A
	- no tying of cables into knots etc.		N/A
	- insulating material or lining		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
1.10 (5.2.10.1)	Cord anchorage for type X attachment:		N/A
	a) at least one part fixed		N/A
	b) types of cable		N/A
	c) no damaging of the cable		N/A
	d) whole cable can be mounted		N/A
	e) no touching of clamping screws		N/A
	f) metal screw not directly on cable		N/A
	g) replacement without special tool		N/A
	Glands not used as anchorage		N/A
	Labyrinth type anchorages		N/A
1.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		N/A
1.10 (5.2.10.3)	Tests:		N/A
	- impossible to push cable; unsafe		N/A
	- pull test: 25 times; pull (N)..... :		N/A
	- torque test: torque (Nm)..... :		N/A
	- displacement ≤ 2 mm		N/A
	- no movement of conductors		N/A
	- no damage of cable or cord		N/A
	- function independent of electrical connection		N/A
1.10 (5.2.11)	External wiring passing into luminaire		N/A
1.10 (5.2.12)	Looping- in terminals		N/A
1.10 (5.2.13)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		N/A
1.10 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A
1.10 (5.2.16)	Appliance inlets (IEC 60320)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Installation couplers (IEC 61535)		N/A
	Other appliance inlet or connector according relevant IEC standard		N/A
1.10 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
1.10 (5.2.18)	Used plug in accordance with		N/A
	- IEC 60083		N/A
	- other standard		N/A
1.10 (5.3)	**Internal wiring**		P
1.10 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		N/A
	- not delivered/ mounting instruction		N/A
	- factory assembled		N/A
	- socket outlet loaded (A)..... :	--	N/A
	- temperatures.....:	(see Annex 2)	N/A
	Green- yellow for earth only		N/A
1.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P
	Cross-sectional area (mm²)..... :	See Annex 1	P
	Insulation thickness		P
	Extra insulation added where necessary		N/A
1.10 (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
1.10 (5.3.1.3)	Double or reinforced insulation for class II		P
1.10 (5.3.1.4)	Conductors without insulation		N/A
1.10 (5.3.1.5)	SELV current-carrying parts		N/A
1.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
1.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Joints, raising/lowering devices		N/A
	Telescopic tubes etc.		N/A
	No twisting over 360°		P
1.10 (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
1.10 (5.3.4)	Joints and junctions effectively insulated		N/A
1.10 (5.3.5)	Strain on internal wiring		N/A
1.10 (5.3.6)	Wire carriers		N/A
1.10 (5.3.7)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		P
1.10 (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
1.11 (8)	**PROTECTION AGAINST ELECTRIC SHOCK**		P
1.11 (8.2.1)	Live parts not accessible		P
	Basic insulated parts not used on the outer surface without appropriate protection		P
	Basic insulated parts not accessible with standard test finger on portable, settable and adjustable luminaires		N/A
	Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires		P
	Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements		N/A
	Basic insulation only accessible under lamp or starter replacement		N/A
	Protection in any position		P
	Double-ended tungsten filament lamp		N/A
	Insulation lacquer not reliable		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Double-ended high pressure discharge lamp		N/A
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
1.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
1.11 (8.2.3.a)	Class II luminaire:		P
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A
	- basic insulation not accessible other than during starter or lamp replacement		P
	- glass protective shields not used as supplementary insulation		N/A
1.11 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N/A
1.11 (8.2.3.c)	SELV circuits with exposed current carrying parts:		N/A
	Ordinary luminaire:		N/A
	- touch current .....:	--	N/A
	- no-load voltage.....:	--	N/A
	Other than ordinary luminaire:		N/A
	- nominal voltage .....:	--	N/A
1.11 (8.2.4)	Portable luminaire have protection independent of supporting surface		N/A
1.11 (8.2.5)	Compliance with the standard test finger or relevant probe		P
1.11 (8.2.6)	Covers reliably secured		P
1.11 (8.2.7)	Discharging of capacitors ≥ 0,5 μF	0V	P
	Portable plug connected luminaire with capacitor		N/A
	Other plug connected luminaire with capacitor		N/A
	Discharge device on or within capacitor		N/A
	Discharge device mounted separately		N/A

1.12 (12)	**ENDURANCE TEST AND THERMAL TEST**	P
1.12 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 4.13	—

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Clause	Requirement + Test	Result - Remark	Verdict
1.12 (12.3)	Endurance test:		P
	a) mounting- position .....:	Normal used	—
	b) test temperature (°C).....:	55°C	—
	c) total duration (h) .....:	240h	—
	d) supply voltage (V).....:	264V~	—
	d) if not equipped with controlgear, constant voltage/current (V) or (A) .....:	--	—
	e) luminaire ceases to operate		—
1.12 (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
1.12 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
1.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	N/A
1.12 (12.6)	Thermal test (failed lamp control gear condition):		N/A
1.12 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A) .....:	--	—
	- case of abnormal conditions.....:	--	—
	- electronic lamp control gear		N/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
1.12 (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

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Clause	Requirement + Test	Result - Remark	Verdict
	- track-mounted luminaires		N/A
1.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N/A
1.12 (12.7.1)	Luminaire without temperature sensing control		N/A
1.12 (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 Table 1.15 (13.2.1)	N/A
1.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N/A
	- case of abnormal conditions.....:	--	—
	- measured winding temperature (°C): at 1,1 Un.....:	--	—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un..... :	--	—
	- calculated temperature of fixing point/exposed part (°C).....:	--	—
	Ball-pressure test.....:	See Table 1.15 (13.2.1)	N/A
1.12 (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

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Clause	Requirement + Test	Result - Remark	Verdict
1.12 (12.7.2)	Luminaire with temperature sensing control		N/A
	- thermal link.....:	Yes☐ No☐	—
	- manual reset cut-out.....:	Yes☐ No☐	—
	- auto reset cut-out.....:	Yes☐ No☐	—
	- case of abnormal conditions.....:	--	—
	- highest measured temperature of fixing point/ exposed part (°C):.....:	--	—
	Ball-pressure test:.....:	See Table 1.15 (13.2.1)	N/A
1.13 (9)	**RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE**		P
1.13 (-)	If IP > IP 20 the order of tests as specified in clause 1.12		P
1.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		—
	- classification according to IP.....:	IP54 for RAVOLK1400A IP44 for RAVOLI2400A	—
	- mounting position during test.....:	Normal installation	—
	- fixing screws tightened; torque (Nm).....:	2/3 torque of cl 4.12.1	—
	- tests according to clauses.....:	see clause 9.2.0, 9.2.1 and 9.2.5	—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		P
	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		P
	d) i) For luminaires without drain holes – no water entry		P
	d) ii) For luminaires with drain holes – no hazardous water entry		N/A
	e) no water in watertight luminaire		N/A
	f) no contact with live parts (IP 2X)		N/A
	f) no entry into enclosure (IP 3X and IP 4X)		P
	f) no contact with live parts (IP3X and IP4X)		P
	g) no trace of water on part of lamp requiring protection from splashing water		P
	h) no damage of protective shield or glass envelope		P

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Clause	Requirement + Test	Result - Remark	Verdict
1.13 (9.3)	Humidity test 48 h	25°C, 93%RH	P
1.14 (10)	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		P
1.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø .....:	Metal foil	—
	Insulation resistance (MΩ).....:	See below	—
	SELV		N/A
	- between current-carrying parts of different polarity:	--	N/A
	- between current-carrying parts and mounting surface.....:	--	N/A
	- between current-carrying parts and metal parts of the luminaire.....:	--	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
	Other than SELV		P
	- between live parts of different polarity..... :	>100 MΩ	P
	- between live parts and mounting surface.....:	>100 MΩ	P
	- between live parts and metal parts.....:	For the plastic enclosure:>100 MΩ	P
	- between live parts of different polarity through action of a switch.....:	--	N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :	--	N/A
	- Insulation bushings as described in Section 5 .....:	--	N/A
1.14 (10.2.2)	Electric strength test		P
	Dummy lamp		N/A
	Luminaires with ignitors after 24 h test		N/A
	Luminaires with manual ignitors		N/A
	Test voltage (V).....:	See below	P
	SELV		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- between current-carrying parts of different polarity:	--	N/A
	- between current-carrying parts and mounting surface.....:	--	N/A
	- between current-carrying parts and metal parts of the luminaire.....:	--	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
	Other than SELV		P
	- between live parts of different polarity.....:	1480Vac	P
	- between live parts and mounting surface.....:	2960Vac	P
	- between live parts and metal parts.....:	For the plastic enclosure: 2960Vac	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
1.14 (10.3)	Touch current or protective conductor current (mA).:	Max.0.09mA	P

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

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Clause	Requirement + Test	Result - Remark	Verdict

1.7 (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:	R	>8.0	3.0	Table 11.1.B	>8.0	5.0	Table 11.1.A	
Distance 2:	B	3.6	1.5	Table 11.1.B	3.6	2.5	Table 11.1.A	
Distance 3:	B	3.6	1.5	Table 11.1.B	3.6	2.5	Table 11.1.A	
Working voltage (V) ..... :					240V~			—
PTI ..... :					< 600 ☒ ≥ 600 ☐			—
Pulse voltage or U_P if applicable (kV) ..... :					--			—
Supplementary information: Distance 1: Between live parts and accessible enclosure. Distance 2: Between L and N. Distance 3: Between pins of fuse.								

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

1.7 (11.2)	TABLE II: Creepage distances and clearances							—
Minimum distances (mm) for a.c. higher than 30 kHz sinusoidal voltages								
Applicable part of IEC 61347-1 Table 7 and 8* or IEC 60664-4 Table 1 and 2								
Distances	Insulation type **	Measured clearance	Required		Measured creepage	Required		
			clearance	*Table		creepage	*Table	
Distance 1:	—	—	—	—	—	—	—	
Working voltage (V) ..... :					—			—
Frequency if applicable (kHz) ..... :					—			—
PTI ..... :					< 600 ☐ ≥ 600 ☐			—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :					—			—
Supplementary information:								

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

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

1.15 (13.2.1)	**TABLE: Ball Pressure Test of Thermoplastics**		**P**
Allowed impression diameter (mm) .....:		2.0mm	—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)
Plastic enclosure	See Annex 1	94.8	1.6
Lens	See Annex 1	82.4	1.2
Bobbin	See Annex 1	125	0.6
Driver PCB	See Annex 1	125	0.7
Quick connector	See Annex 1	125	1.2
Supplementary information:--			

1.15 (13.3.1)	**TABLE: Needle-flame test (IEC 60695-11-5)**				**P**
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Plastic enclosure	See ANNEX 1	30s	No	1.1s	P
Lens	See ANNEX 1	30s	No	1.6s	P
Bobbin	See ANNEX 1	30s	No	0s	P
Driver PCB	See ANNEX 1	30s	No	0s	P
Quick connector	See ANNEX 1	30s	No	0s	P
Supplementary information:--					

1.15 (13.3.2)	**TABLE: Glow-wire test (IEC 60695-2-11)**			**P**
Glow wire temperature .....:		650°C or 750°C		—
Object/ Part No./ Material	Manufacturer/ trademark	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Plastic enclosure (650°C)	See Annex 1	No	0s	P
Lens(650°C)	See Annex 1	No	0s	P
Bobbin(750°C)	See Annex 1	No	0s	P
Driver PCB(750°C)	See Annex 1	No	0s	P
Quick connector (750°C)	See Annex 1	No	0s	P

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

Terminal block(750°C)	See Annex 1	No	0s	P
Switch(750°C)	See Annex 1	No	0s	P
Any flame or glowing of the sample extinguished within 30 s of withdrawing the glow-wire, and any burning or molten drop did not ignite the underlying parts (Yes/No)..... :				Yes
Supplementary information:--				

1.15 (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
Plastic enclosure	See Annex 1	No burning	No burning	No burning	P
Lens	See Annex 1	No burning	No burning	No burning	P
Supplementary information:--					

IEC 60598-2-1			
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)]
Terminal block	B	Jiang Men Krealux Electrical Appliances Co.Ltd	P02-., P02-D, P02-.J, P02-D.J	450V,16A,24A	EN 60998-2-2 EN 60998-1	VDE 40021964
-Alt.	D	SHEN ZHEN Jia He Shun Technology CO., LTD	JHS-250-3.5	450V~, 5A, 0.5-1.5mm2, 120℃	DIN EN 60998-2-2	VDE 40050610
-Alt.	D	Putian Hanjiang Fucon Electronics Co., Ltd.	CM-250-3.5	450V; 5A, 0,5-1,5mm2; 120°C	EN IEC 60947-7-4	VDE 40037257
-Alt.	D	SHEN ZHEN Jia He Shun Technology CO., LTD	JHS-250-3.5	250V; 5A, 0,75mm2; 120°C	EN 60998-2-2 EN 60998-1	VDE 40050610
Input wire	B	Guangdong Yongrui Cable Technology Co.,Ltd	H03VH7-H	1 x 0,5...0,75 mm²	DIN VDE 0281-8	VDE 40027126
-Alt.	D	Zhongshan Weifeng Electric Appliance Co. LTD	H03VH7-H	1 x 0,5...0,75 mm²	DIN VDE 0281-8	VDE 40053180
-Alt.	D	SANSHUI CITY HENGDA ELECTRICAL CO LTD	1007	300VAC; 18AWG; 80°C	--	UL E229361
-Alt.	D	DONGGUAN CHENG XING ELECTRONIC CO LTD	1007	300VAC; 18AWG; 80°C	--	UL E249743
-Alt.	D	ZHONGSHAN CITY DONGSHENG TOWN BAOXU ELECTRICAL FACTORY	1007	300VAC; 18AWG; 80°C	--	UL E496532
-Alt.	D	XIN SHENG TERMINAL MFG LTD	1007	300VAC80°C 18AWG	--	UL E328303
Driver PCB	C	TOP TECH KNW ELECTRONIC CO LTD	FR-4	V-0; 130ºC	--	UL E320042
-Alt.	D	Kingboard Laminates Holdings Ltd.	KB-616(X), KB-6160A	V-0, 130°C	--	UL E123995
-Alt.	D	GOLDENMAX INTERNATIONAL TECHNOLOGY LTD	ILM-R1##	V-0; 130ºC	--	UL E134893
Fuse resistor	B	Shenzhen Great Electronics Co. Ltd	RXF	1W;0.1-600Ohm	EN 62368-1	VDE 40026608
Varistor	B	Fenghua Adv. Tech. (Holding) Co., Ltd.	FNR-07K471, 10D471K	470V,85°C	EN 61051-1	VDE 40008242
-Alt.	D	Dongguan City Dafu Electronics Co.Ltd	NDF 07D471K, 10D471K	470V,125°C	EN 61051-1	VDE 40050909

