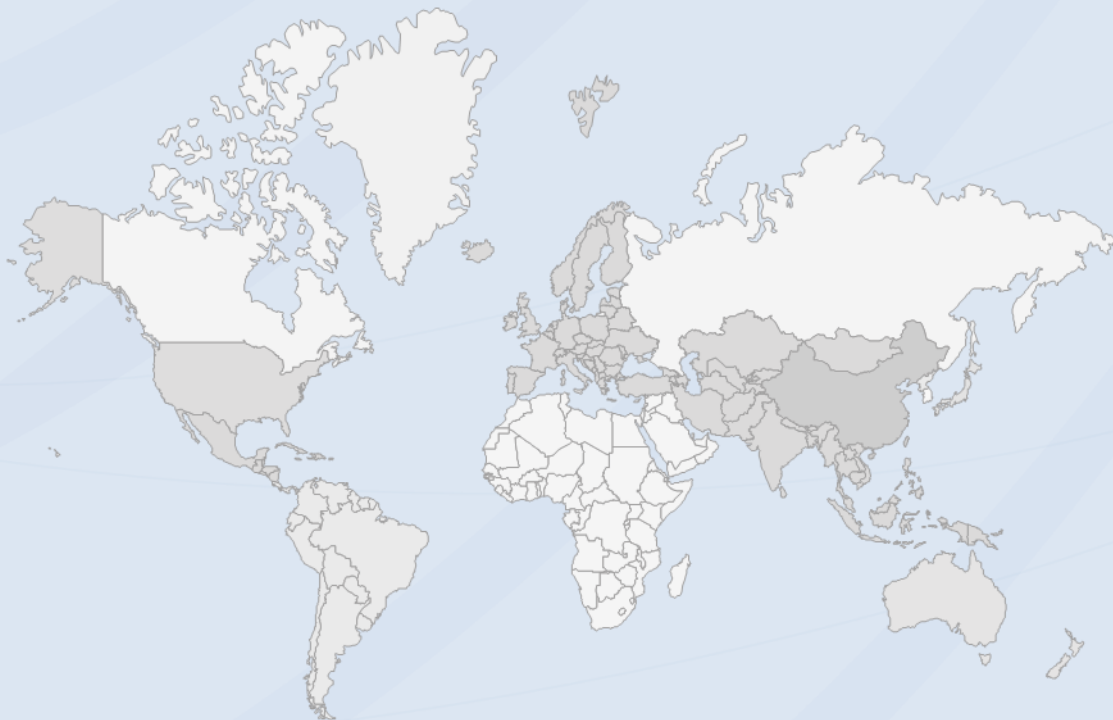


# SAFETY TEST REPORT

**Report No.**..... : NTC-SR2407015  
**Applicant's name** ..... : LEDlife ApS  
**Address** ..... : Nordkajen 5 6000 Kolding Denmark




## **DONGGUAN NEW TESTING CENTRE CO., LTD**

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

<b>Report Number</b> .....	NTC-SR2407015
<b>Date of issue</b> .....	August 22, 2024
<b>Total number of pages</b> .....	67 Pages
<b>Name of Testing Laboratory preparing the Report</b> .....	Dongguan New Testing Centre Co., Ltd 1F & 3F, No. 1 the 1st North Industry Road Songshan Lake Science & Technology Park Dongguan, People's Republic of China 523808
<b>Applicant's name</b> .....	LEDlife ApS
<b>Address</b> .....	Nordkajen 5 6000 Kolding Denmark
<b>Manufacturer's name</b> .....	Shenzhen opte lighting co ltd
<b>Address</b> .....	No108 Zhongxin Road Xinqiao Baoan District Shenzhen
<b>Test specification:</b>	
<b>Standard</b> .....	IEC 60598-2-1:2020 used in conjunction with IEC 60598-1:2020
<b>Test procedure</b> .....	Safety Test Report
<b>Non-standard test method</b> .....	N/A
<b>TRF template used</b> .....	IECEE OD-2020-F1:2021, Ed.1.4
<b>Test Report Form No</b> .....	IEC60598_2_1I
<b>Test Report Form(s) Originator</b> .....	Intertek Semko AB
<b>Master TRF</b> .....	Dated 2022-08-26
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<b>General disclaimer:</b>	
The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing NCB. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.	
<b>Test item description</b> .....	LED Tri-proof Light
<b>Trade Mark</b> .....	
<b>Model/Type reference</b> .....	Dura69.60CM.RA90.21W.WW; Dura69.60CM.150LM.21W.NW; Dura69.60CM.1-10V.21W.NW; Dura69.120CM.150LM.38W.NW; Dura69.120CM.RA90.38W.WW; Dura69.120CM.1-10V.38W.NW; Dura69.150CM.150LM.45W.CW; Dura69.150CM.150LM.45W.NW; Dura69.150CM.1-10V.RA90.45W.NW; Dura69.150CM.1-10V.RA90.45W.WW; Dura69.150CM.1-10V.50W.NW
<b>Ratings</b> .....	220-240V~, 50/60Hz, Max.50W; Class I; IP69K; ta: 40°C;

**Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):**

**Tested by (name + signature).....:** Jack Zhang



**Approved by (+ signature).....:** Neil Zhong



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

The complete report consists 67 pages;

**Attachment 1:**

European Group Differences and National differences according to EN IEC 60598-2-1:2021, totally 2 page;

**Attachment 2:**

Additional requirements for LED module according to IEC 62031:2018 and EN IEC 62031:2020, totally 1 page;

**Attachment 3:**

Blue light hazard to light sources and luminaires according to IEC/TR 62778:2014, totally 2 pages;

**Attachment 4:**

Test Report IEC 60598-2-24

**Attachment 5:**

Photo documentation, totally 6 pages;

**Summary of testing:**

1. All of testing according to these standards is type test.
2. Construction inspection for the model has been considered. Only the most unfavourable results are recorded in this report. The test samples are complying with the relevant product standards and all applicable tests in this test report.

**Tests performed (name of test and test clause):**

All of tests were conducted on model Dura69.150CM.1-10V.50W.NW at maximum loading condition, which was considered representative for the series and give the most unfavourable test results.

**Testing location:**

Dongguan New Testing Centre Co., Ltd  
1F & 3F, No. 1 the 1st North Industry Road Songshan Lake Science & Technology Park Dongguan, People's Republic of China 523808

**Summary of compliance with National Differences (List of countries addressed):**

**EU Group Differences**

**The product fulfils the requirements of EN IEC 60598-1:2021 (insert standard number and edition and delete the text in parenthesis, leave it blank or delete the whole sentence, if not applicable)**

**Use of uncertainty of measurement for decisions on conformity (decision rule) :**

No decision rule is specified by the IEC standard, when comparing the measurement result with the applicable limit according to the specification in that standard. The decisions on conformity are made without applying the measurement uncertainty ("simple acceptance" decision rule, previously known as "accuracy method").

Other:... (to be specified, for example when required by the standard or client, or if national accreditation requirements apply)

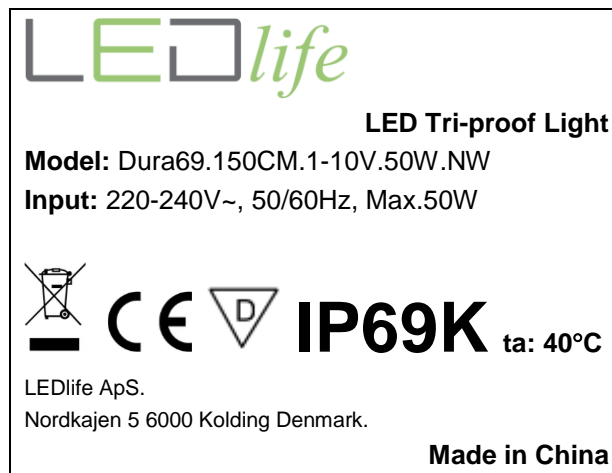
**Information on uncertainty of measurement:**

The uncertainties of measurement are calculated by the laboratory based on application of criteria given by OD-5014 for test equipment and application of test methods, decision sheets and operational procedures of IECEE.

IEC Guide 115 provides guidance on the application of measurement uncertainty principles and applying the decision rule when reporting test results within IECEE scheme, noting that the reporting of the measurement uncertainty for measurements is not necessary unless required by the test standard or customer.

Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

**Copy of marking plate:**



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

**Note:**

- The above markings are the minimum requirements required by the safety standard. For the final production, the additional markings which do not give rise to misunderstanding may be added.
- The CE marking and WEEE symbol (if any) should be at least 5,0 mm and 7,0 mm respectively in height.
- According to the EU directives which have been aligned with EU NLF (new legislative framework), both of manufacturer and importer's name and address shall be affixed on the product or, where that is not possible, on its packaging or in a document accompanying the product before the product is placed on the EU market.
- Attached near the LED module



- The height of symbol "■" was not less than 7mm.
- The height of the other graphical symbols was not less than 5mm.

<b>Test item particulars</b> .....	LED Tri-proof Light
Classification of installation and use .....	Class I, IP69K
Supply Connection .....	Power cord

**Possible test case verdicts:**

- test case does not apply to the test object .....
- test object does meet the requirement.....
- test object does not meet the requirement.....

**Testing:**

Date of receipt of test items..... : July 20, 2024

Date(s) of performance of tests .....


**General remarks:**

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

Throughout this report, a point (coma) is used as the decimal separator.  
 List of test equipment must be kept on file and available for review.

- General product information:**
- The classification for LED Tri-proof Light is Class I, IP69K; and it is suitable for indoor used and outdoor.
  - The specified maximum ambient operating temperature for luminaries is 40°C.
  - All models have the similar mechanical and electrical construction, main differences among them are size, wattage and LED chip quantity and LED Driver.

Model	Rating	Power (W)	LED driver model	LED quantity (Pcs)	Size (mm)	/
Dura69.60CM.RA90.21W.WW	220-240Vac, 50/60Hz;	21	LF-GMR020YS II	2835, 143	600*72*72	1.2kg/ ta: 40°C/ IP69K
Dura69.60CM.150LM.21W.NW			LF-GMR020YS II			
Dura69.60CM.1-10V.21W.NW			LF-GLD025YE			
Dura69.120CM.150LM.38W.NW	220-240Vac, 50/60Hz;	38	LF-GMR040YS II	2835, 286	1200*72*72	1.7kg/ ta: 40°C/ IP69K
Dura69.120CM.RA90.38W.WW			LF-GMR040YS II			
Dura69.120CM.1-10V.38W.NW			LF-GLD045YE			
Dura69.150CM.150LM.45W.CW	220-240Vac, 50/60Hz;	45	LF-GMR060YS II	2835, 286	1500*72*72	2.0kg/ ta: 40°C/ IP69K
Dura69.150CM.150LM.45W.NW			LF-GMR060YS II			
Dura69.150CM.1-10V.RA90.45W.NW			LF-GLD055YE			
Dura69.150CM.1-10V.RA90.45W.WW			LF-GLD055YE			
Dura69.150CM.1-10V.50W.NW	220-240Vac, 50/60Hz;	50	LF-GLD055YE	2835, 286	1500*72*72	2.0kg/ ta: 40°C/ IP69K