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

-Alt.	D	DongGuan City Jiankun Electronics Technology Co. Ltd	07D471K 10D471K	470V, T125	IEC 61051-1/-2/-2-2	VDE40046024
Magnet wire	C	DONG GUAN YIDA INDUSRIAL CO LTD	xPEW/155, QZ-x/155	155°C	--	UL E344055
-Alt.	D	SUZHOU TAIHU ELECTRIC ADVANCED MATERIAL CO LTD	TaiHu 155 A	155°C	--	UL E233623
Bobbin	C	Chang Chun Plastics Co., Ltd.	T375J; T375HF	V-0, 150°C	--	UL E59481
Insulation tape	C	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD	CT-280B	150°C	--	UL E165111
Switch	B	Foshan Rayven Lighting Co., Ltd.	SS23D35(2P 3T)	DC50V, 30mA, 1E4	IEC 61058-1	LCS211108168AS
-Alt.	D	Dongguan Yisheng Electronic Technology Co.LTD	SS23D35G5	DC150V, 0.5A, 1E4	IEC 61058-1	Tested with appliance
Quick connector	C	ZHEJIANG HONGXING ELECTRICAL CO LTD	HX2000X-YYY	--	--	UL E228500
LED PCB	C	KINGBOARD LAMINATES HOLDINGS LTD	CEM-1	V-0; 130ºC	--	UL E123995
LED	C	XUYU OPTOELECTRONICS(SHENZHEN)CO., LTD.	2835	VF:3V IF:60MA 3000K-5000K	IEC TR 62778 IEC 62031	Tested with appliance
Plastic enclosure	C	CHIMEI CORPORATION	PC-110(+)	V-2; PC	--	UL E56070
Lens	C	JINYONG (XIAMEN) ADVANCED MATERIALS TECHNOLOGY CO., LTD	C500	PC; V-2	--	UL E475922
-Alt.	D	Zhejiang Polymer.1 New Material Tech Co Ltd	GON535N	PS: HB	--	UL E539533

Supplementary information:

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

The codes above have the following meaning:

A- The component is replaceable with another one, also certified, with equivalent characteristics

B- The component is replaceable if authorised by the test house

C- Integrated component tested together with the appliance

D- Alternative component

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

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12		P
	Type reference.....:	RAVOLI2400A	—
	Lamp used.....:	LED module	—
	Lamp control gear used.....:	Integral LED driver	—
	Mounting position of luminaire.....:	See product manual	—
	Supply wattage (W).....:	29.9W	—
	Supply current (A)..... :	0.125A	—
	Calculated power factor.....:	0.942	—
	Table: measured temperatures corrected for ta = 45 °C:		P
	- abnormal operating mode.....:	Short-circuited output of LED driver.LED driver protection immediately	—
	- test 1: rated voltage..... :	--	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage.....:	1.06x240V=254.4V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage..... :	--	—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage.....:	--	—
	- test 5: 1,15 times rated power input..... :	--	—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :	--	—

Temperature measurements, (°C)

Part	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1	test 2	test 3	limit	test 4	limit
Terminal block	--	50.5	--	110	--	--
Input wire	--	66.1	--	80	--	--
RV1	--	72.5	--	125	--	--
L4	--	74.6	--	155	--	--
EC2	--	79.4	--	105	--	--
T1 winding	--	87.1	--	155	--	--
T1 bobbin	--	85.4	--	150	--	--
C3	--	80.1	--	105	--	--

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

C10	--	77.5	--	105	--	--
SW1	--	66.4	--	Ref.	--	--
Driver PCB	--	80.1	--	130	--	--
Quick connector	--	56.3	--	Ref.	--	--
Wire near LED	--	71.5	--	80	--	--
LED PCB	--	78.7	--	130	--	--
Lens	--	57.4	--	130	--	--
Plastic enclsoure near T1	--	69.8	--	130	--	--
Mounting surface	--	48.1	--	90	--	--
Ambient	--	45.0	--	--	--	--

ANNEX 2	**TABLE: Temperature measurements, thermal tests of Section 12**		P
	Type reference.....:	RAVOLI2400B	—
	Lamp used.....:	LED module	—
	Lamp control gear used.....:	Integral LED driver	—
	Mounting position of luminaire.....:	See product manual	—
	Supply wattage (W).....:	30.3W	—
	Supply current (A)..... :	0.126A	—
	Calculated power factor.....:	0.942	—
	Table: measured temperatures corrected for ta = 45 °C:		P
	- abnormal operating mode.....:	Short-circuited output of LED driver.LED driver protection immediately	—
	- test 1: rated voltage..... :	--	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage.....:	1.06x240V=254.4V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage..... :	--	—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage.....:	--	—
	- test 5: 1,15 times rated power input..... :	--	—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :	--	—

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

Temperature measurements, (°C)						
Part	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1	test 2	test 3	limit	test 4	limit
Terminal block	--	50.1	--	110	--	--
Input wire	--	66.4	--	80	--	--
RV1	--	75.3	--	125	--	--
LF1	--	80.5	--	155	--	--
CX1	--	84.0	--	110	--	--
L1	--	79.7	--	155	--	--
EC2	--	83.6	--	105	--	--
L3 winding	--	90.8	--	155	--	--
L3 bobbin	--	88.6	--	150	--	--
EC1	--	83.7	--	105	--	--
EC4	--	81.5	--	105	--	--
EC3	--	81.7	--	105	--	--
XH2	--	68.9	--	Ref.	--	--
SW1	--	65.3	--	Ref.	--	--
Driver PCB	--	82.5	--	130	--	--
Quick connector	--	58.4	--	Ref.	--	--
Wire near LED	--	72.6	--	80	--	--
LED PCB	--	79.1	--	130	--	--
Lens	--	60.7	--	130	--	--
Plastic enclsoure near T1	--	74.5	--	130	--	--
Mounting surface	--	48.2	--	90	--	--
Ambient	--	45.0	--	--	--	--

IEC 60598-2-1			
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).....:		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

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

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

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

Attachment No.1

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

APPENDIX ZZ
VARIATIONS TO IEC 60598-1, Ed. 8.0 (2014) FOR AUSTRALIA AND NEW ZEALAND

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

Attachment No.1

AS/NZS 60598.1:2017+A1:2017+A2:2020			
Clause	Requirement + Test	Result - Remark	Verdict
	Capacitors (**other than those incorporated in control gear** that comply with there levant standard) shall comply with one of the following: - Capacitors likely to be permanently subjected to the supply voltage, used for radio interference suppression or for voltage dividing shall comply with IEC 60384-14. - Other capacitors shall be not less than Type B capacitors with metal body and break action protection in accordance with IEC 61048 and IEC 61049. A capacitor complying with EIA-456-A, Metallized Film Dielectric Capacitors for Alternating Current Applications, shall comply with IEC 61049 and IEC 61048:2006 excluding the endurance test of 18.1.1.		N/A
	In addition, capacitors shall have a minimum voltage rating of 250 V at a temperature rating of 100 °C or 280 V at a temperature rating of 85 °C.		N/A
0.5.102	**Add:**Control gear		P
	Power supplies shall comply with the relevant part 2 of the AS/NZS 61558series.		N/A
	Control gear shall comply with the relevant part 2 of the AS/NZS 61347series.		P
	Battery chargers used for lighting other than emergency lighting shall comply with AS/NZS 60335.2.29.		N/A
	Sensor switches and similar control circuits, including those incorporated in other equipment, are considered electronic switches (see Clause 4.8).		P
2	**CLASSIFICATION OF LUMINAIRES**		N/A
2.2	**Class 0 luminaires** are not permitted in Australia or New Zealand.		—
3	**MARKING**		**P**
3.1	In Australia and New Zealand, instructions and other texts required by this Standard shall at least be written in English.		P
3.2	**Delete** the second paragraph beginning with 'Marking may be on ballast provided…'.		P

Attachment No.1

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

Attachment No.1

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

Attachment No.1

AS/NZS 60598.1:2017+A1:2017+A2:2020			
Clause	Requirement + Test	Result - Remark	Verdict
	Electronic switches, when incorporated in or supplied with the luminaire, shall comply with the requirements of AS/NZS 60669.2.1 or IEC 61058-1 classified for 10,000 operating cycles	for 10,000 operating cycles	P
4.10.4	**Delete the last sentence and replace with the following:** If the working voltage does not exceed the rated voltage of the capacitor, accessible conductive parts separated from live parts by double or reinforced insulation, as above, may be bridged by a single Y1 capacitor with qualification approval as specified in IEC 60384-14.		N/A
4.14.6	**Add:** A fixed socket-outlet complying with AS/NZS 3112 or AS/NZS 60884.1 is used for the test.		N/A
4.32	**Delete the text and replace with the following:**		—
4.32.1	**General**		N/A
	To limit the effects of lightning surges and other transient overvoltages, overvoltage protective devices may be used in luminaires and they can be either □ Surge protective devices (SPDs), or □ Surge protective components (SPCs).		N/A
4.32.2	**Surge protective devices (SPDs)**		N/A
	SPDs shall comply with IEC 61643-11. SPDs that are external to controlgear and connected to earth shall be used only in fixed luminaires and shall be connected only to a protective earth.		N/A
4.32.3	**Surge protective components (SPCs)**		N/A
	SPCs that are **external to controlgear** shall comply with the requirements of AS/NZS 3100 for varistors.		N/A
(3.16)	**Metal Oxide Varistors incorporated in accessories**		N/A
	(a) MOVs shall comply with IEC 61051-2.		N/A

Attachment No.1

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

Attachment No.1

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

Attachment No.1

AS/NZS 60598.1:2017+A1:2017+A2:2020			
Clause	Requirement + Test	Result - Remark	Verdict
5.2.1	First paragraph **replaced by**: Luminaires shall be provided with only one of the following means of connection and isolation to the supply. Fixed luminaires: – device for the connection of luminaires; – terminals; – plug for engagement with socket-outlets; – connecting leads (tails) in accordance with Clause 4.6 requirements; – supply cord; – supply cord and plug; – adapter for engagement with supply tracks; – appliance inlet; – installation coupler; – luminaire coupler. Portable luminaires: – supply cord with plug; – appliance inlet; – inlet plug complying with AS/NZS 3120. Track-mounted luminaires: — adaptor; — connector.	Terminal block	P
	Delete the second and third paragraph.		—
	In Australia, non-portable luminaires with a supply cord shall be fitted with a plug complying with AS/NZS 3112 or a coupler complying with the relevant standard, except where the luminaire has markings and instructions that comply with Clause 3.2.12, in which case, a plug or coupler is not required. For other than portable luminaires a plug is not required if the luminaire has markings and instructions in accordance with Clause 3.2.12.		N/A
	The plug portion of a luminaire with integral pins shall comply with there levant requirements of AS/NZS 3112.		N/A
	NOTE 4 PVC-insulated connection cords should not be used with outdoor luminaires in cold alpine locations.		—

Attachment No.1

AS/NZS 60598.1:2017+A1:2017+A2:2020

Clause	Requirement + Test	Result - Remark	Verdict
5.2.2	First paragraph **replaced by**: Supply cords used as a means of connection to the supply, when supplied by the luminaire manufacturer, shall be at least equal in their mechanical and electrical properties to those specified in IEC 60227 and IEC 60245, as indicated in Table 5.1, or AS/NZS 3191, and shall be capable of withstanding, without deterioration, the highest temperature to which they may be exposed under normal conditions of use.		N/A
	Table 5.1 — Supply cord		N/A

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

[a] For indoor use only.

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

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

Third paragraph **replaced by**:

To provide adequate mechanical strength, the nominal cross-sectional area of the conductors shall be not less than:
— 0,75 mm^2;
— 1,0 mm^2 for portable rough service luminaires.

Attachment No.1

AS/NZS 60598.1:2017+A1:2017+A2:2020			
Clause	Requirement + Test	Result - Remark	Verdict
5.2.16	**Add:** Class II luminaires for fixed wiring incorporating an appliance coupler shall not have means to allow further luminaires to be connected, including looping in by cascading. Luminaire couplers incorporated with the luminaire shall comply with IEC 61995-1. Luminaires incorporating installation couplers may have means to allow further luminaires to be connected by cascading provided the through wiring is rated for the current rating of the installation coupler.		N/A
5.2.18	**Replaced by:** All portable luminaires with a flexible supply cord shall be fitted with a plug complying with AS/NZS 3112. **Other luminaires** with flexible cords shall befitted with a plug complying with AS/NZS 3112, unless they have the warning allowed by Clause 3.2.12.		N/A
5.3.1	Third paragraph **replaced with** the following: Internal wires coloured green, yellow or green/yellow combination shall be used for making protective earth connections only. **Functional earth** connections shall not be made by wires coloured green, yellow or green/yellow combination.		P
	NOTE 3 Internal wires of other colours are not precluded from making protective earthing connections		—
5.3.1.3	**Replaced by**: In class II luminaires, where the internal wiring has a live conductor and the wiring insulation may touch accessible metal parts under normal operating conditions, the insulation, at least at the places of contact, shall comply with the requirements for double or reinforced insulation, e.g. by applying sheathed cables or sleeves.		N/A
7	**PROVISION FOR EARTHING**		N/A
7.2.11	Third paragraph **replaced with** the following: All conductors, whether internal or external, coloured green, yellow or green/yellow combination, shall only be connected to an earthing terminal.		N/A

Attachment No.1

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

Attachment No.1

AS/NZS 60598.1:2017+A1:2017+A2:2020			
Clause	Requirement + Test	Result - Remark	Verdict
	Delete the seventh paragraph which reads: For fixed Class 1 luminaires, overvoltage protective devices that comply with IEC 61643-11 shall be disconnected from the circuit.		—
10.3	**Delete** the second row beginning with 'Class I luminaires rated up to and including 16 A…'. First column, third row, deletes the word 'Metal'.		—
12	**ENDURANCE TEST AND THERMAL TEST**		**P**
Table 12.1	First column, first row, the text **replaced by**: 'Case (of **control gear**, capacitor, starting device, electronic ballast or convertor, etc.)'		—
	Add: NOTE 101 Luminaire manufacturers should consider the maximum ambient air temperature in the vicinity of components such as starting devices and electronic ballasts or converters. Component performance specifications advise manufacturers to mark or supply life data as maximum ambient air temperature based on 50,000 h. This t-life is often marked as ta and is the temperature of the air in the vicinity of the component and is not related to the luminaire ta. As such, luminaire manufacturers should measure air temperature in the vicinity of such components, within the luminaire, as even those complying with their tc point measurements can still fail prematurely if t-life is exceeded.		—
13.3	Resistance to flame and ignition		P
	Parts of non-metallic material shall be resistant to flame and ignition		P
	For materials other than ceramic, compliance is checked by the tests of 13.3.1 and 13.3.2, and 13.3.3 as appropriate.		P
	This requirement does not apply to decorative trims, knobs, wiring insulation and other parts not likely to be ignited or to propagate flames from inside the luminaire		P
	This Clause applies to all parts, including components, even if they have been tested to their own IEC or equivalent standard		P