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
<b>1.4 (0)</b>	<b>GENERAL TEST REQUIREMENTS</b>		—
1.4 (0.3)	More sections applicable .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
1.4 (0.5)	Components	(see Annex 1)	—
<b>1.4 (0.7)</b>	<b>Information for luminaire design in light sources standards</b>		—
1.4 (0.7.2)	Light source safety standard .....	IEC 62031; EN IEC 62031	—
	Luminaire design in the light source safety standard		P
<b>1.5 (2)</b>	<b>CLASSIFICATION OF LUMINAIRES</b>		—
1.5 (2.2)	Type of protection .....	Class I	P
1.5 (2.3)	Degree of protection .....	IP69K	—
1.5 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
1.5 (2.5)	Luminaire for normal use .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Luminaire for rough service .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
<b>1.6 (3)</b>	<b>MARKING</b>		P
1.6 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
1.6 (3.3)	Additional information		P
	Language of instructions	English	P
1.6 (3.3.1)	Combination luminaires		N/A
1.6 (3.3.2)	Nominal frequency in Hz	50/60Hz	P
1.6 (3.3.3)	Operating temperature		N/A
1.6 (3.3.5)	Wiring diagram		P
1.6 (3.3.6)	Special conditions		N/A
1.6 (3.3.7)	Metal halide lamp luminaire – warning		N/A
1.6 (3.3.8)	Limitation for semi-luminaires		N/A
1.6 (3.3.9)	Power factor and supply current		N/A
1.6 (3.3.10)	Suitability for use indoors		P
1.6 (3.3.11)	Luminaires with remote control		N/A
1.6 (3.3.12)	Clip-mounted luminaire – warning		N/A
1.6 (3.3.13)	Specifications of protective shields		N/A
1.6 (3.3.14)	Symbol for nature of supply		P
1.6 (3.3.15)	Rated current of socket outlet		N/A
1.6 (3.3.16)	Rough service luminaire		N/A
1.6 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments	type Y	P
1.6 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (3.3.19)	Protective conductor current in instruction if applicable		N/A
1.6 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
1.6 (3.3.21)	Non replaceable and non-user replaceable light sources information provided	Non-user replaceable	P
1.6 (3.3.22)	Controllable luminaires, classification of insulation provided	Double/reinforce insulation between control terminal and LV supply	P
1.6 (3.3.23)	Luminaires without control gear provided with necessary information for selection of appropriate component		N/A
1.6 (3.3.24)	If not supplied with terminal block, information on the packaging		P
1.6 (3.3.25)	Luminaires employing light sources emitting UV on mains wiring, information provided		P
1.6 (3.3.26)	Wall mounted luminaire using external flexible cable or cord longer than 0.3 m, information provided		P
1.6 (3.4)	Test with water		P
	Test with hexane	15s	P
	Legible after test	15s	P
	Label attached		P
<b>1.7 (4)</b>	<b>CONSTRUCTION</b>		P
1.7 (4.2)	Components replaceable without difficulty		N/A
1.7 (4.3)	Wireways smooth and free from sharp edges		P
<b>1.7 (4.4)</b>	<b>Lamp holders</b>		<b>N/A</b>
1.7 (4.4.1)	Integral lamp holder		N/A
1.7 (4.4.2)	Wiring connection		N/A
1.7 (4.4.3)	Lamp holder for end-to-end mounting		N/A
1.7 (4.4.4)	Positioning		N/A
	- pressure test (N) .....		—
	After test the lamp holder comply with relevant standard sheets and show no damage		N/A
	After test on single-capped lamp holder the lamp holder has not moved from its position and show no permanent deformation		N/A
	- bending test (N) .....		—
	After test the lamp holder has not moved from its position and show no permanent deformation		N/A
1.7 (4.4.5)	Peak pulse voltage		N/A
1.7 (4.4.6)	Centre contact		N/A
1.7 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7 (4.4.8)	Lamp connectors		N/A
1.7 (4.4.9)	Caps and bases correctly used		N/A
1.7 (4.4.10)	Light source for lamp holder or connection according IEC 60061 not connected another way		N/A
<b>1.7 (4.5)</b>	<b>Starter holders</b>		N/A
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
<b>1.7 (4.6)</b>	<b>Terminal blocks</b>		P
	Tails		P
	Unsecured blocks		P
<b>1.7 (4.7)</b>	<b>Terminals and supply connections</b>		P
1.7 (4.7.1)	Contact to metal parts		P
1.7 (4.7.2)	Test 8 mm live conductor		N/A
	Test 8 mm earth conductor		N/A
1.7 (4.7.3)	Terminals for supply conductors		P
1.7 (4.7.3.1)	Welded method and material		N/A
	- stranded or solid conductor		N/A
	- spot welding		N/A
	- welding between wires		N/A
	- Type Z attachment		N/A
	- mechanical test according to 15.6.2		N/A
	- electrical test according to 15.6.3		N/A
	- heat test according to 15.6.3.2.3 and 15.6.3.2.4		N/A
1.7 (4.7.4)	Terminals other than supply connection		P
1.7 (4.7.5)	Heat-resistant wiring/sleeves		N/A
1.7 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A
<b>1.7 (4.8)</b>	<b>Switches</b>		<b>N/A</b>
	- adequate rating		N/A
	- adequate fixing		N/A
	- polarized supply		N/A
	- compliance with IEC 61058-1 for electronic switches		N/A
<b>1.7 (4.9)</b>	<b>Insulating lining and sleeves</b>		N/A
1.7 (4.9.1)	Retainment		N/A
	Method of fixing ..... :	--	N/A
1.7 (4.9.2)	Insulated linings and sleeves:		N/A
	Resistant to a temperature > 20 °C to the wire temperature or		N/A



IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	a) & c) Insulation resistance and electric strength		N/A
	b) Ageing test. Temperature (°C) .....		N/A
<b>1.7 (4.10)</b>	<b>Double or reinforced insulation</b>		N/A
1.7 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		N/A
	Safe installation fixed luminaires		N/A
	Capacitors and switches		N/A
1.7 (4.10.2)	Assembly gaps:		N/A
	- not coincidental		N/A
	- no straight access with test probe		N/A
1.7 (4.10.3)	Retention of insulation:		N/A
	- fixed		N/A
	- unable to be replaced; luminaire inoperative		N/A
	- sleeves retained in position		N/A
	- lining in lamp holder		N/A
1.7 (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
<b>1.7 (4.11)</b>	<b>Electrical connections and current-carrying parts</b>		<b>P</b>
1.7 (4.11.1)	Contact pressure		P
1.7 (4.11.2)	Screws:		P
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
1.7 (4.11.3)	Screw locking:		P
	- spring washer		P
	- rivets		N/A
1.7 (4.11.4)	Material of current-carrying parts		P
1.7 (4.11.5)	No contact to wood or mounting surface		P
1.7 (4.11.6)	Electro-mechanical contact systems		N/A
<b>1.7 (4.12)</b>	<b>Screws and connections (mechanical) and glands</b>		<b>P</b>
1.7 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N/A
	Torque test: torque (Nm); part.....	Screw fixed terminal blocks: 1.2 Nm	P

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Torque test: torque (Nm); part..... :	Screw fixed LED driver: 1.2 Nm	P
	Torque test: torque (Nm); part..... :	Screw fixed plastic enclosure: 2.0 Nm	P
	Torque test: torque (Nm); part..... :		N/A
	Torque test: torque (Nm); part..... :		N/A
1.7 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
1.7 (4.12.4)	Locked connections:		P
	- fixed arms; torque (Nm) ..... :		N/A
	- lamp holder; torque (Nm) ..... :		N/A
	- push-button switches; torque 0,8 Nm ..... :		N/A
1.7 (4.12.5)	Screwed glands; force (Nm)..... :	Screwed plastic gland: 7.5Nm	P
<b>1.7 (4.13)</b>	<b>Mechanical strength</b>		P
1.7 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm) ..... :		N/A
	- other parts; energy (Nm) ..... :	Enclosure: 0,35Nm	P
	1) live parts		P
	2) linings		P
	3) protection		P
	4) covers		P
1.7 (4.13.2)	Metal parts have adequate mechanical strength		P
1.7 (4.13.3)	Straight test finger		N/A
1.7 (4.13.4)	Rough service luminaires		N/A
	- IP54 or higher		N/A
	a) fixed		N/A
	b) hand-held		N/A
	c) delivered with a stand		N/A
	d) for temporary installations and suitable for mounting on a stand		N/A
1.7 (4.13.6)	Tumbling barrel		N/A
<b>1.7 (4.14)</b>	<b>Suspensions, fixings and means of adjusting</b>		P
1.7 (4.14.1)	Mechanical load:		P
	A) four times the weight	Model: Dura69.150CM.1-10V.50W.NW; 4 x 2.0 Kg=8.0 kg	P
	B) torque 2,5 Nm		N/A
	C) bracket arm; bending moment (Nm)..... :		N/A
	D) load track-mounted luminaires		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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
1.7 (4.14.2)	Load to flexible cables		N/A
	Mass (kg) .....		—
	Stress in conductors (N/mm <sup>2</sup> ) .....		N/A
	Mass (kg) of semi-luminaire .....		N/A
	Bending moment (Nm) of semi-luminaire .....		N/A
1.7 (4.14.3)	Adjusting devices:		N/A
	- flexing test; number of cycles.....		N/A
	- strands broken .....		N/A
	- electric strength test afterwards		N/A
1.7 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
1.7 (4.14.5)	Guide pulleys		N/A
1.7 (4.14.6)	Strain on socket-outlets		N/A
<b>1.7 (4.15)</b>	<b>Flammable materials</b>		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
1.7 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		N/A
	a) construction		N/A
	b) temperature sensing control		N/A
	c) surface temperature		N/A
<b>1.7 (4.16)</b>	<b>Luminaires for mounting on normally flammable surfaces</b>		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
1.7 (4.16.1)	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
1.7 (4.16.2)	Thermal protection:		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- in lamp control gear		N/A
	- external		N/A
	- fixed position		N/A
	- temperature marked lamp control gear		N/A
1.7 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N/A
<b>1.7 (4.17)</b>	<b>Drain holes</b>		P
	Clearance at least 5 mm		N/A
<b>1.7 (4.18)</b>	<b>Resistance to corrosion</b>		P
1.7 (4.18.1)	- rust-resistance		P
1.7 (4.18.2)	- season cracking in copper		P
1.7 (4.18.3)	- corrosion of aluminium		P
1.7 (4.19)	Igniters compatible with ballast		N/A
1.7 (4.20)	Rough service vibration		N/A
<b>1.7 (4.21)</b>	<b>Protective shield</b>		N/A
1.7 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A
	Shield of glass if tungsten halogen lamps		N/A
1.7 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
1.7 (4.21.3)	No direct path		N/A
1.7 (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
1.7 (4.22)	Attachments to lamps not cause overheating or damage		N/A
1.7 (4.23)	Semi-luminaires comply Class II		N/A
<b>1.7 (4.24)</b>	<b>Photobiological hazards</b>		P
1.7 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N/A
1.7 (4.24.2)	Retinal blue light hazard		P
	Class of risk group assessed according to IEC/TR 62778 .....	RG1	—
	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

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Clause	Requirement + Test	Result - Remark	Verdict
<b>1.7 (4.25)</b>	<b>Mechanical hazard</b>		P
	No sharp point or edges		P
<b>1.7 (4.26)</b>	<b>Short-circuit protection</b>		N/A
1.7 (4.26.1)	Adequate means of uninsulated accessible SELV / PELV parts		N/A
1.7 (4.26.2)	Short-circuit test with test chain according 4.26.3:		N/A
	Supply source ES1 PSE		N/A
	Test chain not melt through		N/A
	Test sample not exceed values of Table 12.1 and 12.2		N/A
<b>1.7 (4.27)</b>	<b>Terminal blocks with integrated screwless protective earthing contacts</b>		N/A
	Test according Annex V		N/A
	Pull test of terminal fixing (20 N)		N/A
	After test, resistance < 0,05 $\Omega$		N/A
	Pull test of mechanical connection (50 N)		N/A
	After test, resistance < 0,05 $\Omega$		N/A
	Voltage drop test, resistance < 0,05 $\Omega$		N/A
<b>1.7 (4.28)</b>	<b>Fixing of thermal sensing control</b>		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 ( $^{\circ}\text{C}$ ) ..... :		—
	100 cycles between t min and t max		N/A
	Temperature sensing control still in position		N/A
<b>1.7 (4.29)</b>	<b>Luminaires with non-replaceable light source</b>		N/A
	Not possible to replace light source		N/A
	Live part not accessible after parts have been opened by hand or tools		N/A
<b>1.7 (4.30)</b>	<b>Luminaires with non-user replaceable light source</b>		P
	If protective cover provide protection against electric shock and marked with "caution, electric shock risk" symbol:		P
	At least one fixing means requiring use of tool		P
<b>1.7 (4.31)</b>	<b>Insulation between circuits</b>		P
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3		P