Attachment No.1

AS/NZS 60598.1:2017+A1:2017+A2:2020			
Clause	Requirement + Test	Result - Remark	Verdict
13.3.1	Parts of non-metallic material supporting connections that could become an ignition source, and parts of non-metallic material within a distance of 3 mm of such connections, shall withstand the glow wire test		P
	Welded connections, soldered connections on printed circuit boards and other connections carrying less than 0.2 A during normal operation are not considered to be an ignition source.		P
	The glow wire is heated to 750 °C and applied to one test sample for 30 s	See table 13.3.2 in IEC 60598-2-1 report	P
13.3.2	All other parts of non-metallic material which do not support connections that could become an ignition source, but provide protection against electric shock or maintain creepage and clearances, shall withstand the glow wire test.		P
	The glow wire is heated to 650 °C and applied to one test sample for 30 s	See table 13.3.2 in IEC 60598-2-1 report	P
13.3.3	During the application of the glow wire test of Clause 13.3.1 and 13.3.2, if a flame is produced that persists for longer than 2 s, the luminaire is further tested as follows: The needle-flame is applied to one test sample for 30 s.		N/A
	The needle-flame test of AS/NZS 60695.11.5 is applied to non-metallic parts that encroach within the envelope of a vertical cylinder having a diameter of 20 mm and a height of 50 mm above the point of application of the glow wire.		N/A
	Parts shielded by a barrier that meets the needle-flame test of AS/NZS 60695.11.5 are not tested.		N/A
	The needle-flame test is not carried out on parts that are made of material classified as V-0 or V-1 according to IEC 60695-11-10. The sample of material submitted to the test of IEC 60695-11-10 shall be no thicker than the relevant part.		N/A

Attachment No.2

AS/NZS 60598.2.1:2014+A1:2016+A2:2019			
Clause	Requirement + Test	Result - Remark	Verdict
	Variations to AS/NZS 60598.2.1:1998 for application in Australia and/or New Zealand (AS/NZS 60598.2.1:2014+A1:2016+A2:2019)		**P**
1	**SCOPE**		**P**
	This Standard specifies requirements for fixed general purpose luminaires incorporating electric light sources for operation on supply voltages less than 1000V AC RMS or 1500V ripple-free DC (high voltage). It is to be read in conjunction with those sections of AS/NZS 60598.1 to which reference is made. This Standard also specifies requirements for double-capped LED lamps (Appendix A) and T8 to T5 lamp converters (Appendix B). Appendix A is to be read in conjunction with those sections of AS/NZS 60598.1 to which reference is made. Appendix B is to be read in conjunction with those sections of AS/NZS 60598.1 and AS/NZS 61347.2.3 or AS/NZS 61347.1 to which reference is made.		P
6	**MARKING**		**N/A**
	LED luminaires with G5 or G13 lampholders shall be marked with the following warning: WARNING: NOT FOR USE WITH ANY FLUORESCENT LAMP—FOR USE ONLY WITH TYPE A LED LAMPS		N/A
7	**CONSTRUCTION**		**N/A**
	LED luminaires or new luminaires designed for T8 to T5 converters with G5 and G13 lampholders shall include a fuse to protect a fluorescent lamp that is inadvertently installed.		N/A
	Each fuse shall—		N/A
	a) be of the 250 V HBC type		N/A
	b) have a 2 A max. quick-acting type rating; and		N/A
	c) be used to protect a maximum of two lamps.		N/A
13	**ENDURANCE TESTS AND THERMAL TESTS**		N/A
	Luminaires with an IP classification greater than IP20 shall be subjected to the relevant tests of Clauses 12.4, 12.5 and 12.6 of Section 12 of AS/NZS 60598.1 after the test(s) of Clause 9.2 but before the test(s) of Clause 9.3 of Section 9 of AS/NZS 60598.1 specified in Clause 14 of this Standard.		N/A
14	**RESISTANCE TO DUST AND MOISTURE**		N/A
	For luminaires with an IP classification greater than IP20 the order of the tests specified in Section 9 of AS/NZS 60598.1 shall be as specified in Clause 13 of this Standard.		N/A

Attachment No.2

AS/NZS 60598.2.1:2014+A1:2016+A2:2019			
Clause	Requirement + Test	Result - Remark	Verdict
APPENDIX A	**SAFETY REQUIREMENTS FOR DOUBLE-CAPPED LED LAMPS**		**N/A**
	The requirement is not applicable due to the nature of the product.		—
APPENDIX B	**SAFETY REQUIREMENTS FOR T8 TO T5 LAMP CONVERTERS**		**N/A**
	The requirement is not applicable due to the nature of the product.		—

Attachment No.3

IEC 62031:2018
LED modules for general lighting - Safety specifications

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

Attachment No.4

IEC TR 62778:2014 Spectroradiometric measurement			
Clause	Requirement + Test	Result - Remark	Verdict

	Spectroradiometric measurement (IEC TR 62778:2014)		**P**
	Measurement performed on:	**Luminaire**	**--**
	Model number.....:	RAVOLI2400A	**--**
	Test voltage (V).....:	240Vac	**--**
	Test current (mA).....:	--	**--**
	Test frequency (Hz).....:	50	**--**
	Measurement distance.....:	☒ 20 cm ☐ ... cm	**--**
	Source size .....:	☒ Non-small ☐ Small : .... mm	**--**
	Field of view .....:	☐ 100 mrad ☒ 11 mrad ☐ 1,7 mrad (for small sources)	**--**

Item	Symbol	Units	Result	Risk Group
Correlated colour temperature	CCT	K	--	--
x/y colour coordinates	--	--	--	--
Blue light hazard radiance	L_B	W/(m²•sr¹)	21	☒ RG0: <100 ☐ RG1: <10000 ☐ RG2: <4000000
Blue light hazard irradiance	E_B	W/m²	--	--
Luminance	L	cd/m²	--	--
Illuminance	E	lx	--	--
Supplementary information:--				

Attachment No.5

IEC 61347-2-13:2014+A1:2016			
Clause	Requirement + Test	Result - Remark	Verdict
4 (4)	**GENERAL REQUIREMENTS**		**P**
- (4)	Insulation materials according requirements in Annex N of IEC 61347-1	(see Annex N)	N/A
- (4)	Compliance of independent controlgear enclosure with IEC 60598- 1		N/A
	IP classification		N/A
	Mechanical stress		N/A
- (4)	Built-in magnetic ballast with double or reinforced insulation comply with Annex I of IEC 61347-1		N/A
- (4)	Built-in electronic controlgear with double or reinforced insulation comply with Annex O of IEC 61347-1	(see Annex O)	N/A
	Integral lamp controlgear compliance with clause 0.5 of EN 60598-1		P
4 (4)	SELV controlgear comply with Annex I of this part 2 and Annex L of IEC 61347-1		N/A
4 (-)	Transformer comply with IEC 61558		N/A
	Dielectric strength test of insulated winding wires is limited to 3 kV if input voltage ≤ 300 V		N/A

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

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

Attachment No.5

IEC 61347-2-13:2014+A1:2016			
Clause	Requirement + Test	Result - Remark	Verdict
	c) symbol for independent controlgear, if applicable		N/A
	d) correlation between interchangeable parts and controlgear marked		N/A
	e) rated supply voltage (V)		N/A
	supply frequency (Hz)		N/A
	supply current (A)		N/A
	f) earthing symbol		N/A
	g) rated maximum operating temperature of the winding		N/A
	h) indication that the lamp controlgear		N/A
	indication of the cross-section of conductors for which the terminals.		N/A
	j) the lamp type and rated wattage or wattage range for which the lamp controlgear is suitable, or the designation as indicated on the lamp data sheet of the type(s) of lamp(s) for which the lamp controlgear is designed		N/A
	k) wiring diagram		N/A
	l) value of t_c		N/A
	m) symbol for declared temperature		N/A
	n) heat sink(s)		N/A
	o) the limiting temperature		N/A
	p) the test period for the endurance test		N/A
	q) for lamp controlgear for which a constant S		N/A
	r) the rated no-load output voltage, when it is higher than the supply voltage		N/A
	s) symbol indicating the kind of controlgear providing SELV		N/A
	t) LUM earthing symbol		N/A
	u) if not SELV maximum working voltage U_{out} between:		N/A
	- output terminals (V) .....:	--	N/A
	- output terminals and earth (V) .....:	--	N/A

Attachment No.5

IEC 61347-2-13:2014+A1:2016			
Clause	Requirement + Test	Result - Remark	Verdict
	v) Declaration of the maximum equivalent output peak voltage Up		N/A
	w) maximum output peak voltage Ûout and its corresponding frequency fUout		N/A
7.1 (-)	Constant voltage type:	Yes ☐ No ☐	—
	- rated output power P_{rated} (W) .....:	--	N/A
	- rated output voltage U_{rated} (V) .....:	--	N/A
	Constant current type:	Yes ☐ No ☐	—
	- rated output power P_{rated} (W) .....:	--	N/A
	- rated output current I_{rated} (A) .....:	--	N/A
	Indication if for LED modules only		N/A
7.1 (7.2)	Marking durable and legible		N/A
	Rubbing 15 s water, 15 s petroleum; marking legible		N/A
7.2 (7.1)	Information to be provided, if applicable		N/A
	h) declaration on protection against accidental contact		N/A
	i) cross-section of conductors (mm²)		N/A
	j) number, type and wattage of lamp(s)		N/A
	s) SELV symbol		N/A
7.2 (-)	- declaration of mains connected windings		N/A

8 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		—
- (10.1)	Controlgear protected against accidental contact with live parts	Integral controlgear to be built into the end-product and relies upon end-product enclosure for protection.	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

Attachment No.5

IEC 61347-2-13:2014+A1:2016			
Clause	Requirement + Test	Result - Remark	Verdict
- (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
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		N/A
	SELV outputs separated by at least basic insulation		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
9 (8)	**TERMINALS**		N/A
	Screw terminals according section 14 of IEC 60598-1:		N/A
	Separately approved; component list	(see Annex 1)	N/A
	Part of the controlgear	See IEC 60598-2-1 ANNEX 3	N/A

Attachment No.5

IEC 61347-2-13:2014+A1:2016			
Clause	Requirement + Test	Result - Remark	Verdict
	Screwless terminals according section 15 of IEC 60598-1:		N/A
	Separately approved; component list	(see Annex 1)	N/A
	Part of the controlgear	See IEC 60598-2-1 ANNEX 4	N/A
10 (9)	**PROVISION FOR PROTECTIVE EARTHING**		—
- (9.1)	Provisions for protective earthing		N/A
	Terminal complying with clause 8		N/A
	Locked against loosening and not possible to loosen by hand		N/A
	Not possible to loosen clamping means unintentionally on screwless terminals		N/A
	Earthing via means of fixing		N/A
	Earthing terminal only used for the earthing of the control gear		N/A
	All parts of material minimizing the danger of electrolytic corrosion		N/A
	Made of brass or equivalent material		N/A
	Contact surface bare metal		N/A
- (9.2)	Provision for functional earthing		N/A
	Comply with clause 8 and 9.1		N/A
- (9.3)	Earth contact via the track on the printed board		N/A
	Test with a current of 25 A between earthing terminal and each of the accessible metal parts; measured resistance (Ω) at ≥ 10 A according 7.2.3 of IEC 60598-1: < 0,5 Ω ..... :		N/A
- (9.4)	Earthing of built-in lamp controlgear		N/A
	Earth by means of fixing to earthed metal of luminaire in compliance of 7.2 of IEC 60598-1		N/A
	Earthing terminal only for earthing the built-in controlgear		N/A
- (9.5)	Earthing via independent controlgear		N/A
- (9.5.1)	Earth connection to other equipment		N/A
	Looping or through connection, conductor min. 1,5 mm² and of copper or equivalent		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Protective earthing wires in line with 5.3.1.1 and clause 7		N/A
- (9.5.2)	Earthing of the lamp compartments powered via the independent lamp controlgear		N/A
	Test with a current of 25 A between input and output earth terminals; measured resistance (Ω) between earthing terminal and each of the accessible metal parts at ≥ 10 A according 7.2.3 of IEC 60598-1: < 0,5 Ω ..... :	--	N/A
	Output earthing terminal marked as in 7.1 t) of IEC 61347-1		N/A
11 (11)	**MOISTURE RESISTANCE AND INSULATION**		**P**
	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance with d.c. 500 V (MΩ):		P
	For basic insulation ≥ 2 MΩ ..... :	> 100 MΩ	P
	For double or reinforced insulation ≥ 4 MΩ ..... :		N/A
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		N/A
12 (12)	**ELECTRIC STRENGTH**		**P**
	Immediately after clause 11 electric strength test for 1 min		P
	Basic insulation for SELV, test voltage 500 V		N/A
	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	1480Vac	P
	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

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IEC 61347-2-13:2014+A1:2016			
Clause	Requirement + Test	Result - Remark	Verdict
13(13)	**THERMAL ENDURANCE TEST FOR WINDINGS OF BALLAST**		—

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

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Clause	Requirement + Test	Result - Remark	Verdict
15 (-)	**TRANSFORMER HEATING**		N/A
15.1(-)	General		N/A
	Transformer comply with clause L.6 and L.7 of IEC 61347-1		N/A
	Output voltage of SELV controlgear not exceed limits in 10.4 of IEC 61347-1 during the test of 15.1 and 15.2		N/A
15.2 (-)	Normal operation		N/A
	Comply with clause L.6 of IEC 61347-1		N/A
15.3 (-)	Abnormal operation		N/A
	Comply with clause L.7 of IEC 61347-1		N/A
	Double LED modules or equivalent load connected in parallel to the output terminals of constant voltage type		N/A
	Double LED modules or equivalent load connected in series to the output terminals of constant current type		N/A
	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		N/A
16 (15)	**CONSTRUCTION**		**P**
- (15.1)	Wood, cotton, silk, paper and similar fibrous material		P
	Wood, cotton, silk, paper and similar fibrous material not used as insulation	No such material used	P
- (15.2)	Printed circuits		P
	Printed circuits used as internal connections complies with clause 14		P
- (15.3)	Plugs and socket-outlets used in SELV or ELV circuits		N/A
	No dangerous compatibility between output socket-outlet and a plug for socket-outlets for input circuit in relation to installation rules, voltages and frequencies		N/A
	Plugs and socket-outlets for SELV comply with IEC 60906-3 and IEC 60884-2-4		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Plugs and socket-outlets for SELV ≤ 3 A, ≤ 25 V r.m.s. or ≤ 60 V d.c. and ≤ 72 W comply with IEC 60906-3 and IEC 60884-2-4 or:		N/A
	- plugs not able to enter socket-outlets of other standardised system		N/A
	- socket-outlets not admit plugs of other standardised system		N/A
	- socket-outlets without protective earth		N/A
- (15.4)	Insulation between circuits and accessible parts		P
- (15.4.2)	SELV circuits		N/A
	Source used to supply SELV circuits:		N/A
	- safety isolating transformer in accordance with relevant part 2 of IEC 61558		N/A
	- controlgear providing SELV in accordance with relevant part 2 of IEC 61347		N/A
	- another source		N/A
	Voltage in the circuit not higher than ELV		N/A
	SELV circuits insulated from LV by double or reinforced insulation		N/A
	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		N/A
	Source used to supply FELV circuits:		N/A
	- 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		N/A
	- another source		N/A
	- source in circuits separated by the LV supply by basic insulation		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Voltage in the circuit not higher than ELV		N/A
	FELV circuits insulated from LV supply by at least basic insulation		N/A
	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		P
	Insulation between circuits other than SELV or FELV and accessible conductive parts in according Table 6 in 15.4.5.		P
-(15.4.5)	Insulation between circuits and accessible conductive parts		N/A
	Accessible conductive parts shall be insulated from active parts of electric circuit by an insulation according to Table 6		N/A
	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