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Clause	Requirement + Test	Result - Remark	Verdict
	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
1.7 (4.31.1)	SELV or PELV circuits		P
	Used SELV/PELV source		P
	Voltage ≤ ELV		P
	Insulating of SELV/PELV circuits from LV supply		P
	Insulating of SELV/PELV circuits from other non SELV/PELV circuits		P
	Insulating of SELV/PELV circuits from FELV		N/A
	Insulating of SELV/PELV circuits from other SELV/PELV circuits		N/A
	SELV/PELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to make any electrical contact with 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
1.7 (4.31.2)	FELV circuits		N/A
	Used FELV source		N/A
	Voltage ≤ ELV		N/A
	Insulating of FELV circuits from LV supply		N/A
	FELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to make any electrical contact with 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
1.7 (4.31.3)	Other circuits		N/A
	Other circuits insulated from accessible parts according Table X.1		N/A
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		N/A
	- conductive parts are connected together		N/A
	- test according 7.2.3		N/A
	- conductive part not cause an electric shock in case of an insulation fault		N/A
	- equipotential bonding in master/slave applications		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- master luminaire provided with terminal for accessible conductive parts of slave luminaires		N/A
	- slave luminaire constructed as class I		N/A
<b>1.7 (4.32)</b>	<b>Overvoltage protective devices</b>		N/A
	Comply with IEC 61643-11		N/A
	External to controlgear and connected to earth:		N/A
	- only in fixed luminaires		N/A
	- only connected to protective earth		N/A
<b>1.6 (4.33)</b>	<b>Luminaire powered via information technology communication cabling</b>		N/A
	Requirements for Class III luminaire		N/A
	Rated voltage within the range of ES1 and does not exceed maximum voltage of used connector		N/A
	Luminaire does not create any hazard from overvoltage	(see Annex 2)	N/A
<b>1.6 (4.34)</b>	<b>Electromagnetic fields (EMF)</b>		P
	No harmful electromagnetic fields		P
<b>1.6 (4.35)</b>	<b>Protection against moving fan blades</b>		N/A
	Test with a standard test finger		N/A
	Test with test probe acc. to Figure 13 (IEC 61032) for portable luminaire		N/A
	Blades rounded with radius $\geq 0.5$ mm and:		N/A
	-hardness less than D60 Shore		N/A
	-peripheral speed less than 15 m/s		N/A
	-input power of fan $\leq 2$ W at rated voltage		N/A
<b>1.6 (4.36)</b>	<b>Track-mounted luminaires</b>		N/A
	Test in accordance with Annex A of IEC60570:2003/AMD2:2019		N/A
<b>1.8 (11)</b>	<b>CREEPAGE DISTANCES AND CLEARANCES</b>		P
1.8 (11.2.1)	Impulse withstand category (Normal category II)	Category II <input checked="" type="checkbox"/> Category III <input type="checkbox"/>	—
	Category III according Annex U		N/A
	Protected against pollution, reduced creepage and clearance according Annex P of IEC 61347-1		N/A
1.8 (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
1.8 (11.2.3)	Clearances for frequency up to 30 kHz	See Test Table 1.7 (11.2) I	P

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Clause	Requirement + Test	Result - Remark	Verdict
	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
<b>1.9 (7)</b>	<b>PROVISION FOR EARTHING</b>		<b>P</b>
1.9 (7.2.1 + 7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		P
	Resistance < 0,5 $\Omega$ ..... :	0.096 $\Omega$	P
	Self-tapping screws used		N/A
	Thread-forming screws		N/A
	Thread-forming screw used in a groove		N/A
	Protective earth makes contact first		N/A
	Terminal blocks with integrated screwless protective earthing contacts tested according Annex V		N/A
	Protective earthing of the luminaire not via built-in control gear		N/A
1.9 (7.2.2 + 7.2.3)	Protective earth continuity in joints, etc.		N/A
1.9 (7.2.4)	Locking of clamping means		N/A
	Compliance with 4.7.3		N/A
1.9 (7.2.5)	Protective earth terminal integral part of connector socket		N/A
1.9 (7.2.6)	Protective earth terminal adjacent to mains terminals		P
1.9 (7.2.7)	Electrolytic corrosion of the protective earth terminal		P
1.9 (7.2.8)	Material of protective earth terminal		P
	Contact surface bare metal		P
1.9 (7.2.10)	Class II luminaire for looping-in		N/A
	Double or reinforced insulation to functional earth		N/A
1.9 (7.2.11)	Protective earthing core coloured green-yellow		P
	Length of earth conductor		P
1.9 (7.2.12)	PELV circuit connected to protective earth for functional purpose		N/A
<b>1.10 (14)</b>	<b>SCREW TERMINALS</b>		<b>P</b>
	Separately approved; component list	(see Annex 1)	P
	Part of the luminaire	(see Annex 3)	N/A
<b>1.10 (15)</b>	<b>SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS</b>		<b>P</b>
	Separately approved; component list..... :	(see Annex 1)	P



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Clause	Requirement + Test	Result - Remark	Verdict
	Part of the luminaire .....	(see Annex 4)	P
<b>1.11 (5)</b>	<b>EXTERNAL AND INTERNAL WIRING</b>		P
<b>1.11 (5.2)</b>	<b>Supply connection and external wiring</b>		P
1.11 (5.2.1)	Means of connection .....	Supply core	P
	Outdoor luminaire has not PVC insulated external wiring if not Class III or SELV/PELV circuits $\leq 25$ V AC/60 V DC/25 V peak interrupted DC voltage with frequency 10Hz -200 Hz or protected from outdoor environment		N/A
1.11 (5.2.2)	Type of cable .....	(see Annex 1)	P
	Nominal cross-sectional area (mm <sup>2</sup> ) .....	(see Annex 1)	P
	Cables equal to IEC 60227 or IEC 60245		P
1.11 (5.2.3)	Type of attachment, X, Y or Z		P
1.11 (5.2.5)	Type Z not connected to screws		N/A
1.11 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
1.11 (5.2.7)	Cable entries through rigid material have rounded edges		P
1.11 (5.2.8)	Insulating bushings:		N/A
	- suitably fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- tubes or guards made of insulating material		N/A
1.11 (5.2.9)	Locking of screwed bushings		N/A
1.11 (5.2.10)	Cord anchorage:		P
	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		P
	- no tying of cables into knots etc.		P
	- insulating material or lining		P
1.11 (5.2.10.1)	Cord anchorage for type X attachment:		N/A
	a) at least one part fixed		N/A
	b) types of cable		N/A
	c) no damaging of the cable		N/A
	d) whole cable can be mounted		N/A
	e) no touching of clamping screws		N/A
	f) metal screw not directly on cable		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	g) replacement without special tool		N/A
	Glands not used as anchorage		N/A
	Labyrinth type anchorages		N/A
1.11 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		P
1.11 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N).....: :	80N	P
	- torque test: torque (Nm).....: :	0.35Nm	P
	- displacement $\leq 2$ mm	1.22mm	P
	- no movement of conductors		P
	- no damage of cable or cord		P
	- function independent of electrical connection		N/A
1.11 (5.2.10.4)	Luminaire with/designed for use with supply cord with maximum current of 2A:		N/A
	- Ordinary Class III luminaire supplied with SELV $\leq 25$ V RMS/60V DC		N/A
	- Ordinary Class III luminaire supplied with PELV $\leq 12$ V RMS/30V DC		N/A
	- Other than ordinary Class III luminaire supplied with voltage $\leq 12$ V RMS/30V DC		N/A
	Pull test of 30N		N/A
1.11 (5.2.11)	External wiring passing into luminaire		P
1.11 (5.2.12)	Looping-in terminals		N/A
1.11 (5.2.13)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		P
1.11 (5.2.14)	Mains plug same protection		P
	Class III luminaire plug		N/A
	No unsafe compatibility		P
1.11 (5.2.15)	Connectors for Class III luminaires (IEC 60603 or IEC 62680)		N/A
1.11 (5.2.16)	Appliance inlets (IEC 60320)		N/A
	Installation couplers (IEC 61535)		N/A
	Appliance inlet or connector systems (IEC 61984)		N/A
1.11 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
1.11 (5.2.18)	Used plug in accordance with		P
	- IEC 60083		N/A
	- other standard		P

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Clause	Requirement + Test	Result - Remark	Verdict
<b>1.11 (5.3)</b>	<b>Internal wiring</b>		P
1.11 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		N/A
	- not delivered/ mounting instruction		N/A
	- factory assembled		N/A
	- socket outlet loaded (A) .....		N/A
	- temperatures .....	(see Annex 2)	P
	Green-yellow for protective earth only		P
1.11 (5.3.1.1)	Internal wiring connected directly to fixed wiring		N/A
	Cross-sectional area (mm <sup>2</sup> ).....	(See Annex 1)	N/A
	Insulation thickness (mm) .....	Approved wire	N/A
	Extra insulation added where necessary		N/A
1.11 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		P
	Cross-sectional area (mm <sup>2</sup> ).....	see Annex 1	P
1.11 (5.3.1.3)	Double or reinforced insulation for class II		N/A
1.11 (5.3.1.4)	Conductors without insulation		N/A
1.11 (5.3.1.5)	SELV/PELV current-carrying parts		N/A
1.11 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
1.11 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		P
	Joints, raising/lowering devices		N/A
	Telescopic tubes etc.		N/A
	No twisting over 360°		P
1.11 (5.3.3)	Insulating bushings:		N/A
	- suitable fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- cables with protective sheath		N/A
1.11 (5.3.4)	Joints and junctions effectively insulated		N/A
1.11 (5.3.5)	Strain on internal wiring		N/A
1.11 (5.3.6)	Wire carriers		N/A
1.11 (5.3.7)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
<b>1.11 (5.4)</b>	<b>Test to determine suitability of conductors having a reduced cross-sectional area</b>		N/A
	Under test the temperature of the luminaire wiring insulation not exceed the limits stated in Table 12.2		N/A
	No damage to luminaire wiring after test		N/A
<b>1.12 (8)</b>	<b>PROTECTION AGAINST ELECTRIC SHOCK</b>		P
1.12 (8.2.1)	Live parts not accessible		P
	Basic insulated parts not used on the outer surface without appropriate protection		P
	Basic insulated parts not accessible with standard test finger on portable, settable and adjustable luminaires		P
	Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires		P
	Lamp and starter holders in portable and adjustable luminaires comply with double or reinforced insulation requirements		N/A
	Basic insulation only accessible under lamp or starter replacement		P
	Protection in any position		P
	Double-ended tungsten filament lamp		N/A
	Insulation lacquer not reliable		P
	Double-ended high-pressure discharge lamp		N/A
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
1.12 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
1.12 (8.2.3.a)	Class II luminaire:		N/A
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A
	- basic insulation not accessible other than during starter or lamp replacement		N/A
	- glass protective shields not used as supplementary insulation		N/A
1.12 (8.2.3.b)	BC lamp holder of metal in class I luminaires shall be connected to protective earth		N/A
1.12 (8.2.3.c)	SELV circuits with exposed current carrying parts:		N/A
	Ordinary luminaire:		N/A
	- voltage under load/ no-load AC (V).....:		N/A
	- voltage under load/ no-load DC (V).....:		N/A
	- interrupted DC voltage (V) .....		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- touch current if applicable (mA) .....		N/A
	One conductive part insulated if required		N/A
	Other than ordinary luminaire:		N/A
	- voltage under load/ no-load AC (V).....		N/A
	- voltage under load/ no-load DC (V).....		N/A
	- interrupted DC voltage (V) .....		N/A
	Class III luminaire only for connection to SELV		N/A
	Class III luminaire not provided with means for protective earthing		N/A
1.12 (8.2.3.d)	PELV circuits with exposed current carrying parts:		N/A
	Ordinary luminaire:		N/A
	- voltage under load/ no-load AC (V).....		N/A
	- voltage under load/ no-load DC (V).....		N/A
	Other than ordinary luminaire:		N/A
	- voltage under load/ no-load AC (V).....		N/A
	- voltage under load/ no-load DC (V).....		N/A
	One pole insulated if required		N/A
1.12 (8.2.4)	Portable luminaire has protection independent of supporting surface		N/A
1.12 (8.2.5)	Compliance with the standard test finger or relevant probe		P
1.12 (8.2.6)	Covers reliably secured		P
1.12 (8.2.7)	Luminaire other than below with capacitor > 0,5 $\mu$ F not exceed 50 V 1 min after disconnection	Max.0V	P
	Portable luminaire with capacitor > 0,1 $\mu$ F (0.25) not exceed 34 V 1 s after disconnection		N/A
	Other luminaires with capacitor > 0,1 $\mu$ F (0.25) with plug and track adaptors not exceed 60 V 5 s after disconnection		N/A
<b>1.13 (12)</b>	<b>ENDURANCE TEST AND THERMAL TEST</b>		P
1.13 (-)	If IP > IP 20 relevant test of (12.4), (12.5), (12.6) and (12.7) after (9.2) before (9.3) as specified in 1.14		—
<b>1.13 (12.2)</b>	<b>Selection of lamps and ballasts</b>		—
	Lamp used according Annex B	(Lamp used see Annex 2)	—
	Control gear if separate and not supplied	(Lamp used see Annex 2)	—
<b>1.13 (12.3)</b>	<b>Endurance test</b>		P
	a) mounting-position .....	Normal mounting position	—
	b) test temperature ( $^{\circ}$ C).....	Ta+10 $^{\circ}$ C	—

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Clause	Requirement + Test	Result - Remark	Verdict
	c) total duration (h) .....	240h	—
	d) supply voltage (V) .....	264V	—
	d) if not equipped with control gear, constant voltage/current (V) or (A) .....	LED module as delivered	—
1.13 (12.3.1d)	d) Class III luminaires powered via information technology communication cable:		N/A
	- voltage under normal operation (V).....:		—
	- voltage under abnormal operation (V).....:		—
	e) luminaire ceases to operate		—
	f) luminaire with constant light output function		N/A
1.13 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N/A
	- marking legible		P
	- no cracks, deformation etc.		P
1.13 (12.4)	<b>Thermal test (normal operation)</b>	(see Annex 2)	<b>P</b>
1.13 (12.5)	<b>Thermal test (abnormal operation)</b>	(see Annex 2)	<b>P</b>
1.13 (12.6)	<b>Thermal test (failed lamp control gear condition):</b>		N/A
1.13 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A) .....		—
	- case of abnormal conditions .....		—
	- electronic lamp control gear		N/A
	- measured winding temperature (°C): at 1,1 Un .....		—
	- measured mounting surface temperature (°C) at 1,1 Un .....		N/A
	- calculated mounting surface temperature (°C) .....		N/A
	- track-mounted luminaires		N/A
1.13 (12.6.2)	Temperature sensing control		N/A
	- case of abnormal conditions .....		—
	- thermal link		N/A
	- manual reset cut-out		N/A
	- auto reset cut-out		N/A
	- measured mounting surface temperature (°C) .....		N/A
	- track-mounted luminaires		N/A
1.13 (12.7)	<b>Thermal test (failed lamp control gear in plastic luminaires):</b>		N/A
1.13 (12.7.1)	Luminaire without temperature sensing control		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
1.13 (12.7.1.1)	Luminaire with fluorescent lamp $\leq 70W$		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 ( $^{\circ}C$ ): at 1,1 Un .....		—
	- measured temperature of fixing point/exposed part ( $^{\circ}C$ ): at 1,1 Un .....		—
	- calculated temperature of fixing point/exposed part ( $^{\circ}C$ ) .....		—
	Ball-pressure test .....	See Test Table 1.15 (13.2.1)	N/A
1.13 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp $> 70W$ , transformer $> 10 VA$		N/A
	- case of abnormal conditions .....		—
	- measured winding temperature ( $^{\circ}C$ ): at 1,1 Un .....		—
	- measured temperature of fixing point/exposed part ( $^{\circ}C$ ): at 1,1 Un .....		—
	- calculated temperature of fixing point/exposed part ( $^{\circ}C$ ) .....		—
	Ball-pressure test .....	See Test Table 1.15 (13.2.1)	N/A
1.13 (12.7.1.3)	Luminaire with short circuit proof transformers $\leq 10 VA$		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
1.13 (12.7.2)	Luminaire with temperature sensing control		N/A
	- thermal link .....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- manual reset cut-out .....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- auto reset cut-out .....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- case of abnormal conditions .....		—
	- highest measured temperature of fixing point/exposed part ( $^{\circ}C$ ): .....		—
	Ball-pressure test: .....	See Test Table 1.15 (13.2.1)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
<b>1.14 (9)</b>	<b>RESISTANCE TO DUST AND MOISTURE</b>		P
1.14 (-)	If IP > IP 20 the order of tests as specified in clause 1.12		N/A
1.14 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP .....	IP69K	—
	- mounting position during test .....	Normal mounting position	—
	- fixing screws tightened; torque (Nm) .....	—	—
	- tests according to clauses .....	Clause 9.2.2 & 9.2.10	—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N/A
	b) no talcum in dust-tight luminaire		P
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		N/A
	c.1) For luminaires without drain holes – no water entry		N/A
	c.2) For luminaires with drain holes – no hazardous water entry		N/A
	d) no water in watertight, pressure watertight, high pressure and temperature water jet-proof or high pressure and cold water jet-proof luminaire		N/A
	e) no contact with live parts (IP 2X)		N/A
	e) no entry into enclosure (IP 3X and IP 4X)		N/A
	e) no contact with live parts through drain holes and ventilation slots (IP3X and IP4X)		N/A
	f) no trace of water on part of lamp requiring protection from splashing water		N/A
	g) no damage of protective shield or glass envelope		N/A
1.14 (9.3)	Humidity test 48 h	25%; 93%R.H.; 48h	P
<b>1.15 (10)</b>	<b>INSULATION RESISTANCE AND ELECTRIC STRENGTH</b>		P
1.15 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø .....		—
	Insulation resistance (MΩ):		P
	SELV/PELV:		P
	- between current-carrying parts of different polarity :		N/A
	- between current-carrying parts and mounting surface .....	100MΩ [required 1MΩ]	P
	- between current-carrying parts and metal parts of the luminaire .....	100MΩ [required 1MΩ]	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....		N/A



IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- Insulation bushings as described in Section 5 .....		N/A
	Other than SELV/PELV:		N/A
	- between live parts of different polarity .....		N/A
	- between live parts and mounting surface .....		N/A
	- between live parts and metal parts .....		N/A
	- between live parts of different polarity through action of a switch.....		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts.....		N/A
	- Insulation bushings as described in Section 5 .....		N/A
1.15 (10.2.2)	Electric strength test		P
	Dummy lamp		N/A
	Luminaires with ignitors after 24 h test		N/A
	Luminaires with manual ignitors		N/A
	Test voltage (V):		P
	SELV/PELV:		P
	- between current-carrying parts of different polarity :		N/A
	- between current-carrying parts and mounting surface .....	1480V	P
	- between current-carrying parts and metal parts of the luminaire .....	1480V	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts.....		N/A
	- Insulation bushings as described in Section 5 .....		N/A
	Other than SELV/PELV:		N/A
	- between live parts of different polarity .....		N/A
	- between live parts and mounting surface .....		N/A
	- between live parts and metal parts .....		N/A
	- between live parts of different polarity through action of a switch.....		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts.....		N/A
	- Insulation bushings as described in Section 5.....		N/A
1.15 (10.3)	Touch current (mA).....	Max. 0,08mA (limit 0,7mA)	P
	Protective conductor current (mA).....	Protective conductor current: Max. 0,25mA (limit 3,5mA)	P
<b>1.16 (13)</b>	<b>RESISTANCE TO HEAT, FIRE AND TRACKING</b>		<b>P</b>
1.16 (13.2.1)	Ball-pressure test .....	See Test Table 1.16 (13.2.1)	P

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Clause	Requirement + Test	Result - Remark	Verdict
1.16 (13.3.1)	Needle-flame test (10 s) .....	See Test Table 1.16 (13.3.1)	P
1.16 (13.3.2)	Glow-wire test (650°C) .....	See Test Table 1.16 (13.3.2)	P
1.16 (13.4)	Proof tracking test (IEC 60112) .....	See Test Table 1.16 (13.4)	N/A

1.8 (11.2)	TABLE I: Creepage distances and clearances							P
	Minimum distances (mm) for a.c. up to 30 kHz sinusoidal voltages							P
	Applicable part of IEC 60598-1 Table 11.1.A*, 11.1.B* and 11.2*							P
	Insulation type **	Measured clearance	Required		Measured creepage	Required		
			clearance	*Table		creepage	*Table	
Distance 1:	B	2,8	1,5	11.1.B	2,8	2,50	11.1.A	
Working voltage (V) .....					240Vac		—	
PTI .....					< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>		—	
Pulse voltage or $U_p$ if applicable (kV) .....					N/A		—	
Supplementary information: between different polarities of live parts L/N/E.								
Distance 2:	B	1.8	--	11.1.B	1.8	--	11.1.A	
Working voltage (V) .....					50Vac		—	
PTI .....					< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>		—	
Pulse voltage or $U_p$ if applicable (kV) .....					N/A		—	
Supplementary information: Between live parts on the LED module and metal parts								
Distance 3:	--	--	--	--	--	--	--	
Working voltage (V) .....					--		—	
PTI .....					< 600 <input type="checkbox"/> ≥ 600 <input type="checkbox"/>		—	
Pulse voltage or $U_p$ if applicable (kV) .....					--		—	
Supplementary information: --								

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

1.8 (11.2)	TABLE II: Creepage distances and clearances							N/A
Minimum distances (mm) for a.c. higher than 30 kHz sinusoidal voltages								
Applicable part of IEC 61347-1 Table 7 and 8* or IEC 60664-4 Table 1 and 2								
Distances	Insulation type **	Measured clearance	Required		Measured creepage	Required		
			clearance	*Table		creepage	*Table	
Distance 1:								
Working voltage (V) .....							—	
Frequency if applicable (kHz) .....							—	
PTI .....					< 600 <input type="checkbox"/> ≥ 600 <input type="checkbox"/>		—	
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) .....							—	
Supplementary information:								

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Clause	Requirement + Test	Result - Remark	Verdict
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\*\* Insulation type: B – Basic; S – Supplementary; R – Reinforced.

ANNEX 1		TABLE: Critical components information					P
Object / part No.	Code	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity <sup>1)</sup>	
LED Driver	B	Lifud Technology Co., Ltd.	LF-GMR020YS II	Input: 220-240Vac, 50/60Hz, 0.14A; Output: 33-42Vdc, 0.20-0.55A, Max.8.4-23.1W; U <sub>out</sub> : 55Vdc; Built-in, SELV, tc:70°C, ta:50°C	IEC/EN 61347-1 IEC/EN 61347-2-13	TUV SUD CB Report.: 211-14180272-200	
LED Driver	B	Lifud Technology Co., Ltd.	LF-GMR040YS II	Input: 220-240Vac, 50/60Hz, 0.26A; Output: 33-42Vdc, 0.75-1.05A, Max.31.5-44.1W; U <sub>out</sub> : 55Vdc; Built-in, SELV, tc:85°C, ta:50°C	IEC/EN 61347-1 IEC/EN 61347-2-13	TUV SUD CB Report.: 211-14180272-200	
LED Driver	B	Lifud Technology Co., Ltd.	LF-GMR060YS II	Input: 220-240Vac, 50/60Hz, 0.40A; Output: 33-42Vdc, 1.1-1.55A, Max.46.2-65.1W; U <sub>out</sub> : 55Vdc; Built-in, SELV, tc:85°C, ta:50°C	IEC/EN 61347-1 IEC/EN 61347-2-13	TUV SUD CB Report.: 211-14180272-200	
LED Driver	B	Lifud Technology Co., Ltd.	LF-GLD025YE	Input: 220-240Vac, 50/60Hz, 0.15A; Output: 25-42Vdc, 0.25-0.55A, Max.10.5-23.1W; U <sub>out</sub> : 55Vdc; Built-in, SELV, tc:90°C, ta:50°C	IEC/EN 61347-1 IEC/EN 61347-2-13	TUV CB Ref. Certif. No.: No. N8A 004006 0146 Rev. 00	
LED Driver	B	Lifud Technology Co., Ltd.	LF-GLD045YE	Input: 220-240Vac, 50/60Hz, 0.30A; Output: 25-42Vdc, 0.85-1.05A, Max.35.7-44.1W; U <sub>out</sub> : 55Vdc; Built-in, SELV, tc:90°C, ta:50°C	IEC/EN 61347-1 IEC/EN 61347-2-13	TUV CB Ref. Certif. No.: No. N8A 004006 0146 Rev. 00	
LED Driver	B	Lifud Technology Co., Ltd.	LF-GLD055YE	Input: 220-240Vac, 50/60Hz, 0.35A; Output: 25-42Vdc, 1.1-1.3A, Max.46.2-54.6W; U <sub>out</sub> : 55Vdc; Built-in, SELV, tc:90°C, ta:50°C	IEC/EN 61347-1 IEC/EN 61347-2-13	TUV CB Ref. Certif. No.: No. N8A 004006 0146 Rev. 00	