17 (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

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Clause	Requirement + Test	Result - Remark	Verdict
	Insulating lining of metallic enclosures		P
	Controlgear protected against pollution comply with Annex P	(see Annex P)	N/A
- (16.2)	**Creepage distances**		**P**
- (16.2.2)	Minimum creepage distances for working voltages		P
	Creepage distances according to Table 7	(see appended table)	P
- (16.2.3)	Creepage distances for working voltages with frequencies above 30 kHz		N/A
	Creepage distances according to Table 8	(see appended table)	N/A
- (16.3)	**Clearances**		**P**
- (16.3.2)	Clearances for working voltages		P
	Clearances distances according to Table 9	(see appended table)	P
- (16.3.3)	Clearances for ignition voltages and working voltages with higher frequencies		N/A
	Clearances distances for basic or supplementary insulation according to Table 10	(see appended table)	N/A
	Clearances distances for reinforced insulation according to Table 11	(see appended table)	N/A
18 (17)	**SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS**		**P**
	Screws, current-carrying parts and connections in compliance with IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1)		P
(4.11)	Electrical connections		P
(4.11.1)	Contact pressure		N/A
(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

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Clause	Requirement + Test	Result - Remark	Verdict
	Torque test: torque (Nm); part.....:	--	N/A
	Torque test: torque (Nm); part.....:	--	N/A
(4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
(4.12.4)	Locked connections:		N/A
	- fixed arms; torque (Nm)..... :	--	N/A
	- lampholder; torque (Nm).....:	--	N/A
	- push-button switches; torque 0,8 Nm.....:	--	N/A
(4.12.5)	Screwed glands; force (Nm)..... :	--	N/A

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

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

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

14	**TABLE: tests of fault conditions**	**P**
Part	Simulated fault	Hazard
For model RAVOLI2400A		
BD1	Short circuit	~~YES~~/NO
D2	Short circuit	~~YES~~/NO
Q5	Short circuit	~~YES~~/NO
Q4	Short circuit	~~YES~~/NO
C9	Short circuit	~~YES~~/NO
C10	Short circuit	~~YES~~/NO

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Clause	Requirement + Test	Result - Remark	Verdict

Output (+&-)	Short circuit	~~YES~~/NO
For model RAVOLI2400B		
BD1	Short circuit	~~YES~~/NO
Q1	Short circuit	~~YES~~/NO
D2	Short circuit	~~YES~~/NO
Q2	Short circuit	~~YES~~/NO
EC1	Short circuit	~~YES~~/NO
EC2	Short circuit	~~YES~~/NO
EC3	Short circuit	~~YES~~/NO
EC4	Short circuit	~~YES~~/NO
EC5	Short circuit	~~YES~~/NO
EC6	Short circuit	~~YES~~/NO
Output (+&-)	Short circuit	~~YES~~/NO

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Clause	Requirement + Test	Result - Remark	Verdict

17 (16)	TABLE: clearance and creepage distance measurements (mm)							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:	B	See below	1.5	Table 9	See below	2.5	Table 7	
Working voltage (V)..... :					240V			—
Frequency if applicable (kHz)..... :					50			—
PTI..... :					< 600 ☒ ≥ 600 ☐			—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :					--			—
Pulse voltage if applicable (kV) ..... :					--			—
Supplementary information: See report IEC 60598-2-1								

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

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Clause	Requirement + Test	Result - Remark	Verdict

19 (18.1)	**TABLE: Ball Pressure Test** See IEC60598-2-1 part				**P**
Allowed impression diameter (mm)..... :		2 mm			—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)		
--	--	--	--		
Supplementary information:					

19 (18.2)	**TABLE: Test of printed boards**				**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
Driver PCB	See annex 1	30	No	0	P
Supplementary information:					

19 (18.3)	**TABLE: Glow-wire test** See IEC60598-2-1 part				**P**
Glow wire temperature..... :		650°C			—
Object/ Part No./ Material	Manufacturer/ trademark	Ignition of specified layer Yes/No	Duration of burning (s)	Verdict	
--	--	--	--	--	
Supplementary information:					

19 (18.4)	**TABLE: Needle-flame test** See IEC60598-2-1 part				**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
--	--	--	--	--	--
Supplementary information:					

19 (18.5)	**TABLE: Proof tracking test**		**N/A**
Test voltage PTI .....:	175 V		—

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Clause	Requirement + Test	Result - Remark	Verdict

Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
--	--	--	--	--	--
Supplementary information:					

A (A)	**ANNEX A - 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 impendance device; touch current does not exceed 0,7 mA (peak) or 2 mA d.c. .....:		N/A
	Comply with Annex G of IEC 60598-1		N/A

B (B)	**Annex B - PARTICULAR REQUIREMENTS FOR THERMALLY PROTECTED LAMP CONTROLGEAR**		**N/A**
B.7	Marking		N/A
	- the symbol for "class P" thermally protected lamp controlgear		N/A
	- the symbol for temperature declared thermally protected lamp controlgear		N/A
B.8	Thermal endurance of windings		N/A
B.9	Lamp controlgear heating		N/A
B.9.1	Preselection test		N/A
B.9.2	“Class P” thermally protected lamp controlgear		N/A
B.9.3	Temperature declared thermally protected lamp controlgear as specified inIEC61347-2-8, with a rated maximum case temperature of 130°C or lower		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
B.9.4	Temperature declared thermally protected lamp controlgear as specifiedin IEC61347-2-8 with a rated maximum case temperature exceeding 130°C		N/A
B.9.5	Temperature declared thermally protected lamp controlgear as specified in IEC61347-2-9		N/A
C (C)	**ANNEX C – PARTICULAR REQUIREMENTS FOR ELECTRONIC LAMP CONTROLGEAR WITH MEANS OF PROTECTION AGAINST OVERHEATING**		**N/A**
(C3)	GENERAL REQUIREMENTS		N/A
(C3.1)	Thermal protection means integral with the convertor, protected against mechanical damage		N/A
	Renewable only by means of a tool		N/A
	If function depending on polarity, for cord-connected equipment protection means in both leads		N/A
	Thermal links comply with IEC 60691		N/A
	Electrical controls comply with IEC 60730-2-3		N/A
(C3.2)	No risk of fire by breaking (clause C7)		N/A
(C5)	CLASSIFICATION		N/A
	a) automatic resetting type		—
	b) manual resetting type		—
	c) non-renewable, non-resetting type		—
	d) renewable, non-resetting type		—
	e) other type of thermal protection; description ...:	Electronic circuit	N/A
(C6)	MARKING		N/A
(C6.1)	Symbol for temperature declared thermally protected ballasts		N/A
(C6.2)	Declaration of the type of protection provided		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
(C7)	LIMITATION OF HEATING		N/A
(C7.1)	Preselection test:		N/A
	Test sample placed for at least 12 h in an oven having temperature (t_c - 5) K		N/A
	No operation of the protection device		N/A
(C7.2)	Functioning of protection means:		N/A
	Normal operation of the sample in a test enclosure according to Annex D at an ambient temperature such that (t_c +0; -5) °C is obtained		N/A
	No operation of the protection device		N/A
	Introducing of the most onerous test condition determined during test of clause 14		N/A
	Output of windings connected to the mains supply short-circuited, and other part of the convertor operated under normal conditions		N/A
	Increasing of the current through the windings continuously until operation of the protection means		N/A
	Continuous measuring of the highest surface temperature		N/A
	Ballasts according to C5 a) or C5 e) operated until stable conditions are achieved		N/A
	Automatic-resetting thermal protectors working 3 times		N/A
	Ballasts according to C5 b) working 6 times		N/A
	Ballasts according to C5 c) and C5) d) working once		N/A
	Highest temperature does not exceed the marked value		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Any overshoot of 10% over the marked value within 15 min		N/A
D (D)	**ANNEX D – REQUIREMENTS FOR CARRY OUT THE HEATING TESTS OF THERMALLY PROTECTED LAMP CONTROLGEAR**		**N/A**
	Tests in C7 performed in accordance with Annex D, if applicable		N/A
E (E)	**ANNEX E – USE OF CONSTANT S OTHER THAN 4500 IN t_w TESTS**		**N/A**
	Comply with tests according Annex E		N/A
F (F)	**ANNEX F - DRAUGHT-PROOF ENCLOSURE**		**P**
	Draught-proof enclosure in accordance with the description		P
	Dimensions of the enclosure		P
	Other design; description		P
H (H)	**ANNEX H - TESTS**		**P**
	All tests performed in accordance with the advice given in Annex H, if applicable		P
I (L)	**ANNEX I: PARTICULAR ADDITIONAL REQUIREMENTS FOR SELV D.C. OR A.C. SUPPLIED ELECTRONIC CONTROLGEAR FOR LED MODULES**		N/A
(L.3)	Classification		N/A
	Class I	Yes ☐ No ☐	—
	Class II	Yes ☐ No ☐	—
	Class III	Yes ☐ No ☐	—
	non-inherently short circuit proof controlgear	Yes ☐ No ☐	—
	inherently short circuit proof controlgear	Yes ☐ No ☐	—

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Clause	Requirement + Test	Result - Remark	Verdict
	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		N/A
	Comply with 9.2 of IEC 61558-1		N/A
(L.6)	Heating		N/A
	No excessive temperatures in normal use		N/A
	Value if capacitor t_c marked ..... :		—
	Winding insulation classified as Class ..... :		—
	Comply with tests of clause 14 of IEC 61558-1 with adjustments		N/A
(L.7)	Short-circuit and overload protection		N/A
	Comply with tests of clause 15 of IEC 61558-1 with adjustments		N/A
(L.8)	Insulation resistance and electric strength		N/A
(L.8.1)	Conditioned 48 h between 91 % and 95 %		N/A
(L.8.2)	Insulation resistance		N/A
	Between input- and output circuits not less than 5 MΩ ..... :		N/A
	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
	between LV parts and functional earthing parts		N/A
(L.8.3)	Electric strength		N/A
	1) Between live parts of input circuits and live parts of output circuits ..... :		N/A
	2) Over basic or supplementary insulation between:		N/A
	a) live parts having different polarity ..... :		N/A

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

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IEC 61347-2-13:2014+A1:2016			
Clause	Requirement + Test	Result - Remark	Verdict
	Required distance (mm) .....:		—
	Measured (mm) ..... :		N/A
	Supplementary information		—
(N)	**ANNEX N: REQUIREMENTS FOR INSULATION MATERIALS USED FOR DOUBLE OR REINFORCED INSULATION**		N/A
(N.4)	General requirements		N/A
(N.4.1)	Material comply with IEC 60085 and IEC 60216 series		N/A
(N.4.2)	Solid insulation		N/A
	Electric strength test at least 5 kV or 1,35 x test voltage in Table N.1		N/A
	If not classified according IEC 60085 and IEC 60216 series: Electric strength test increased 10 % of 5,5 kV or 1,5 x test voltage in Table N.1		N/A
(N.4.3)	Thin sheet insulation		N/A
(N.4.3.1)	Thickness and composition of thin sheet insulation		N/A
	- Inside the ballast and not subjected to handling or abrasion during the production and during maintenance		N/A
	- Non-separated layers: Min. 3 layers and fulfil mandrel test of 150N		N/A
	- Separated layers: Min. 2 layers and each layer fulfil mandrel test of 50N		N/A
	- Separated layers (alternative): Min. 3 layers and 2/3 of the layers fulfil mandrel test of 100N		N/A
(N.4.3.2)	Mandrel test (electric strength test during mechanical stress)		N/A
	Electric strength test after mandrel test:		N/A
	- Non-separated layers: min. 5 kV or 1,35 x test voltage in Table N.1		N/A

Attachment No.5

IEC 61347-2-13:2014+A1:2016			
Clause	Requirement + Test	Result - Remark	Verdict
	- 2/3 of min. 3 separated layers: min. 5 kV or 1,25 x test voltage in Table N.1	5 kV	N/A
	- one of 2 separated layers: min. 5 kV or 1,25 x test voltage in Table N.1		N/A
	No flashover or breakdown occurred		N/A
(O)	**ANNEX O: ADDITIONAL REQUIREMENTS FOR BUILT-IN ELECTRONIC CONTROLGEAR WITH DOUBLE OR REINFORCED INSULATION**		N/A
(O.6)	Marking		N/A
	Marking according clause 7 (7)	See clause 7	N/A
	Special symbol		N/A
	Meaning of the special symbol explained in catalogue		N/A
(O.7)	Protection against accidental contact with live parts		N/A
	Requirements of clause 8 (10)	See clause 8	N/A
	Test finger not possible to make contact with basic insulated metal parts		N/A
(O.8)	Terminals		N/A
	Clause 9 (8)	See clause 9	N/A
(O.9)	Provision for earthing		N/A
	Functional earthing terminals comply with clause 9 of part 1		N/A
	No protective earthing terminal		N/A
(O.10)	Moisture resistance and insulation		N/A
	Clause 11 (11)	See clause 11	N/A
(O.11)	Electric strength		N/A
	Clause 12 (12)	See clause 12	N/A
(O.13)	Fault conditions		N/A
	Clause 14 (14)	See clause 14	N/A

Attachment No.5

IEC 61347-2-13:2014+A1:2016			
Clause	Requirement + Test	Result - Remark	Verdict
	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 17 (15)	See clause 17	N/A
	Accessible metal parts insulated from live parts by double or reinforced insulation		N/A
	Live part insulated from supporting surface in contact with external faces by double or reinforced insulation		N/A
(O.15)	Creepage distances and clearances		N/A
	Clause 18 (16)	See clause 18	N/A
	Comply with corresponding values for luminaries in IEC 60598-1		N/A
(O.16)	Screws, current-carrying parts and connections		N/A
	Clause 19 (17)	See clause 19	N/A
(O.17)	Resistance to heat and fire		N/A
	Clause 20 (18)	See clause 20	N/A
(O.18)	Resistance to corrosion		N/A
	Clause 21 (19)	See clause 21	N/A
(P)	**Creepage distances and clearances and distance through isolation (DTI) for lamp controlgear which are protected against pollution by the use of coating or potting**		N/A
(P.1)	**General**		N/A

Attachment No.5

IEC 61347-2-13:2014+A1:2016			
Clause	Requirement + Test	Result - Remark	Verdict
	P.2 applies if creepage distances less than the minimum in Table 7 and 8		N/A
	P.3 applies if clearance less than the minimum in Table 9, 10 and 11		N/A
(P.2)	**Creepage distances**		N/A
(P.2.2)	Minimum creepage distances for working voltages and rated voltages with frequencies up to 30 kHz (Table P.1)		N/A
	Basic or supplementary insulation:		N/A
	Required creepage.....:	--	—
	Measured.....:	--	N/A
	Supplementary information		—
	Reinforced insulation:		N/A
	Required creepage.....:	--	—
	Measured.....:	--	N/A
	Supplementary information		—
(P.2.3)	Creepage distances for working voltages with frequencies above 30 kHz (Table P.2)		N/A
	Voltage $\hat{U}_{out}$ kV .....:	--	—
	Frequency.....:	--	—
	Required distance..... :	--	—
	Measured.....:	--	N/A
	Supplementary information		—
(P.2.4)	Compliance with the required creepage distances		N/A
(P.2.4.1)	Compliance in accordance with 16.3.3 and test according P.2.4.2		N/A
(P.2.4.3)	Electrical tests after conditioning		N/A
(P.2.4.3.1)	Insulation resistance and electric strength according Clause 11 and 12		N/A
(P.3)	**Distance through isolation**		N/A

Attachment No.5

IEC 61347-2-13:2014+A1:2016			
Clause	Requirement + Test	Result - Remark	Verdict
(P.3.4)	Electrical tests after conditioning		N/A
(P.3.4.1)	Insulation resistance and electric strength according Clause 11 and 12		N/A
(P.3.4.2)	Impulse voltage dielectrical test		N/A
	Basic or supplementary insulation:		N/A
	Working/rated voltage .....:	--	—
	Impulse voltage.....:	--	N/A
	Supplementary information		—
	Reinforced insulation:		N/A
	Working/rated voltage .....:	--	—
	Impulse voltage.....:	--	N/A
	Supplementary information		—

Attachment No.6

AS/NZS 61347.1:2016+A1:2018+Rule1:2020			
Clause	Requirement + Test	Result - Remark	Verdict
APPENDIXZZ	**VARIATIONS TO IEC 61347-1 ED.3.0 (2015) FOR APPLICATION IN AUSTRALIA AND NEW ZEALAND (AS/NZS 61347.1:2016+A1:2018+Rule1:2020)**		**P**
(1)	**SCOPE**		**P**
	At the end of Clause 1, add the following text: Where the term lamp is used within this standard it is taken to include electric light sources. LED light sources are to be subject to the same test parameters as “other discharge lamps”.		—
	Amendment 1 specifies additional safety requirements for independent lamp controlgear to provide adequate protection in respect of the fire risk associated with the combination of independent lamp controlgear used with recessed luminaires, flammable building elements, flammable debris and building insulation.		—
	Add the following new normative references: AS 60529, Degrees of protection provided by enclosures (IP Code) AS/NZS 3191, Electric flexible cords AS/NZS 4859.1, Materials for the thermal insulation of buildings—General criteria and technical provisions AS/NZS 60695.2.11, Fire hazard testing — Part 2.11: Glowing/hot-wire based test methods—Glow-wire flammability test method for end-products AS/NZS 60695.11.10, Fire hazard testing — Part 11.10: Test flames —50 W horizontal and vertical flame test methods IEC 61048, Auxiliaries for lamps — Capacitors for use in tubular fluorescent and other discharge lamp circuits — General and safety requirements AS/NZS 61049, Auxiliaries for lamps — Capacitors for use in tubular fluorescent and other discharge lamp circuits — Performance requirements AS/NZS 61347, Lamp controlgear (all parts) AS/NZS 61535, Installation couplers		—
(3)	**TERMS AND DEFINITIONS**		**P**
(3.1.2)	Add: Independent lamp controlgear includes lamp controlgearpermanently connected and lamp controlgear able to bedisconnected from the light source. Independent lamp controlgearable to be disconnected are considered “separate to the luminaire”. NOTE *Separate excludes cutting connection wires.* Hereafter, “lamp controlgear” will be shown as		—

Attachment No.6

AS/NZS 61347.1:2016+A1:2018+Rule1:2020			
Clause	Requirement + Test	Result - Remark	Verdict
	"controlgear".		
(3.101)	Do-not-cover classification An independent controlgearthat can be used where normallyflammable materials, including building insulation, are or may bepresent, but cannot be abutted against any material and cannot becovered in normal use.		—
(3.102)	IC classification An independent controlgear that can be abutted against normallyflammable materials, including building insulation, and can be covered in normal use. Building elements, building insulation ordebris have restricted access to the heated parts of the controlgear.		—
(3.103)	Non IC classification An independent controlgear that cannot be abutted against orcovered by normally flammable materials or used in installationswhere building insulation or debris is, or may be, present in normaluse. NOTE *This classification is not suitable for residential installations.*		—
(4)	**GENERAL REQUIREMENTS**		**P**
	After the fourth paragraph, add the following new Note: NOTE Test conditions and marking requirements for independent controlgear, for use with building insulation or flammable surfaces, for example when used with recessed luminaires, are under consideration.		—
(4.101)	Supply connection wiring		P
	Independent lamp controlgear shall be provided with only one of the following means of connection to the LV supply.		—
	–Means of connection.....: a) Device for the connection of controlgears b) Terminals c) Connecting lead (tails) d) Supply cord and plug e) Adaptor for engagement with supply tracks f) Appliance inlet or inlet plug g) Installation coupler		N/A

Attachment No.6

AS/NZS 61347.1:2016+A1:2018+Rule1:2020			
Clause	Requirement + Test	Result - Remark	Verdict
	h) Luminaire coupler i) Integral pins for insertion into socket outlets		
	In Australia, equipment with a supply cord shall be fitted with a plug complying with AS/NZS 3112 or a coupler complying with its standard. However for other than controlgear supplying portable luminaire a plug is not required if the controlgear is marked with a cord tag with the symbol for “must be installed by a licensed electrician” in accordance with AS/NZS 60598.1.	 FIGURE ZZ1 MUST BE INSTALLED BY A LICENSED ELECTRICIAN	N/A
(4.102)	General		N/A
	The resistance to dust and solid object provisions of Section 9of AS/NZS 60598.1 apply, excluding the humidity test, along with the following:		—
	a) For independent controlgear with an IP classification greater than IP20, the tests and compliance criteria of Section 9 of AS/NZS 60598.1 shall be applied.		N/A
	b) For independent controlgear with an IC classification, the IP4X probe or IP rating tests of Clause 4.103 and compliance shall be applied.		N/A
(4.103)	Ingress test for IC classified controlgear		N/A
	Solid foreign objects shall have restricted access to the hot surfaces of IC classified controlgear. The IP4X probe of AS 60529 shall be applied to the controlgear without appreciable force and shall not enter any area where the temperature of any part or surface exceeds the temperature limit for ‘mounting surface: normally flammable surface’ of AS/NZS 60598.1, when the surface is measured while the controlgear is operated in accordance with the thermal test conditions of Paragraph ZA1. NOTE *This test is intended to ensure fine flammable insulation material or debris is unlikely to enter controlgear and cause a fire.*		N/A
(5)	**GENERAL NOTES ON TESTS**		**P**
(5.101)	Controlgear voltage		P
	In Australia, for equipment other than Class III equipment, intended for connection to the a.c. supply mains, and that are not marked with: – a rated voltage of at least 240 V for single-phase equipment or a rated voltage of at least 415 V for three-phase equipment; or		P

Attachment No.6

AS/NZS 61347.1:2016+A1:2018+Rule1:2020			
Clause	Requirement + Test	Result - Remark	Verdict
	– a rated voltage range that includes 240 V for single-phase equipment and 415 V for three-phase equipment, The rated supply voltage and the upper limit of the voltage range is 240 V/415 V.		
(5.102)	Independent controlgear for use near or in contact with building material or insulation		N/A
	Independent controlgear shall be—		—
	a) classified, marked and tested for suitability for use near building materials or insulation and classified “Do not Cover”, or		N/A
	b) classified, marked and tested for suitability for use in contact with building materials and coverable with insulation, and classified as “IC”.		N/A
(5.103)	Thermal tests for “Do-not-Cover” classified controlgear		N/A
(5.103.1)	“Do not-Cover” controlgear, normal operation test		N/A
	Controlgear classified as “Do not Cover” shall be tested in accordance with the requirements of Clause 5.5.		N/A
(5.103.2)	“Do-not-Cover” classified controlgear, abnormal operation test		N/A
	Controlgear classified as “Do not Cover” shall be tested in accordance with the requirements of Paragraph ZA3. When the “Do not Cover” controlgear is tested in accordance with Paragraph ZA3, no temperature shall exceed—		N/A
	- a)mounting surface(°C)..... :	Limit: 90 °C	N/A
	- b) outer surface of the controlgear(°C)..... :	Limit: 130 °C	N/A
	During and after normal operation:		N/A
	- no damage to the controlgear such as scorching, deformation ormelting		N/A
	- no thermal protection device operate		N/A
	- no electronic control operate		N/A
(5.104)	Thermal tests for “IC” controlgear		N/A
	Controlgear classified as “IC” shall be tested in accordance with the requirements of Paragraph ZA3.		N/A

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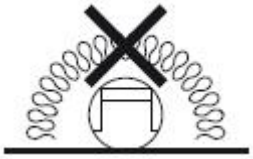
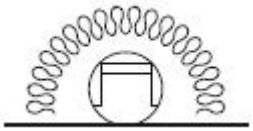
AS/NZS 61347.1:2016+A1:2018+Rule1:2020			
Clause	Requirement + Test	Result - Remark	Verdict
	When the “IC” controlgear is tested in accordance with Paragraph ZA3, no temperature shall exceed—		
	a)the controlgear mounting surface (°C).....:	See annex 4; Limit: 90 °C	N/A
	b) the lesser of t_c or 90 °C on the outside surface of the controlgear or other places accessible to the relevant test probe of Clause 4.103. (°C)..... :	See annex 4; Limit:t_c/90 °C	N/A
	During and after normal operation:		N/A
	- no damage to the controlgear such as scorching, deformation or melting		N/A
	- no thermal protection device operate		N/A
	- no electronic control operate		N/A
(6)	**Classification**		N/A
(6.101)	Independent controlgear shall be classified as:	☐ Do-not-cover ☐ IC ☐ Non-IC	N/A
(7)	**MARKING**		N/A
(7.1)	Language of instructions shall in English		N/A
	The information provided shall contain details related to components in controlgear requiring replacement as part of a maintenance program.		N/A
	FELV control terminals shall be marked with the warning symbol “Risk of electric shock”. 		N/A
	Instructions shall be provided with controlgear that have FELV control terminals that state the following:		—
	–WARNING: FELV terminals marked “Risk of electric shock” are not safe to touch.		N/A
	–WARNING: Circuits connected to any FELV control terminal shall be insulated for the LV supply voltage of the controlgear and any terminals connected to the FELV circuit shall be protected against accidental contact.		N/A
(7.101)	Controlgear classification symbol		N/A
	Independent controlgear shall be marked with the symbol shown in the appropriate figure of this		N/A

Attachment No.6

AS/NZS 61347.1:2016+A1:2018+Rule1:2020			
Clause	Requirement + Test	Result - Remark	Verdict
	clause and the meaning explained in the instructions provided with the controlgear.		
	Controlgear classified as “Non IC” does not require to be marked.		N/A
	Controlgear classified as “Do not Cover” shall be marked with the symbol 		N/A
	Controlgear classified as “IC” shall be marked with the symbol 		N/A
	NOTE *The independent controlgear symbol and the symbol for “Do not Cover” and “IC” can be combined to be represented as shown above.*		—
(7.102)	Additional information to be supplied with the controlgear		N/A
	“Do-not-cover” and “Non-IC” classified controlgear shall be supplied with instructions and diagrams showing all dimensions for safe installation and include, as appropriate, the following:		N/A
	a) The minimum clearance distance from the top and sides of the controlgear to normally flammable building elements (mm)……..:		N/A
	b) If the minimum clearance distances from each side of the controlgear are different, then each minimum clearance distance shall be stated separately (mm)……..…:		N/A
	b) If there are different minimum clearance distances for various types of normally flammable building element or building insulation, then each minimum clearance distance shall be stated separately (mm)……..:		N/A
	c) Where controlgear is required to be mounted on a specific surface or has additional installation requirements, the relevant information shall be		N/A

Attachment No.6

AS/NZS 61347.1:2016+A1:2018+Rule1:2020			
Clause	Requirement + Test	Result - Remark	Verdict
	supplied with the controlgear. NOTE *Installation in a non-combustible enclosed space may include installation in a rebate in a concrete slab, ceiling or wall.*		
(7.103)	Independent controlgear		N/A
	For independent controlgear not supplied with, but intended for use with, a separate lamp or light source container or head, for example, a remote mounted floodlight, the instructions supplied shall specify the independent controlgear parameters for use by the luminaire assembler.		N/A
(7.104)	Location and durability of marking		N/A
	The marking required by Clause 7.101 shall bea minimum size of 5 mm × 5 mm		N/A
(7.105)	Compliance		N/A
	Compliance with Clauses 7.101 to 7.104 is checked by inspection.		N/A
(10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		**N/A**
(10.1)	For the purpose of this Clause, FELV circuits are considered a live part.		N/A
(15)	**CONSTRUCTION**		**P**
(15.101)	Power factor correction capacitors		P
	Power factor correction capacitors incorporated into controlgear shall be not less than Type B capacitors with metal body and break action protection in accordance with IEC 61048 and AS/NZS 61049. A capacitor complying with ANCI/EIA-456-A shall comply with AS/NZS 61049 and IEC 61048:2006, excluding the endurance test.		N/A
	In addition capacitors shall have a minimum voltage rating of 250 V at temperature rating of 85 °C or 280 V at temperature rating of 100 °C.		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**		**P**
(18.2.1)	Parts of non-metallic material shall be resistant to flame and ignition.		P
	For materials other than ceramic, compliance is checked by the test of sub clauses 18.2.2, 18.2.3,		P

Attachment No.6

AS/NZS 61347.1:2016+A1:2018+Rule1:2020			
Clause	Requirement + Test	Result - Remark	Verdict
	18.2.4 and 18.2.5 as appropriate.		
	This requirement does not apply to decorative trims, knobs, wiring insulation and other parts not likely to be ignited or to propagate flames from inside the controlgear.		—
	This Clause applies to all parts, including components, even if they have been tested to their own standard		—
(18.2.2)	Parts of non-metallic material supporting connections shall withstand glow-wire test 750 °C.	See table (18.2) of IEC 61347-2-13 part	P
(18.2.3)	All other parts of non-metallic material shall withstand glow-wire test 650°C.	See table (18.2) of IEC 61347-2-13 part	P
(18.2.4)	During the application of the glow-wire tests of sub clauses 18.2.2 and 18.2.3, if the duration of the produced flames are ≥ 2s, the non-metallic parts that encroach within the envelope of a vertical cylinder having a diameter of 20 mm and a height of 50 mm above the point of application of the glow wire are subjected to the needle-flame test.		N/A
(18.2.5)	PCBs which other than V-0 classification in controlgear shall be subject to the needle-flame test of AS/NZS 60695.11.5.	V-0	N/A
	The needle flame is applied to one test sample for 30 s to an edge of the PCB at least 10 mm from a corner.		—