IEC 60598-2-1						
Clause	Requirement + Test			Result - Remark		Verdict
Inside wire	B	DONG GUAN SHENG PAI ELECTRIC WIRE & CABLE CO LTD	1332	300V, 200 °C, 20 AWG	--	UL E347603
(Alternative)	B	DONGGUAN LIUQUAN WIRE CO LTD	1332	300V, 200 °C, 20 AWG	--	UL E327087
Earthing wire	B	NBE ELECTRICAL COMPONENTS LTD	1015	600V, 105 °C, 20 AWG	--	UL E228671
(Alternative)	B	XIAMEN GOLDEN DRAGON AUTOMOBILE ELECTRONIC CO LTD	1015	600V, 105 °C, 20 AWG	--	UL E344943
Connector	B	Shenzhen Lilutong Electronic Technology Co., Ltd.	LLT-M19-15 Series	IP69K, 105°C, 250V, 15A	IEC/EN 61984	TUV SUD B 16 03 90230 006
LED PCB	B	Shenzhen ZYD Electronic Technology Co Ltd	ZYD-L	V-0, 130°C, metal base	IEC/EN 60598-1 IEC/EN 60598-2-1	Tested with appliance and UL E483786
(Alternative)	B	ShenZhen HYY Sci-Tech Co Ltd	HYY-01	V-0, 130°C, metal base	IEC/EN 60598-1 IEC/EN 60598-2-1	Tested with appliance and UL E467377
(Alternative)	B	GOLDENMAX INTERNATIONAL TECHNOLOGY (ZHUHAI) LTD	GF432	V-0; 130oC	IEC/EN 60598-1 IEC/EN 60598-2-1	Tested with appliance and UL E330731
(Alternative)	B	SHENZHEN YIFANG ELECTRONICS CO LTD	YF-5	V-0; 130oC	IEC/EN 60598-1 IEC/EN 60598-2-1	Tested with appliance and UL E320003
(Alternative)	B	INTERNATIONAL LAMINATE MATERIAL LTD	DLC3	V-0; 130oC	IEC/EN 60598-1 IEC/EN 60598-2-1	Tested with appliance and UL E134893
PCB for LED module	B	SHENZHEN YIFANG ELECTRONICS CO LTD	YF-5	V-0, 125°C	IEC/EN 60598-1 IEC/EN 60598-2-1	Tested with appliance and UL E320003
Plastic enclosure	B	Teijin Limited Resin And Plastic	LN-1250G	V-0, 125°C	IEC/EN 60598-1 IEC/EN 60598-2-1	Tested with appliance and UL E50075
(Alternative)	B	LOTTE CHEMICAL CORPORATION	PC-1100U	V-0, 125°C	IEC/EN 60598-1 IEC/EN 60598-2-1	Tested with appliance and UL E85371

IEC 60598-2-1						
Clause	Requirement + Test			Result - Remark		Verdict
Diffuser	B	Trinseo (Hong Kong) LTD	EMERGE PC 8830-(m) LT(f1)	PC, V-0, 125°C, Min.3mm thick.	UL 94	Tested with appliance and E206114
Diffuser	B	BASF CORP	130FR(+)(f1)(t7)	PET, V-0, 125°C, Min.3mm thick.	UL 94	Tested with appliance and E36632
LEDs	B	Jiangxi MTC Lighting Co., Ltd	MK8XM-CX	If: 150mA Vf: 2.6-2.9V Side: 3.48*2.77*0.68mm; CCT: 2700-6500K	IEC 62778	Tested with appliance

## Supplementary information:

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

The codes above have the following meaning:

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

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Clause	Requirement + Test	Result - Remark	Verdict
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<b>ANNEX 2</b>	<b>TABLE: Thermal tests of Section 12</b>		<b>P</b>
	Type reference .....	Dura69.150CM.150LM.45W.N W	—
	Lamp used.....	LED module 286pcs	—
	Lamp control gear used.....	LF-GMR050YS II	—
	Mounting position of luminaire :	As normal use	—
	Supply wattage (W) :	--	—
	Supply current (A) :	--	—
	Temperatures in test 1 - 4 below are corrected for ta (°C) .....	40	—
	- abnormal operating mode .....	a. short-circuit one LED; b. open-circuit one LED; c. short-circuit LED driver output	—
1.12 (12.4)	- test 1: rated voltage .....	--	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....	1.06X220Vac 1.06X240Vac	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....	--	—
	Through wiring or looping-in wiring loaded by a current of A during the test .....	--	—
1.12 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....	--	—

Temperature measurements (°C)

Part	Ambient	Cl. 12.4 – normal					Cl. 12.5 – abnormal	
		test 1	test 2		test 3	limit	test 4	limit
			1	2				
Terminal Blocks	40	--	48.3	45.5	--	105	--	--
Inside wire	40	--	62.0	60.4	--	90	--	--
LED Driver of tc	40	--	72.5	70.3	--	100	--	--
PWB near LED	40	--	86.9	82.6	--	130	--	--
Lens	40	--	61.9	60.1	--	130	--	--
Marking	40	--	58.1	57.2	--	90	--	--
Mounting surface	40	--	49.7	46.8	--	90	--	--

Supplementary information: --

<b>ANNEX 2</b>	<b>TABLE: Thermal tests of Section 12</b>		<b>P</b>
	Type reference .....	DURA69.150CM.1- 10V.50W.NW	—

IEC 60598-2-1								
Clause	Requirement + Test				Result - Remark		Verdict	
	Lamp used..... :				LED module 286pcs		—	
	Lamp control gear used..... :				LF-GLD055YE		—	
	Mounting position of luminaire :				As normal use		—	
	Supply wattage (W) :				--		—	
	Supply current (A) :				--		—	
	Temperatures in test 1 - 4 below are corrected for ta (°C) .....				40		—	
	- abnormal operating mode .....				a. short-circuit one LED; b. open-circuit one LED; c. short-circuit LED driver output		—	
1.12 (12.4)	- test 1: rated voltage .....				--		—	
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....				1.06X220Vac 1.06X240Vac		—	
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....				--		—	
	Through wiring or looping-in wiring loaded by a current of A during the test .....				--		—	
1.12 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....				--		—	
Temperature measurements (°C)								
Part	Ambient	Cl. 12.4 – normal					Cl. 12.5 – abnormal	
		test 1	test 2		test 3	limit	test 4	limit
			1	2				
Terminal Blocks	40	--	52.6	50.7	--	105	--	--
Inside wire	40	--	70.0	65.3	--	90	--	--
LED Driver of tc	40	--	75.1	72.3	--	90	--	--
PWB near LED	40	--	80.6	72.7	--	130	--	--
Lens	40	--	68.9	62.1	--	130	--	--
Marking	40	--	57.5	53.4	--	90	--	--
Mounting surface	40	--	48.1	46.3	--	90	--	--
Supplementary information: --								

1.16 (13.2.1) TABLE: Ball Pressure Test of Thermoplastics				P
Allowed impression diameter (mm):			≤2.0	—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)		Impression diameter (mm)
LED PCB	See Annex A	125		1.51
Plastic lens	See Annex A	125		1.32

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Clause	Requirement + Test	Result - Remark	Verdict
Light control plastic shell	See Annex A	125	1.35
Supplementary information: --			

<b>1.16 (13.3.1)</b>	<b>TABLE: Needle-Flame Test(IEC60695-11-5)</b>				<b>P</b>
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (s)	Ignition of specified layer (Yes/No)	Duration of burning(s)	Verdict
LED Driver PCB	See Annex A	10s	No	0s	P
Plastic lens	See Annex A	10s	No	0s	P
Light control plastic shell	See Annex A	10s	No	0s	P
Supplementary information: --					

<b>1.16 (13.3.2)</b>	<b>TABLE: Glow-wire test (IEC 60695-2-11)</b>				<b>P</b>
Glow wire temperature.....:		650°C			—
Object/ Part No./ Material	Manufacturer/ trademark	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict	
LED Driver PCB	See Annex A	No	0	P	
Plastic lens	See Annex A	No	0	P	
Light control plastic shell	See Annex A	No	0	P	
Any flame or glowing of the sample extinguished within 30 s of withdrawing the glow-wire, and any burning or molten drop did not ignite the underlying parts (Yes/No):					Yes
Supplementary information: --					

<b>1.16 (13.4)</b>	<b>TABLE: Proof tracking test (IEC 60112)</b>				<b>N/A</b>
Test voltage PTI .....		175V			—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
Supplementary information:					



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Clause	Requirement + Test	Result - Remark	Verdict
	<b>Screw terminals (part of the luminaire)</b>		<b>N/A</b>
<b>(14)</b>	<b>SCREW TERMINALS</b>		<b>N/A</b>
(14.2)	Type of terminal..... :	VDE approved	—
	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 (mm <sup>2</sup> )..... :		N/A
(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

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Clause	Requirement + Test	Result - Remark	Verdict
	<b>screwless terminals (part of the luminaire)</b>		N/A
<b>(15)</b>	<b>SCREWLESS TERMINALS</b>		<b>N/A</b>
(15.2)	Type of terminal.....:		—
	Rated current (A).....:		—
(15.3.1)	Material		N/A
(15.3.2)	Clamping		N/A
(15.3.3)	Stop		N/A
(15.3.4)	Unprepared conductors		N/A
(15.3.5)	Pressure on insulating material		N/A
(15.3.6)	Clear connection method		N/A
(15.3.7)	Clamping independently		N/A
(15.3.8)	Fixed in position		N/A
(15.3.10)	Conductor size		N/A
	Type of conductor		N/A
(15.5.1)	Terminals internal wiring		N/A
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples).....:		N/A
(15.5.1.2)	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
(15.6)	Electrical tests		
	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
(15.7)	Terminals external wiring		N/A
	Terminal size and rating		N/A
(15.8.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N).....:		N/A
	Pull test pin or tab terminals (4 samples); pull (N).....:		N/A
(15.9)	Contact resistance test		N/A
	Voltage drop (mV) after 1 h		N/A

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Clause	Requirement + Test									Verdict
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										
	Voltage drop of two inseparable joints									N/A
	Voltage drop after 10th alt. 25th cycle									N/A
	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									N/A
	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									N/A
	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									N/A
	Max. allowed voltage drop (mV) ..... :									—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										

Attachment 1: EN IEC60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
<b>ATTACHMENT TO TEST REPORT</b> <b>IEC 60598-2-1:2020</b> <b>EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES</b> Luminaires Part2: Particular requirements Section 1: Fixed general purpose luminaires			
<b>Differences according to</b> .....		EN IEC 60598-2-1:2021 used in conjunction with EN IEC 60598-1:2021+A11:2022	
<b>TRF template used</b> .....		IECEE OD-2020-F2:2020, Ed. 1.1	
<b>Attachment Form No.</b> .....		EU_GD_IEC60598_2_1H	
<b>Attachment Originator</b> .....		UL(Demko)	
<b>Master Attachment</b> .....		2022-04-08	
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	<b>CENELEC COMMON MODIFICATIONS (EN)</b>		P
<b>1.7 (4)</b>	<b>CONSTRUCTION</b>		N/A
1.7 (4.11.6)	Electro-mechanical contact systems		N/A
<b>1.11 (5)</b>	<b>EXTERNAL AND INTERNAL WIRING</b>		N/A
1.11 (5.2.2)	Cables equal to EN 50525		N/A
	Replace table 5.1 – Supply cord		N/A
<b>1.13 (12)</b>	<b>ENDURANCE TESTS AND THERMAL TESTS</b>		N/A
1.13 (12.4.2c)	Thermal test (normal operation) see footnote c to table 12.2 relating to unsleeved fixed wiring		N/A
<b>ZB</b>	<b>ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)</b>		N/A
(3.3)	DK: power supply cords of class I luminaires with label		N/A
(4.5.1)	DK: socket-outlets		N/A
(5.2.1)	CY, DK, FI, GB: type of plug		N/A
<b>ZC</b>	<b>ANNEX ZC, NATIONAL DEVIATIONS (EN)</b>		N/A
(4 & 5)	FR: Shuttered socket-outlets 10/16A		N/A
	FR: Safety requirements for high buildings (Decree of 30 December 2011 on safety regulations for the construction of high-rise buildings and their protection against fire and panic risks; Section VIII; Article GH 48, Lighting)  Glow-wire test for outer parts of luminaires:		N/A
	- 850°C for luminaires in stairways and horizontal travel paths		N/A
	- 650°C for indoor luminaires		N/A

**Attachment 1: EN IEC60598-2-1**

Clause	Requirement + Test	Result - Remark	Verdict
	GB: Requirements according to United Kingdom Building Regulation		N/A

Attachment 2: IEC 62031: 2008+A1+A2			
Clause	Requirement + Test	Result - Remark	Verdict
	<b>LED modules for general lighting – Safety specifications IEC 62031: 2008+A1+A2</b>		<b>P</b>
<b>13</b>	<b>FAULT CONDITIONS</b>		<b>P</b>
13.1	In compliance with EN 61347-1 (clause numbers between parentheses refer to EN 61347-1)		P
	When operated under fault conditions the LED-module:		P
	- does not emit flames or molten material		P
	- does not produce flammable gases		P
	- protection against accidental contact not impaired		P
	Thermally protected 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		N/A
- (14.1)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (except between live parts and accessible metal parts)		N/A
	Distances on printed boards provided with coating according to IEC 60664-3		N/A
- (14.2)	Short-circuit or interruption of semiconductor devices		N/A
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile		N/A
- (14.4)	Short-circuit across electrolytic capacitors		N/A
- (14.5)	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P
	After the tests the insulation resistance with d.c. 500 V (MΩ) are $\geq 1 \text{ M}\Omega$ .....	>100MΩ	P
	Temperature declared thermally protected LED-modules fulfil the requirements in Annex C of IEC 61437-1		N/A
13.2	Module withstands overpower condition >15 min.	(see appended table)	P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		N/A
	During the tests, tissue paper, spread below module, does not ignite		P

## Attachment 3: IEC/TR 62778:2014

Clause	Requirement + Test	Result - Remark	Verdict
	<b>Blue light hazard to light sources and luminaires of IEC/TR 62778:2014</b>		<b>P</b>
<b>7</b>	<b>Measurement information flow</b>		<b>P</b>
<b>7.1</b>	<b>Basic flow</b>		<b>P</b>
	'Law of conservation of luminance' applied		P
	Use of only true luminance/radiance values		P
	In case of luminaire: The light source is operated in the luminaire under similar conditions as when tested as a component		P
	In case $E_{thr}$ value for RG2 was established the peak value was derived from angular light distribution		N/A
<b>7.2</b>	<b>Conditions for the radiance measurement</b>		<b>P</b>
	Standard condition applied (200mm distance, 0,011 rad field of view)		P
	Non-standard condition applied		N/A
<b>7.3</b>	<b>Special cases (I): Replacement by a lamp or LED module of another type</b>		<b>N/A</b>
	Light source is a white light source		N/A
	Evaluation done based on highest luminance		N/A
	Evaluation done based on CCT value		N/A
<b>7.4</b>	<b>Special cases (II): Arrays and clusters of primary light sources</b>		<b>P</b>
	LED package is evaluated as .....	<input type="checkbox"/> RG0 unlimited <input checked="" type="checkbox"/> RG1 unlimited	P
	$E_{thr}$ of LED package applies to array		N/A
<b>8</b>	<b>RISK GROUP CLASSIFICATION</b>		<b>P</b>
	Risk group achieved:		P
	- ..Risk Group 0 unlimited		P
	- ..Risk Group 1 unlimited		N/A
	- $E_{thr}$ ..... (lx) : Distance to reach RG1 ..... (m) :		N/A
	<b>TABLE: Spectroradiometric measurement</b>		<b>P</b>
	Measurement performed on:	<input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input checked="" type="checkbox"/> Luminaire	<b>P</b>
	Model number .....	DURA69.150CM.1-10V.50W.NW	<b>P</b>
	Test voltage (V) .....	240Vac	—
	Test current (mA).....		—
	Test frequency (Hz) .....	--	—
	Ambient, t (°C) .....	26.3	—

**Attachment 3: IEC/TR 62778:2014**


Clause	Requirement + Test	Result - Remark		Verdict
	Measurement distance .....	<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm		—
	Source size .....	<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small : mm		—
	Field of view .....	<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)		—
Item	Symbol	Units	Result	Remark
Correlated colour temperature	CCT	K	3348	--
x/y colour coordinates	(x,y)	--	(0.3135,0.3435)	--
Blue light hazard radiance	L <sub>B</sub>	W/(m <sup>2</sup> •sr <sup>1</sup> )	1.31E+02	--
Blue light hazard irradiance	E <sub>B</sub>	W/m <sup>2</sup>	3.09e+01	--
Luminance	L	cd/m <sup>2</sup>	3.048e+006	--
Illuminance	E	lx	70264	--
Supplementary information: None				



**Attachment 4: IEC/EN 60598-2-24**

Clause	Requirement + Test	Result - Remark	Verdict
<b>24.3 (0)</b>	<b>GENERAL TEST REQUIREMENTS</b>		P
24.3 (0.3)	More sections applicable .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Section/s: IEC62031	—
24.3 (0.5)	Components	(see Annex 1)	—
<b>24.3 (0.7)</b>	<b>Information for luminaire design in light sources standards</b>		—
24.3 (0.7.2)	Light source safety standard .....	IEC62031	—
	Luminaire design in the light source safety standard		P
<b>24.5 (2)</b>	<b>CLASSIFICATION OF LUMINAIRES</b>		P
24.5 (2.2)	Type of protection .....	Class I	P
24.5 (2.3)	Degree of protection .....	IP69K	—
24.5 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
24.5 (2.5)	Luminaire for normal use .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Luminaire for rough service .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
24.5 (-)	a) Luminaire where no unusual accumulation of dust is expected		—
	b) Luminaire where an accumulation of non-conductive dust may be expected		—
	c) Luminaire where an accumulation of conductive dust may be expected		—
<b>24.6 (3)</b>	<b>MARKING</b>		P
24.6 (3.2)	Mandatory markings		P
	Position of the marking	On the enclosure	P
	Format of symbols/text	See marking plate	P
24.6 (3.3)	Additional information		P
	Language of instructions	English	P
24.6 (3.3.1)	Combination luminaires		N/A
24.6 (3.3.2)	Nominal frequency in Hz	50/60Hz	P
24.6 (3.3.3)	Operating temperature		N/A
24.6 (3.3.5)	Wiring diagram		N/A
24.6 (3.3.6)	Special conditions		N/A
24.6 (3.3.7)	Metal halide lamp luminaire – warning		N/A
24.6 (3.3.8)	Limitation for semi-luminaires		N/A
24.6 (3.3.9)	Power factor and supply current		N/A
24.6 (3.3.10)	Suitability for use indoors		N/A
24.6 (3.3.11)	Luminaires with remote control		N/A
24.6 (3.3.12)	Clip-mounted luminaire – warning		N/A
24.6 (3.3.13)	Specifications of protective shields		N/A

**Attachment 4: IEC/EN 60598-2-24**

Clause	Requirement + Test	Result - Remark	Verdict
24.6 (3.3.14)	Symbol for nature of supply	~	P
24.6 (3.3.15)	Rated current of socket outlet		N/A
24.6 (3.3.16)	Rough service luminaire		N/A
24.6 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments	Type Y	P
24.6 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A
24.6 (3.3.19)	Protective conductor current in instruction if applicable		N/A
24.6 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
24.6 (3.3.21)	Non replaceable and non-user replaceable light sources information provided	Non-user replaceable light sources	P
24.6 (3.3.22)	Controllable luminaires, classification of insulation provided	See marking plate	P
24.6 (3.3.23)	Luminaires without control gear provided with necessary information for selection of appropriate component		P
24.6 (3.3.24)	If not supplied with terminal block, information on the packaging		N/A
24.6 (3.3.25)	Luminaires employing light sources emitting UV on mains wiring, information provided		N/A
24.6 (3.3.26)	Wall mounted luminaire using external flexible cable or cord longer than 0.3 m, information provided		N/A
24.6 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P
24.6.1 (-)	Symbol for luminaire with limited surface temp.		P
	Marking visible		P
24.6.2 (-)	Classification of the luminaire according 24.5 in manufacturers literature		P
<b>24.7 (4)</b>	<b>CONSTRUCTION</b>		P
24.7 (4.2)	Components replaceable without difficulty		N/A
24.7 (4.3)	Wireways smooth and free from sharp edges		P
<b>24.7 (4.4)</b>	<b>Lamp holders</b>		<b>N/A</b>
24.7 (4.4.1)	Integral lamp holder		N/A
24.7 (4.4.2)	Wiring connection		N/A
24.7 (4.4.3)	Lamp holder for end-to-end mounting		N/A
24.7 (4.4.4)	Positioning		N/A
	- pressure test (N) .....		—

Attachment 4: IEC/EN 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
	After test the lamp holder comply with relevant standard sheets and show no damage		N/A
	After test on single-capped lamp holder the lamp holder has not moved from its position and show no permanent deformation		N/A
	- bending test (N) .....		—
	After test the lamp holder has not moved from its position and show no permanent deformation		N/A
24.7 (4.4.5)	Peak pulse voltage		N/A
24.7 (4.4.6)	Centre contact		N/A
24.7 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A
24.7 (4.4.8)	Lamp connectors		N/A
24.7 (4.4.9)	Caps and bases correctly used		N/A
24.7 (4.4.10)	Light source for lamp holder or connection according IEC 60061 not connected another way		N/A
<b>24.7 (4.5)</b>	<b>Starter holders</b>		N/A
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
<b>24.7 (4.6)</b>	<b>Terminal blocks</b>		P
	Tails		P
	Unsecured blocks		P
<b>24.7 (4.7)</b>	<b>Terminals and supply connections</b>		<b>P</b>
24.7 (4.7.1)	Contact to metal parts		P
24.7 (4.7.2)	Test 8 mm live conductor		N/A
	Test 8 mm earth conductor		N/A
24.7 (4.7.3)	Terminals for supply conductors		P
24.7 (4.7.3.1)	Welded method and material		N/A
	- stranded or solid conductor		N/A
	- spot welding		N/A
	- welding between wires		N/A
	- Type Z attachment		N/A
	- mechanical test according to 15.6.2		N/A
	- electrical test according to 15.6.3		N/A
	- heat test according to 15.6.3.2.3 and 15.6.3.2.4		N/A
24.7 (4.7.4)	Terminals other than supply connection		P
24.7 (4.7.5)	Heat-resistant wiring/sleeves		N/A
24.7 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A

Attachment 4: IEC/EN 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
<b>24.7 (4.8)</b>	<b>Switches</b>		N/A
	- adequate rating		N/A
	- adequate fixing		N/A
	- polarized supply		N/A
	- compliance with IEC 61058-1 for electronic switches		N/A
<b>24.7 (4.9)</b>	<b>Insulating lining and sleeves</b>		N/A
24.7 (4.9.1)	Retainment		N/A
	Method of fixing .....		N/A
24.7 (4.9.2)	Insulated linings and sleeves:		N/A
	Resistant to a temperature > 20 °C to the wire temperature or		N/A
	a) & c) Insulation resistance and electric strength		N/A
	b) Ageing test. Temperature (°C) .....		N/A
<b>24.7 (4.10)</b>	<b>Double or reinforced insulation</b>		N/A
24.7 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		N/A
	Safe installation fixed luminaires		N/A
	Capacitors and switches		N/A
24.7 (4.10.2)	Assembly gaps:		N/A
	- not coincidental		N/A
	- no straight access with test probe		N/A
24.7 (4.10.3)	Retainment of insulation:		N/A
	- fixed		N/A
	- unable to be replaced; luminaire inoperative		N/A
	- sleeves retained in position		N/A
	- lining in lamp holder		N/A
24.7 (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
<b>24.7 (4.11)</b>	<b>Electrical connections and current-carrying parts</b>		P
24.7 (4.11.1)	Contact pressure		P
24.7 (4.11.2)	Screws:		N/A