Attachment No.7

AS 61347.2.13:2018			
Clause	Requirement + Test	Result - Remark	Verdict
4 (4)	**GENERAL REQUIREMENTS**		N/A
	Compliance of independent controlgear enclosure with EN 60598- 1		N/A
	Independent SELV controlgear comply with Annex I	(see Annex I)	N/A
	Where the controlgear has accessible outputs, the controlgear shall be SELV output and comply with Annex I.		N/A
	SELV equivalent is not permitted where controlgear has accessible outputs or is classified as independent SELV		N/A
8 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		N/A
8.2	Exposed terminals of SELV controlgear if: the rated or maximum rated output voltages ≤ 25 V r.m.s or 60 V d.c. ripple-free d.c.		N/A
	If the voltage exceeds 25 V r.m.s. or 60 V ripple-free d.c. the touch current shall not exceed: – for a.c.: 0,7 mA (peak); – for d.c.: 2,0 mA; the no-load output voltage ≤ 33 √2 V peak or 60 V d.c. ripple-free d.c.		—
	- touch current .....:		N/A
	- no-load voltage.....:		N/A
	Insulated terminals if convertor with rated output voltage > 25 V or 60 V d.c. ripple-free d.c.		N/A
	One capacitor Y1 or two capacitors Y2 complying with IEC 60384-14 of the same values used in series between SELV or SELV-equivalent output and primary circuits		N/A
	Other components bridging the separating transformer complying with IEC 60065, clause 14		N/A

Attachment No.7

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

Attachment No.8

Photo documentation

Model: RAVOLI2400A

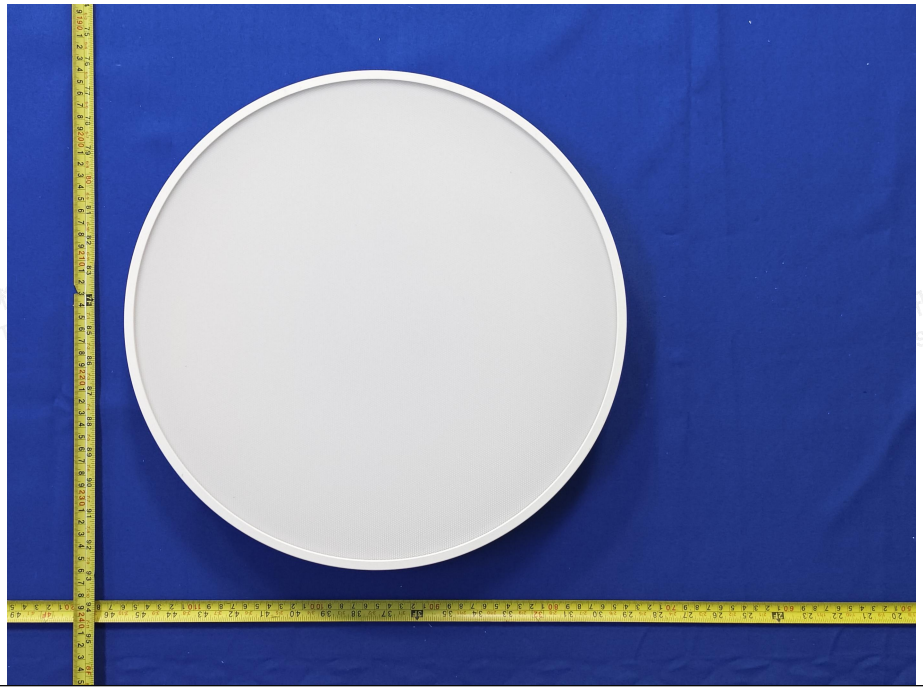


Photo 1

Photo 2

Attachment No.8

Photo documentation

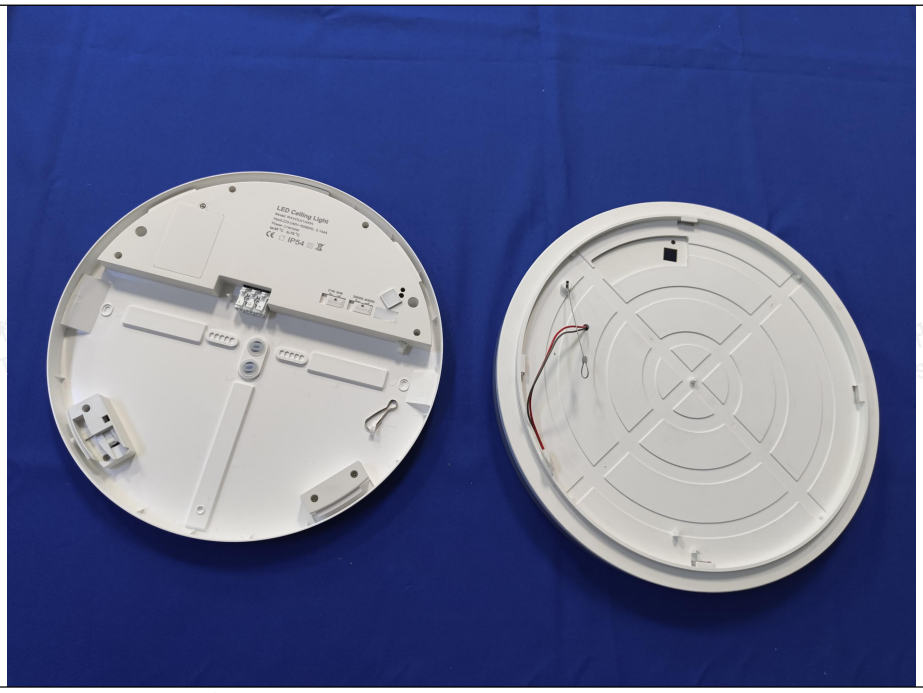


Photo 3(the mounting plate can not remove only by hand)

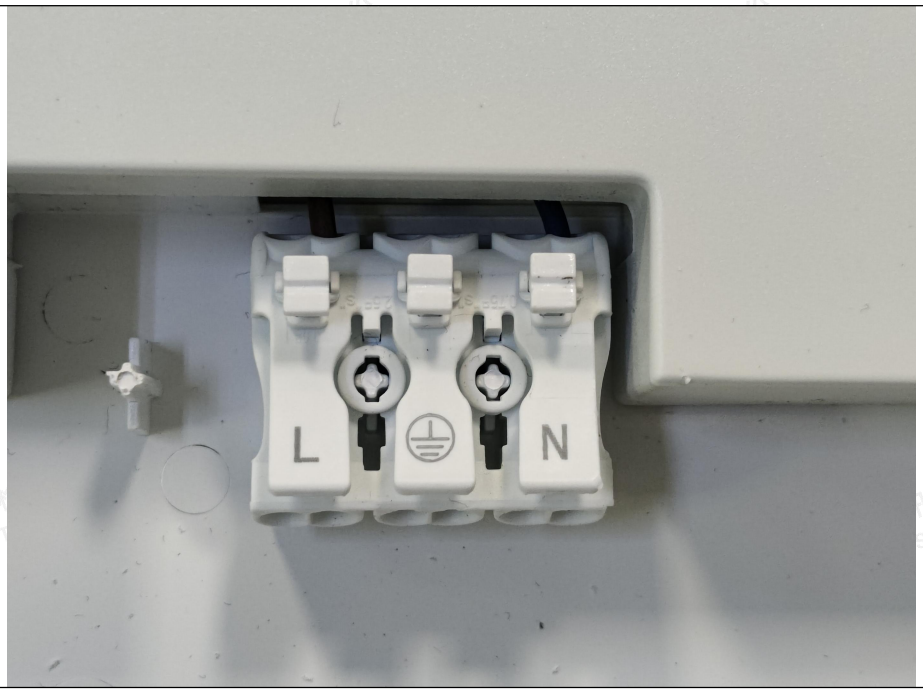


Photo 4

Attachment No.8

Photo documentation

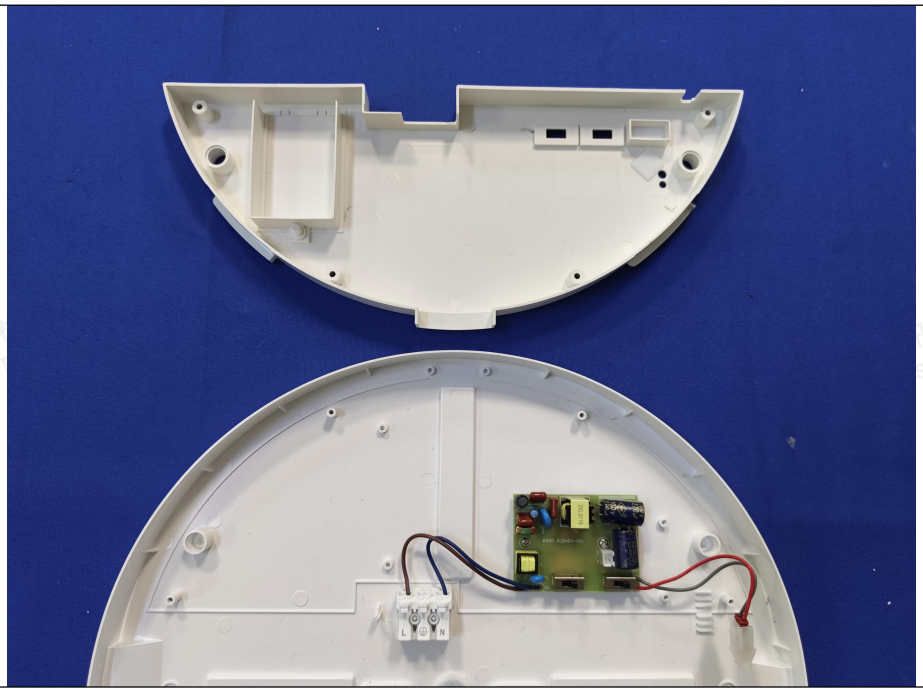


Photo 5

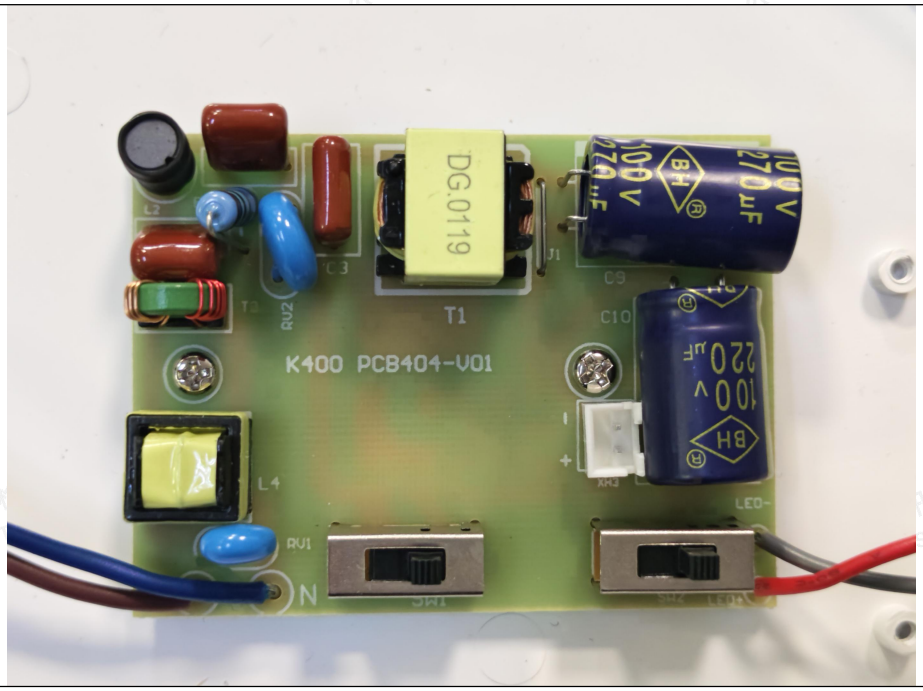


Photo 6(LED driver)