**Attachment 4: IEC/EN 60598-2-24**

Clause	Requirement + Test	Result - Remark	Verdict
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
24.7 (4.11.3)	Screw locking:		P
	- spring washer		P
	- rivets		N/A
24.7 (4.11.4)	Material of current-carrying parts		P
24.7 (4.11.5)	No contact to wood or mounting surface		P
24.7 (4.11.6)	Electro-mechanical contact systems		N/A
<b>24.7 (4.12)</b>	<b>Screws and connections (mechanical) and glands</b>		<b>P</b>
24.7 (4.12.1)	Screws not made of soft metal		N/A
	Screws of insulating material		N/A
	Torque test: torque (Nm); part..... :	Screw fixed terminal blocks: 1.2 Nm	P
	Torque test: torque (Nm); part..... :	Screw fixed LED driver: 1.2 Nm	P
	Torque test: torque (Nm); part..... :	Screw fixed plastic enclosure: 2.0 Nm	P
24.7 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
24.7 (4.12.4)	Locked connections:		P
	- fixed arms; torque (Nm) .....		N/A
	- lamp holder; torque (Nm) .....		N/A
	- push-button switches; torque 0,8 Nm .....		N/A
24.7 (4.12.5)	Screwed glands; force (Nm)..... :	Screwed plastic gland: 7.5Nm	P
<b>24.7 (4.13)</b>	<b>Mechanical strength</b>		<b>P</b>
24.7 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm) .....		N/A
	- other parts; energy (Nm) .....	All other parts(enclosure, cord, LED driver, and so on), 0.35Nm	P
	1) live parts		P
	2) linings		N/A
	3) protection		P
	4) covers		P
24.7 (4.13.2)	Metal parts have adequate mechanical strength		P
24.7 (4.13.3)	Straight test finger		N/A
24.7 (4.13.4)	Rough service luminaires		N/A
	- IP54 or higher		N/A
	a) fixed		N/A
	b) hand-held		N/A
	c) delivered with a stand		N/A

**Attachment 4: IEC/EN 60598-2-24**

Clause	Requirement + Test	Result - Remark	Verdict
	d) for temporary installations and suitable for mounting on a stand		N/A
24.7 (4.13.6)	Tumbling barrel		N/A
<b>24.7 (4.14)</b>	<b>Suspensions, fixings and means of adjusting</b>		<b>P</b>
24.7 (4.14.1)	Mechanical load:		P
	A) four times the weight		P
	B) torque 2,5 Nm		P
	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
24.7 (4.14.2)	Load to flexible cables		N/A
	Mass (kg) .....		—
	Stress in conductors (N/mm <sup>2</sup> ) .....		N/A
	Mass (kg) of semi-luminaire .....		N/A
	Bending moment (Nm) of semi-luminaire .....		N/A
24.7 (4.14.3)	Adjusting devices:		N/A
	- flexing test; number of cycles..... :		N/A
	- strands broken .....		N/A
	- electric strength test afterwards		N/A
24.7 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
24.7 (4.14.5)	Guide pulleys		N/A
24.7 (4.14.6)	Strain on socket-outlets		N/A
<b>24.7 (4.15)</b>	<b>Flammable materials</b>		<b>P</b>
	- glow-wire test 650°C .....	See Test Table 24.15 (13.3.2)	N/A
	- spacing $\geq 30$ 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
24.7 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		N/A
	a) construction		N/A
	b) temperature sensing control		N/A

Attachment 4: IEC/EN 60598-2-24			
Clause	Requirement + Test	Result - Remark	Verdict
	c) surface temperature		N/A
<b>24.7 (4.16)</b>	<b>Luminaires for mounting on normally flammable surfaces</b>		<b>P</b>
	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
24.7 (4.16.1)	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
24.7 (4.16.2)	Thermal protection:		N/A
	- in lamp control gear		N/A
	- external		N/A
	- fixed position		N/A
	- temperature marked lamp control gear		N/A
24.7 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N/A
<b>24.7 (4.17)</b>	<b>Drain holes</b>		N/A
	Clearance at least 5 mm		N/A
<b>24.7 (4.18)</b>	<b>Resistance to corrosion</b>		<b>P</b>
24.7 (4.18.1)	- rust-resistance		P
24.7 (4.18.2)	- season cracking in copper		P
24.7 (4.18.3)	- corrosion of aluminium		P
24.7 (4.19)	Igniters compatible with ballast		N/A
24.7 (4.20)	Rough service vibration		N/A
<b>24.7 (4.21)</b>	<b>Protective shield</b>		N/A
24.7 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A
	Shield of glass if tungsten halogen lamps		N/A
24.7 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
24.7 (4.21.3)	No direct path		N/A
24.7 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment..... :	See Test Table 24.16 (13.3.2)	N/A
24.7 (4.22)	Attachments to lamps not cause overheating or damage		N/A
24.7 (4.23)	Semi-luminaires comply Class II		N/A
<b>24.7 (4.24)</b>	<b>Photobiological hazards</b>		<b>P</b>
24.7 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N/A
24.7 (4.24.2)	Retinal blue light hazard		P

**Attachment 4: IEC/EN 60598-2-24**

Clause	Requirement + Test	Result - Remark	Verdict
	Class of risk group assessed according to IEC/TR 62778 .....		—
	Luminaires with $E_{thr}$ :		P
	a) Fixed luminaires		P
	- distance x m, borderline between RG1 and RG2 :		P
	- marking and instruction according 3.2.23		P
	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
<b>24.7 (4.25)</b>	<b>Mechanical hazard</b>		<b>P</b>
	No sharp point or edges		P
<b>24.7 (4.26)</b>	<b>Short-circuit protection</b>		<b>N/A</b>
24.7 (4.26.1)	Adequate means of uninsulated accessible SELV / PELV parts		N/A
24.7 (4.26.2)	Short-circuit test with test chain according 4.26.3:		N/A
	Supply source ES1 PSE		N/A
	Test chain not melt through		N/A
	Test sample not exceed values of Table 12.1 and 12.2		N/A
<b>24.7 (4.27)</b>	<b>Terminal blocks with integrated screwless protective earthing contacts</b>		<b>N/A</b>
	Test according Annex V		N/A
	Pull test of terminal fixing (20 N)		N/A
	After test, resistance < 0,05 $\Omega$		N/A
	Pull test of mechanical connection (50 N)		N/A
	After test, resistance < 0,05 $\Omega$		N/A
	Voltage drop test, resistance < 0,05 $\Omega$		N/A
<b>24.7 (4.28)</b>	<b>Fixing of thermal sensing control</b>		<b>N/A</b>
	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 ( $^{\circ}\text{C}$ ) .....		—
	100 cycles between $t_{min}$ and $t_{max}$		N/A
	Temperature sensing control still in position		N/A



## Attachment 4: IEC/EN 60598-2-24

Clause	Requirement + Test	Result - Remark	Verdict
<b>24.7 (4.29)</b>	<b>Luminaires with non-replaceable light source</b>		<b>N/A</b>
	Not possible to replace light source		N/A
	Live part not accessible after parts have been opened by hand or tools		N/A
<b>24.7 (4.30)</b>	<b>Luminaires with non-user replaceable light source</b>		<b>P</b>
	If protective cover provide protection against electric shock and marked with "caution, electric shock risk" symbol:		P
	At least one fixing means requiring use of tool		P
<b>24.7 (4.31)</b>	<b>Insulation between circuits</b>		<b>P</b>
	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
24.7 (4.31.1)	<b>SELV or PELV circuits</b>		<b>P</b>
	Used SELV/PELV source		N/A
	Voltage ≤ ELV		P
	Insulating of SELV/PELV circuits from LV supply		P
	Insulating of SELV/PELV circuits from other non SELV/PELV circuits		N/A
	Insulating of SELV/PELV circuits from FELV		P
	Insulating of SELV/PELV circuits from other SELV/PELV circuits		N/A
	SELV/PELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to make any electrical contact with 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
24.7 (4.31.2)	<b>FELV circuits</b>		<b>N/A</b>
	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 make any electrical contact with socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Socket-outlets does not have protective conductor contact		N/A
24.7 (4.31.3)	Other circuits		N/A
	Other circuits insulated from accessible parts according Table X.1		N/A
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		N/A
	- conductive parts are connected together		N/A
	- test according 7.2.3		N/A
	- conductive part not cause an electric shock in case of an insulation fault		N/A
	- equipotential bonding in master/slave applications		N/A
	- master luminaire provided with terminal for accessible conductive parts of slave luminaires		N/A
	- slave luminaire constructed as class I		N/A
<b>24.7 (4.32)</b>	<b>Overvoltage protective devices</b>		N/A
	Comply with IEC 61643-11		N/A
	External to controlgear and connected to earth:		N/A
	- only in fixed luminaires		N/A
	- only connected to protective earth		N/A
<b>24.7 (4.33)</b>	<b>Luminaire powered via information technology communication cabling</b>		N/A
	Requirements for Class III luminaire		N/A
	Rated voltage within the range of ES1 and does not exceed maximum voltage of used connector		N/A
	Luminaire does not create any hazard from overvoltage	(see Annex 2)	N/A
<b>24.7 (4.34)</b>	<b>Electromagnetic fields (EMF)</b>		N/A
	No harmful electromagnetic fields		N/A
<b>24.7 (4.35)</b>	<b>Protection against moving fan blades</b>		N/A
	Test with a standard test finger		N/A
	Test with test probe acc. to Figure 13 (IEC 61032) for portable luminaire		N/A
	Blades rounded with radius $\geq 0.5$ mm and:		N/A
	-hardness less than D60 Shore		N/A
	-peripheral speed less than 15 m/s		N/A
	-input power of fan $\leq 2$ W at rated voltage		N/A
<b>24.7 (4.36)</b>	<b>Track-mounted luminaires</b>		N/A
	Test in accordance with Annex A of IEC60570:2003/AMD2:2019		N/A
<b>24.7.1 (-)</b>	<b>Degree of protection</b>		P

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Clause	Requirement + Test	Result - Remark	Verdict
	IP4X at least	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	IP5X if presence of dust	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	IP6X if presence of conductive dust	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	At least IP 5X or IP6X for certain locations according IEC 60364-4-42		P
<b>24.7.2 (-)</b>	<b>Applicable surfaces comply with requirements of horizontal surfaces</b>		P
	Vertical surfaces not complying with spacing requirements in 24.13 comply with the limits for horizontal surfaces		P

24.8 (11)	<b>CREEPAGE DISTANCES AND CLEARANCES</b>		P
24.8 (11.2.1)	Impulse withstand category (Normal category II)	Category II <input checked="" type="checkbox"/> Category III <input type="checkbox"/>	—
	Category III according Annex U		N/A
	Protected against pollution, reduced creepage and clearance according Annex P of IEC 61347-1		N/A
24.8 (11.2.2)	Creepage distances for frequency up to 30 kHz	See Test Table 24.8 (11.2) I	P
	Creepage distances for frequency over 30 kHz:		N/A
	- Controlgear marked with $\hat{U}_{OUT}$ and $f_{UOUT}$ according IEC 61347-1, clause 7.1, item w	See Test Table 24.8 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 24.8 (11.2) II	N/A
24.8 (11.2.3)	Clearances for frequency up to 30 kHz	See Test Table 24.8 (11.2) I	P
	Clearances distances for frequency over 30 kHz:		N/A
	- Controlgear marked with $U_p$	See Test Table 24.8 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 24.8 (11.2) II	N/A