Attachment No.8

Photo documentation

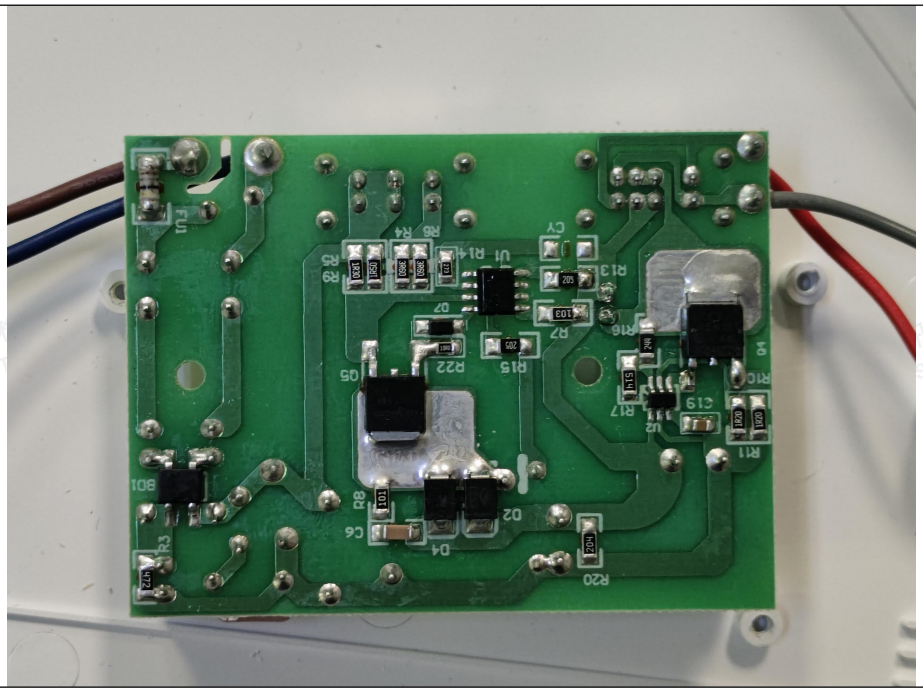


Photo 7

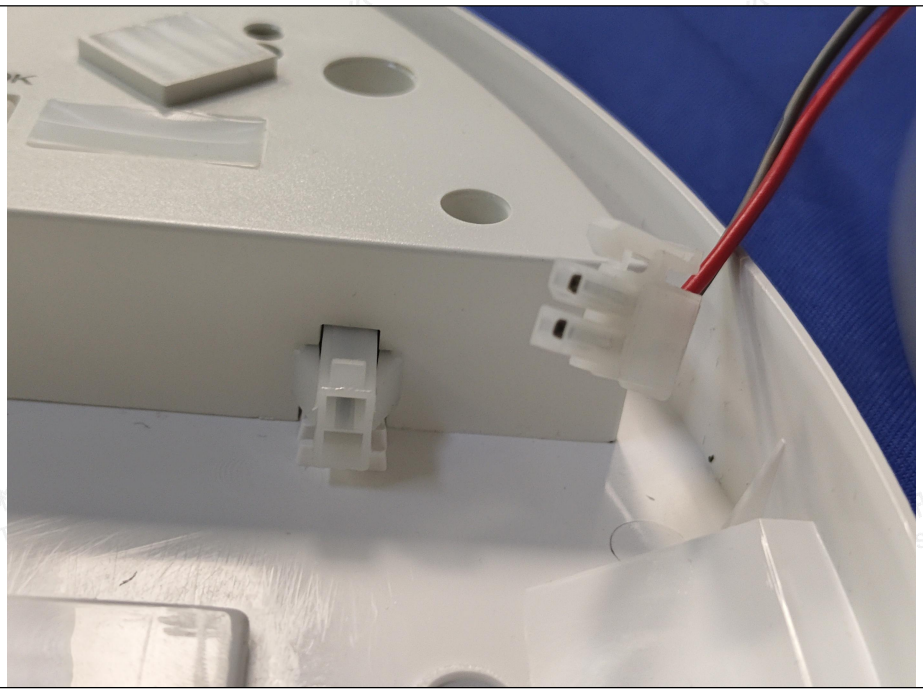


Photo 8

Attachment No.8

Photo documentation

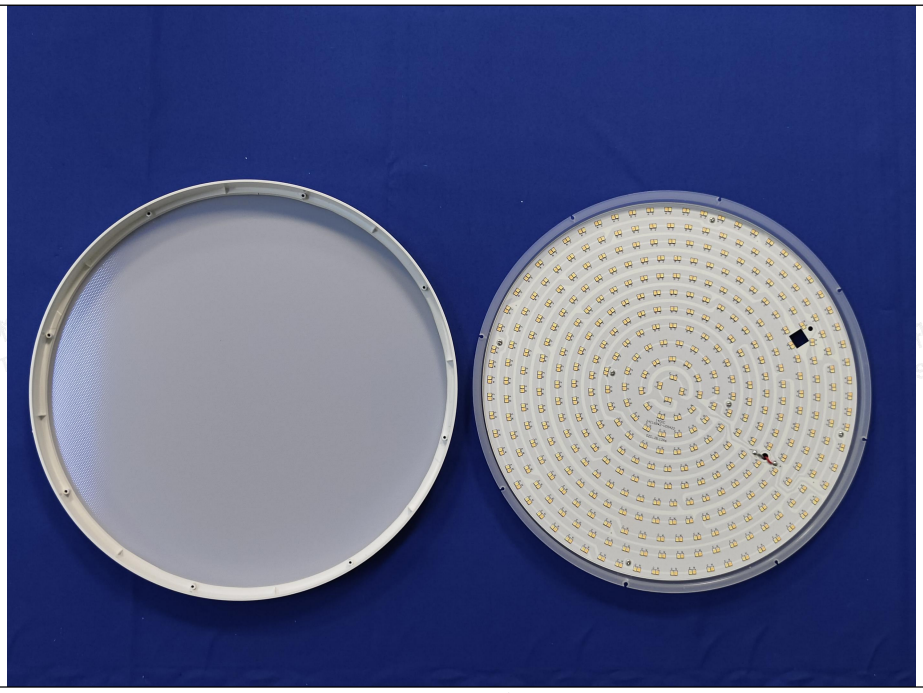


Photo 9

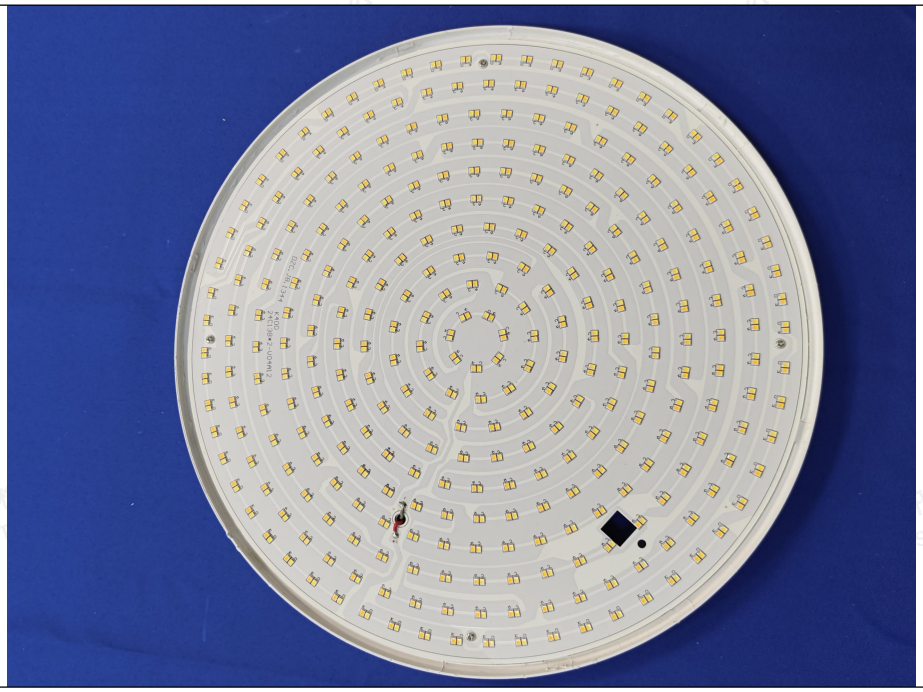


Photo 10

Attachment No.8

Photo documentation

Model: RAVOLK1400A

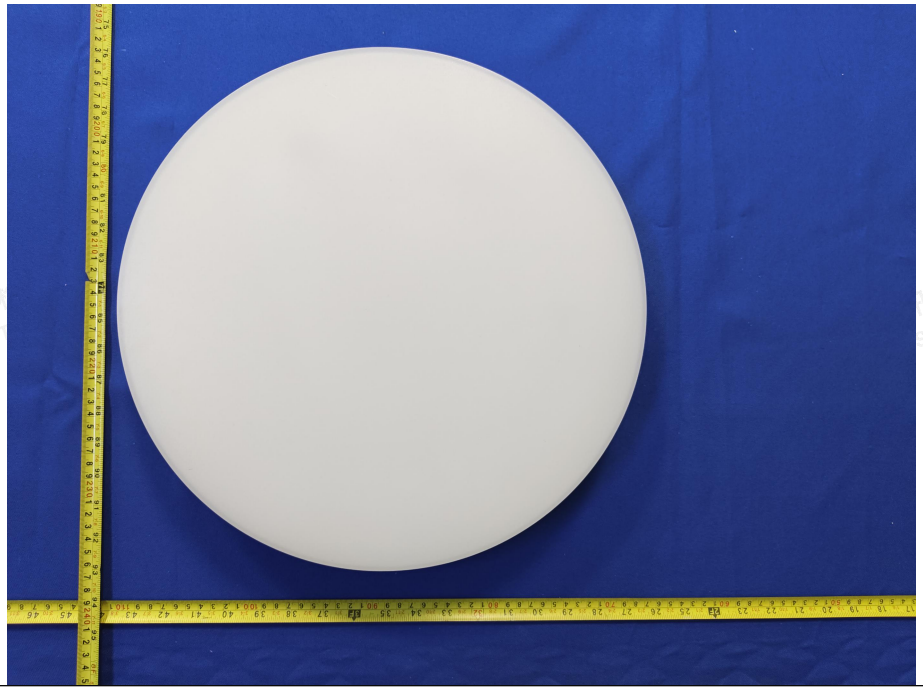


Photo 11

Photo 12

Attachment No.8

Photo documentation

Photo 13

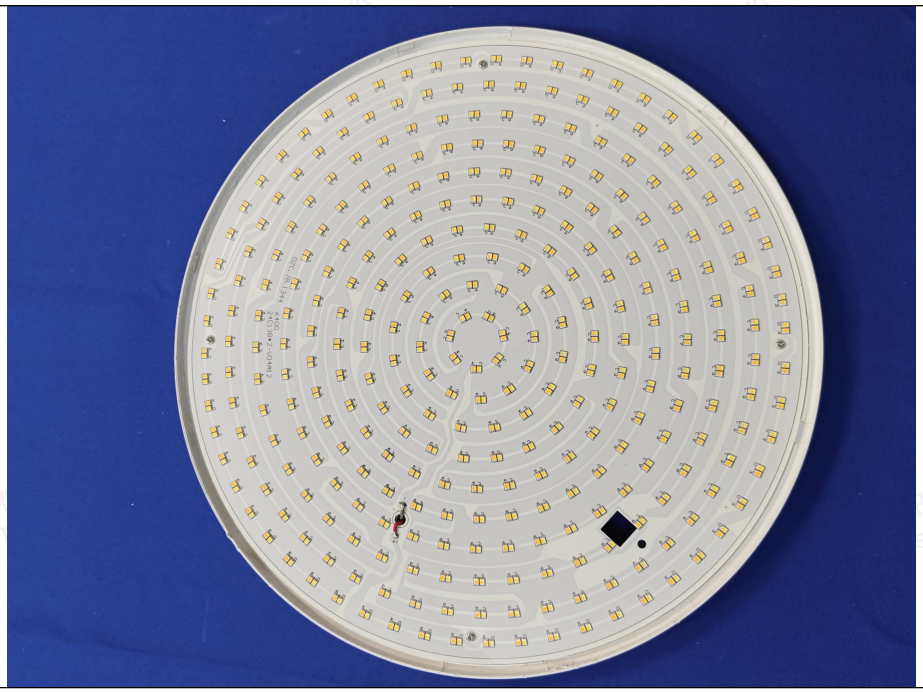


Photo 14

Attachment No.8

Photo documentation

Model: RAVOLI2400B

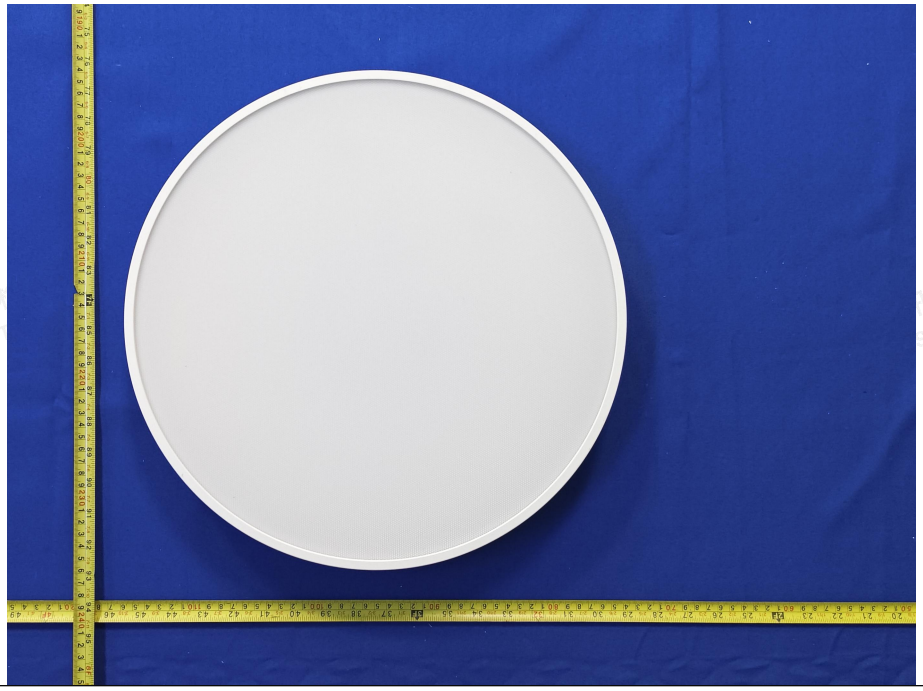


Photo 15

Photo 16

Attachment No.8

Photo documentation

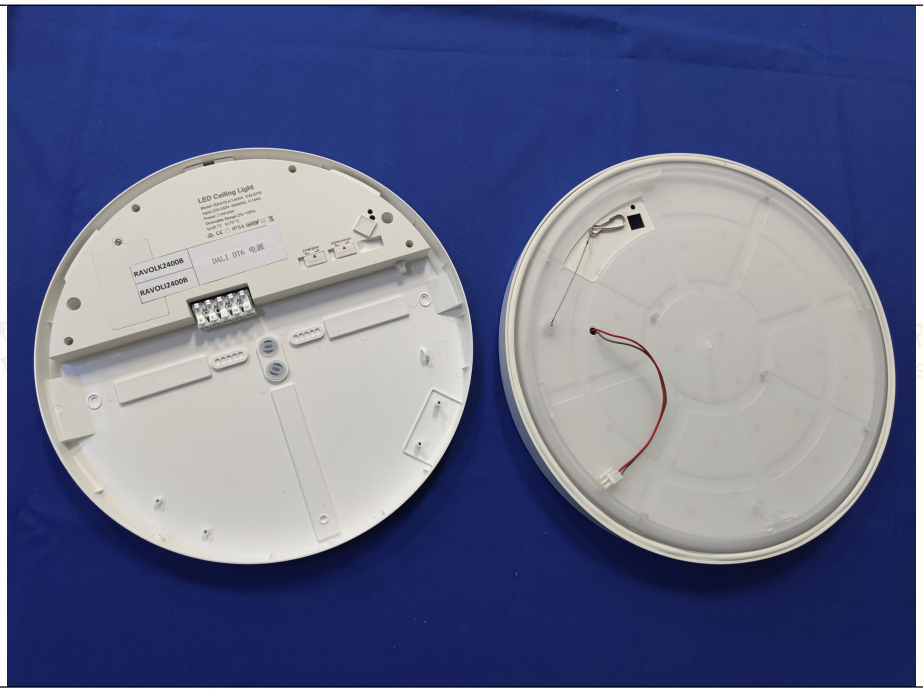


Photo 17(the mounting plate can not remove only by hand)

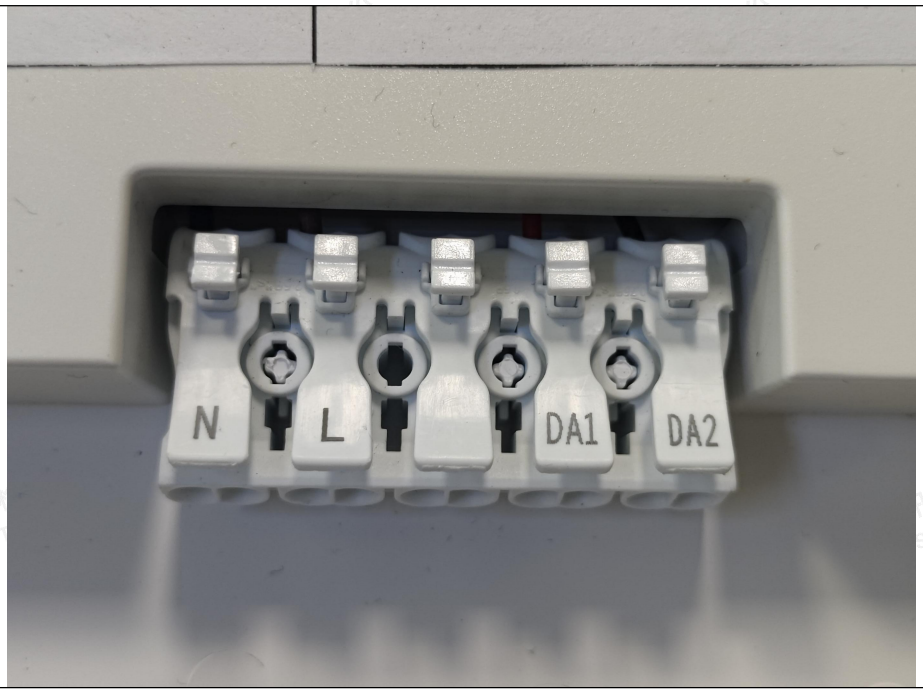


Photo 18

Attachment No.8

Photo documentation

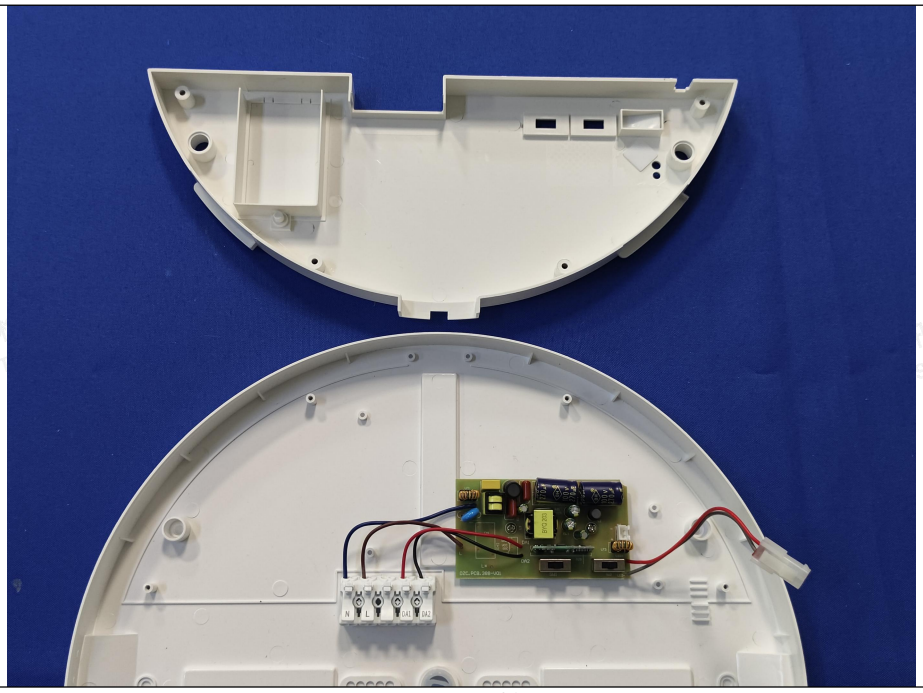


Photo 19

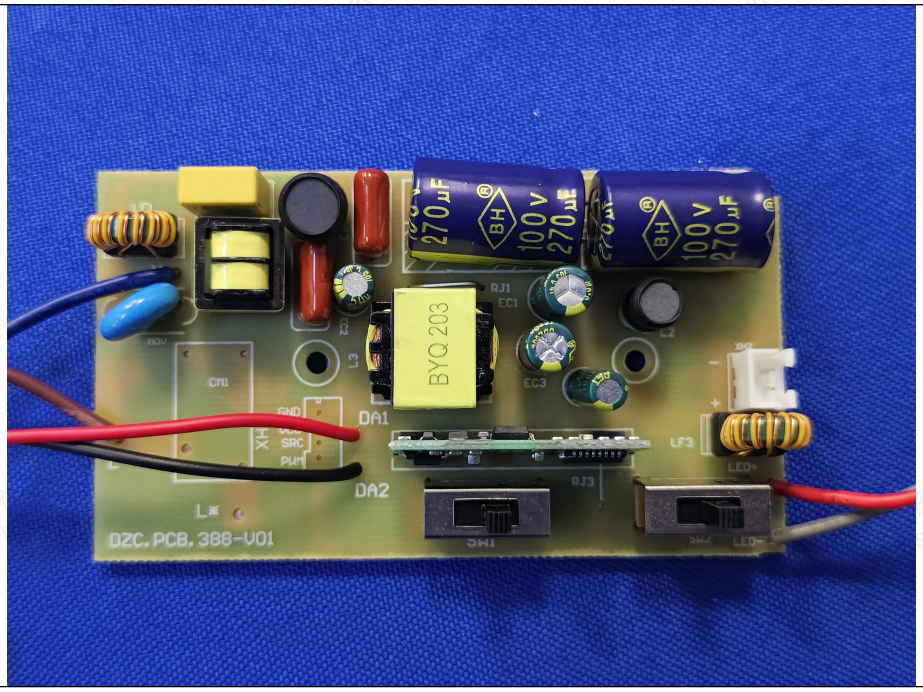


Photo 20(LED driver)

Attachment No.8

Photo documentation

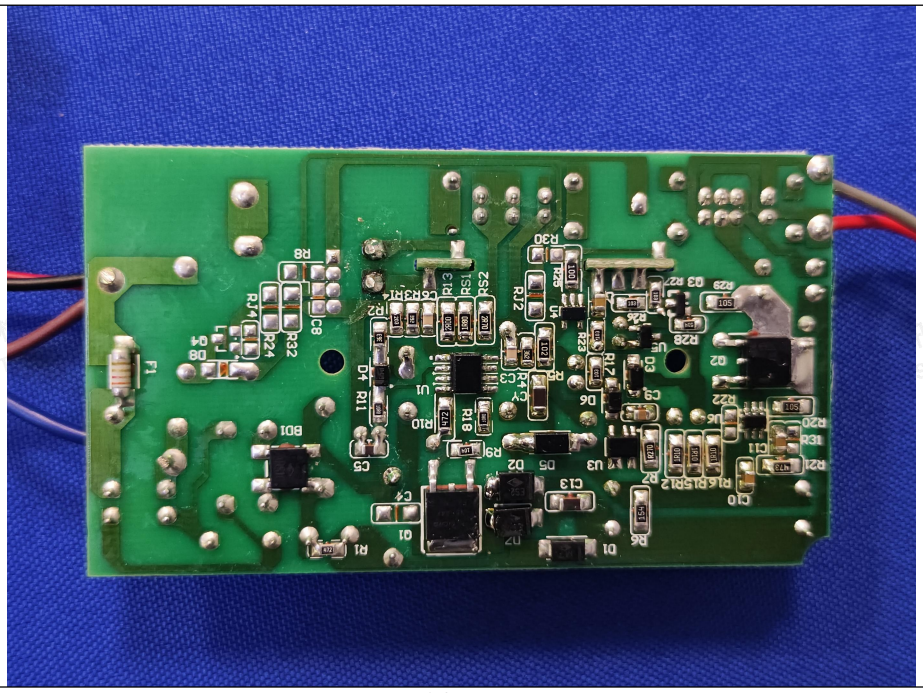


Photo 21(LED driver)

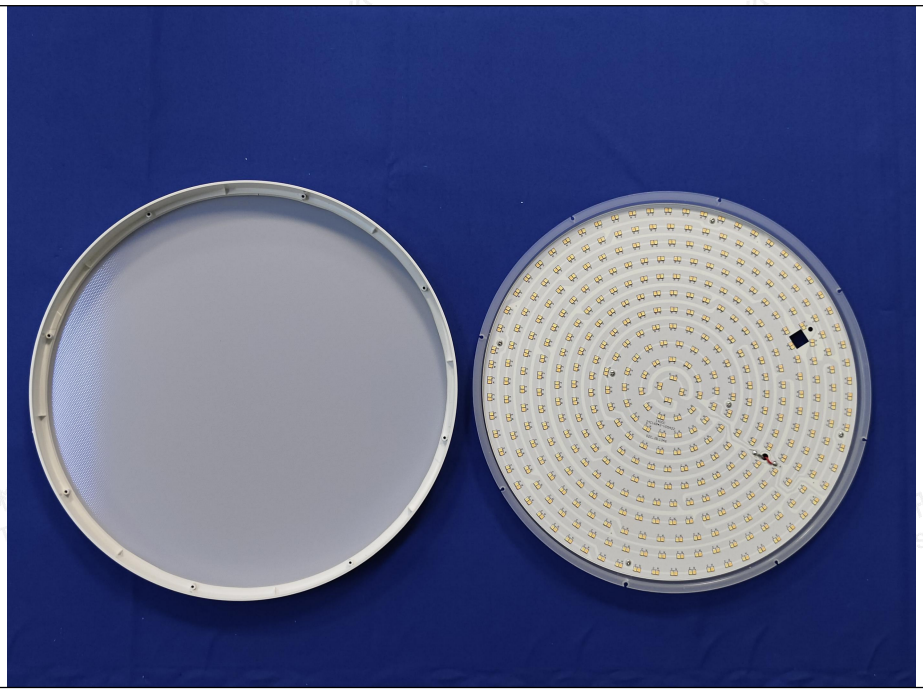


Photo 22

Shenzhen Southern LCS Compliance Testing Co., Ltd.
Add: Room 101-201, Building 39, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, Guangdong, China
Tel: +(86) 0755-29871520 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com
Scan code to check authenticity

Attachment No.8

Photo documentation

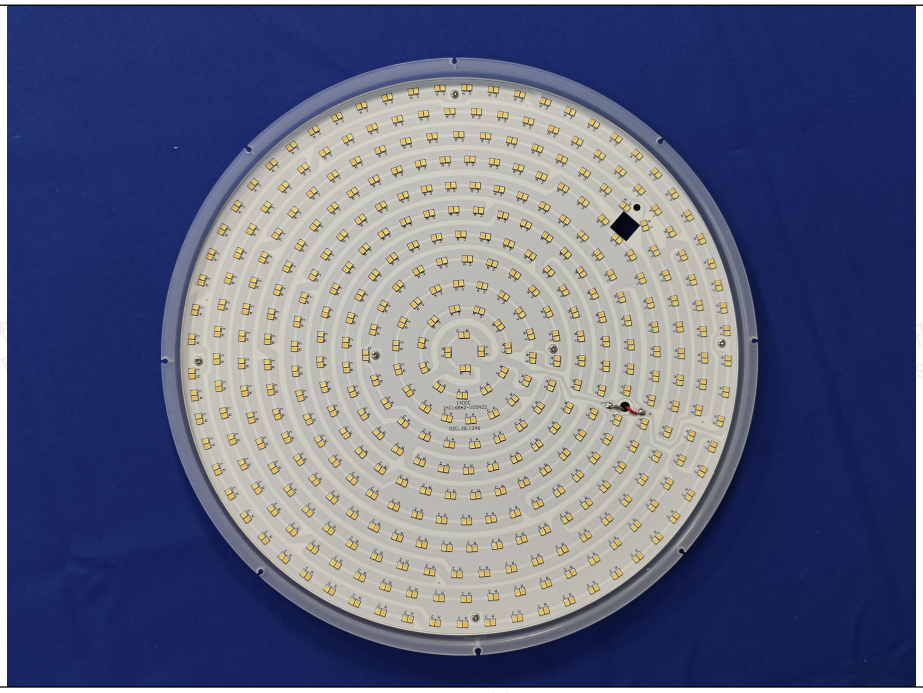


Photo 23

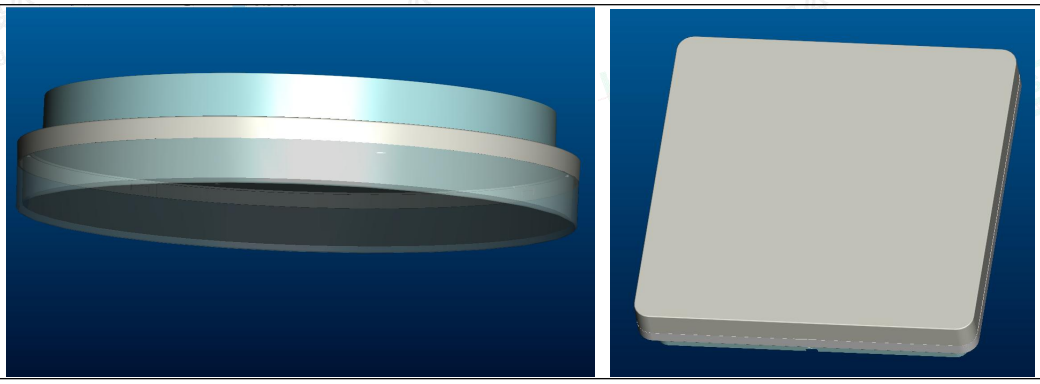


Photo 24(RAVOLK series--appearance of IP54 model)

Attachment No.8

Photo documentation

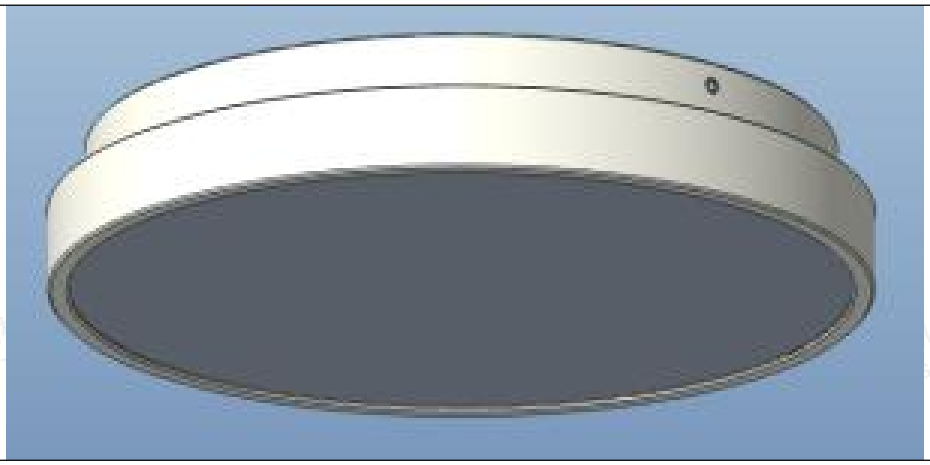


Photo 25(RAVOLI series--appearance of IP44 model)

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