24.9 (7)	<b>PROVISION FOR EARTHING</b>		P
24.9 (7.2.1 + 7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		P
	Resistance < 0,5 $\Omega$ ..... :	0.025 $\Omega$	P
	Self-tapping screws used		N/A
	Thread-forming screws		P
	Thread-forming screw used in a groove		P
	Protective earth makes contact first		P
	Terminal blocks with integrated screwless protective earthing contacts tested according Annex V		N/A
	Protective earthing of the luminaire not via built-in control gear		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
24.9 (7.2.2 + 7.2.3)	Protective earth continuity in joints, etc.		N/A
24.9 (7.2.4)	Locking of clamping means		P
	Compliance with 4.7.3		P
24.9 (7.2.5)	Protective earth terminal integral part of connector socket		N/A
24.9 (7.2.6)	Protective earth terminal adjacent to mains terminals		P
24.9 (7.2.7)	Electrolytic corrosion of the protective earth terminal		P
24.9 (7.2.8)	Material of protective earth terminal		P
	Contact surface bare metal		P
24.9 (7.2.10)	Class II luminaire for looping-in		N/A
	Double or reinforced insulation to functional earth		N/A
24.9 (7.2.11)	Protective earthing core coloured green-yellow		P
	Length of earth conductor		P
24.9 (7.2.12)	PELV circuit connected to protective earth for functional purpose		P
<b>24.10 (14)</b>	<b>SCREW TERMINALS</b>		N/A
	Separately approved; component list..... :	(see Annex 1)	N/A
	Part of the luminaire..... :	(see Annex 3)	N/A
<b>24.10 (15)</b>	<b>SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS</b>		N/A
	Separately approved; component list..... :	(see Annex 1)	N/A
	Part of the luminaire..... :	(see Annex 4)	N/A
<b>24.11 (5)</b>	<b>EXTERNAL AND INTERNAL WIRING</b>		<b>P</b>
<b>24.11 (5.2)</b>	<b>Supply connection and external wiring</b>		<b>P</b>
24.11 (5.2.1)	Means of connection..... :		P
	Outdoor luminaire has not PVC insulated external wiring if not Class III or SELV/PELV circuits $\leq 25$ V AC/60 V DC/25 V peak interrupted DC voltage with frequency 10Hz -200 Hz or protected from outdoor environment		N/A
24.11 (5.2.2)	Type of cable..... :		P
	Nominal cross-sectional area (mm <sup>2</sup> )..... :		P
	Cables equal to IEC 60227 or IEC 60245		N/A
24.11 (5.2.3)	Type of attachment, X, Y or Z		P
24.11 (5.2.5)	Type Z not connected to screws		P
24.11 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P

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Clause	Requirement + Test	Result - Remark	Verdict
24.11 (5.2.7)	Cable entries through rigid material have rounded edges		P
24.11 (5.2.8)	Insulating bushings:		P
	- suitably fixed		P
	- material in bushings		P
	- material not likely to deteriorate		N/A
	- tubes or guards made of insulating material		P
24.11 (5.2.9)	Locking of screwed bushings		N/A
24.11 (5.2.10)	Cord anchorage:		P
	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		P
	- no tying of cables into knots etc.		N/A
	- insulating material or lining		P
24.11 (5.2.10.1)	Cord anchorage for type X attachment:		N/A
	a) at least one part fixed		N/A
	b) types of cable		N/A
	c) no damaging of the cable		N/A
	d) whole cable can be mounted		N/A
	e) no touching of clamping screws		N/A
	f) metal screw not directly on cable		N/A
	g) replacement without special tool		N/A
	Glands not used as anchorage		N/A
	Labyrinth type anchorages		N/A
24.11 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		P
24.11 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N)..... : 80N		P
	- torque test: torque (Nm) ..... : 0.35Nm		P
	- displacement $\leq$ 2 mm	1.22mm	P
	- no movement of conductors		P
	- no damage of cable or cord		P
	- function independent of electrical connection		P
24.11 (5.2.10.4)	Luminaire with/designed for use with supply cord with maximum current of 2A:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- Ordinary Class III luminaire supplied with SELV $\leq 25V$ RMS/60V DC		N/A
	- Ordinary Class III luminaire supplied with PELV $\leq 12V$ RMS/30V DC		N/A
	- Other than ordinary Class III luminaire supplied with voltage $\leq 12V$ RMS/30V DC		N/A
	Pull test of 30N		N/A
24.11 (5.2.11)	External wiring passing into luminaire		P
24.11 (5.2.12)	Looping-in terminals		N/A
24.11 (5.2.13)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		P
24.11 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A
24.11 (5.2.15)	Connectors for Class III luminaires (IEC 60603 or IEC 62680)		N/A
24.11 (5.2.16)	Appliance inlets (IEC 60320)		N/A
	Installation couplers (IEC 61535)		N/A
	Appliance inlet or connector systems (IEC 61984)		N/A
24.11 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
24.11 (5.2.18)	Used plug in accordance with		N/A
	- IEC 60083		N/A
	- other standard		N/A
<b>24.11 (5.3)</b>	<b>Internal wiring</b>		<b>P</b>
24.11 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		N/A
	- not delivered/ mounting instruction		N/A
	- factory assembled		N/A
	- socket outlet loaded (A) ..... :		N/A
	- temperatures ..... :	(see Annex 2)	N/A
	Green-yellow for protective earth only		N/A
24.11 (5.3.1.1)	Internal wiring connected directly to fixed wiring		N/A
	Cross-sectional area (mm <sup>2</sup> )..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Insulation thickness (mm) .....		N/A
	Extra insulation added where necessary		N/A
24.11 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		N/A
	Cross-sectional area (mm <sup>2</sup> ).....		N/A
24.11 (5.3.1.3)	Double or reinforced insulation for class II		N/A
24.11 (5.3.1.4)	Conductors without insulation		N/A
24.11 (5.3.1.5)	SELV/PELV current-carrying parts		N/A
24.11 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
24.11 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N/A
	Joints, raising/lowering devices		N/A
	Telescopic tubes etc.		N/A
	No twisting over 360°		N/A
24.11 (5.3.3)	Insulating bushings:		N/A
	- suitable fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- cables with protective sheath		N/A
24.11 (5.3.4)	Joints and junctions effectively insulated		N/A
24.11 (5.3.5)	Strain on internal wiring		N/A
24.11 (5.3.6)	Wire carriers		N/A
24.11 (5.3.7)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		N/A
<b>24.11 (5.4)</b>	<b>Test to determine suitability of conductors having a reduced cross-sectional area</b>		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
<b>24.12 (8)</b>	<b>PROTECTION AGAINST ELECTRIC SHOCK</b>		<b>P</b>
24.12 (8.2.1)	Live parts not accessible		P
	Basic insulated parts not used on the outer surface without appropriate protection		P
	Basic insulated parts not accessible with standard test finger on portable, settable and adjustable luminaires		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires		P
	Lamp and starter holders 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		P
	Double-ended high-pressure discharge lamp		N/A
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
24.12 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
24.12 (8.2.3.a)	Class II luminaire:		N/A
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A
	- basic insulation not accessible other than during starter or lamp replacement		N/A
	- glass protective shields not used as supplementary insulation		N/A
24.12 (8.2.3.b)	BC lamp holder of metal in class I luminaires shall be connected to protective earth		N/A
24.12 (8.2.3.c)	SELV circuits with exposed current carrying parts:		P
	Ordinary luminaire:		N/A
	- voltage under load/ no-load AC (V)..... :		N/A
	- voltage under load/ no-load DC (V) .....		N/A
	- interrupted DC voltage (V) .....		N/A
	- touch current if applicable (mA) .....		N/A
	One conductive part insulated if required		N/A
	Other than ordinary luminaire:		N/A
	- voltage under load/ no-load AC (V)..... :		N/A
	- voltage under load/ no-load DC (V) .....		N/A
	- interrupted DC voltage (V) .....		N/A
	Class III luminaire only for connection to SELV		N/A
	Class III luminaire not provided with means for protective earthing		N/A
24.12 (8.2.3.d)	PELV circuits with exposed current carrying parts:		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	Ordinary luminaire:		N/A
	- voltage under load/ no-load AC (V)..... :		N/A
	- voltage under load/ no-load DC (V) ..... :		N/A
	Other than ordinary luminaire:		N/A
	- voltage under load/ no-load AC (V)..... :		N/A
	- voltage under load/ no-load DC (V) ..... :		N/A
	One pole insulated if required		N/A
24.12 (8.2.4)	Portable luminaire has protection independent of supporting surface		N/A
24.12 (8.2.5)	Compliance with the standard test finger or relevant probe		P
24.12 (8.2.6)	Covers reliably secured		P
24.12 (8.2.7)	Luminaire other than below with capacitor > 0,5 $\mu$ F not exceed 50 V 1 min after disconnection		P
	Portable luminaire with capacitor > 0,1 $\mu$ F (0.25) not exceed 34 V 1 s after disconnection		N/A
	Other luminaires with capacitor > 0,1 $\mu$ F (0.25) with plug and track adaptors not exceed 60 V 5 s after disconnection		N/A
<b>24.13 (12)</b>	<b>ENDURANCE TEST AND THERMAL TEST</b>		<b>P</b>
24.13 (-)	Test of (12.4), (12.5), (12.6) and (12.7) after (9.2) before (9.3) as specified in 24.14		—
<b>24.13 (12.2)</b>	<b>Selection of lamps and ballasts</b>		—
	Lamp used according Annex B	(Lamp used see Annex 2)	—
	Control gear if separate and not supplied	(Control gear used see Annex 2)	—
<b>24.13 (12.3)</b>	<b>Endurance test</b>		<b>P</b>
	a) mounting-position ..... :	Normal mounting position	—
	b) test temperature ( $^{\circ}$ C)..... :	Ta+10 $^{\circ}$ C	—
	c) total duration (h) ..... :	240h	—
	d) supply voltage (V) ..... :	264V	—
	d) if not equipped with control gear, constant voltage/current (V) or (A) ..... :		—
24.13 (12.3.1d)	d) Class III luminaires powered via information technology communication cable:		N/A
	- voltage under normal operation (V) ..... :		—
	- voltage under abnormal operation (V) ..... :		—
	e) luminaire ceases to operate		—
	f) luminaire with constant light output function		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
24.13 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N/A
	- marking legible		P
	- no cracks, deformation etc.		P
<b>24.13 (12.4)</b>	<b>Thermal test (normal operation)</b>	(see Annex 2)	P
<b>24.13 (12.5)</b>	<b>Thermal test (abnormal operation)</b>	(see Annex 2)	P
<b>24.13 (12.6)</b>	<b>Thermal test (failed lamp control gear condition):</b>		N/A
24.13 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A) .....		—
	- case of abnormal conditions .....		—
	- electronic lamp control gear		N/A
	- measured winding temperature (°C): at 1,1 Un ...		—
	- measured mounting surface temperature (°C) at 1,1 Un .....		N/A
	- calculated mounting surface temperature (°C) ...		N/A
	- track-mounted luminaires		N/A
24.13 (12.6.2)	Temperature sensing control		N/A
	- case of abnormal conditions .....		—
	- thermal link		N/A
	- manual reset cut-out		N/A
	- auto reset cut-out		N/A
	- measured mounting surface temperature (°C) ...		N/A
	- track-mounted luminaires		N/A
<b>24.13 (12.7)</b>	<b>Thermal test (failed lamp control gear in plastic luminaires):</b>		N/A
24.13 (12.7.1)	Luminaire without temperature sensing control		N/A
24.13 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N/A
	Test method 12.7.1.1 or Annex W .....		—
	Test according to 12.7.1.1:		N/A
	- case of abnormal conditions .....		—
	- Ballast failure at supply voltage (V) .....		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
	Test according to Annex W:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- case of abnormal conditions .....		—
	- measured winding temperature (°C): at 1,1 Un ... :		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un .....		—
	- calculated temperature of fixing point/exposed part (°C) .....		—
	Ball-pressure test .....	See Test Table 24.16 (13.2.1)	N/A
24.13 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N/A
	- case of abnormal conditions .....		—
	- measured winding temperature (°C): at 1,1 Un ... :		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un .....		—
	- calculated temperature of fixing point/exposed part (°C) .....		—
	Ball-pressure test .....	See Test Table 24.16 (13.2.1)	N/A
24.13 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N/A
	- case of abnormal conditions .....		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
24.13 (12.7.2)	Luminaire with temperature sensing control		N/A
	- thermal link .....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- manual reset cut-out .....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- auto reset cut-out .....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- case of abnormal conditions .....		—
	- highest measured temperature of fixing point/exposed part (°C): .....		—
	Ball-pressure test: .....	See Test Table 24.16 (13.2.1)	N/A
24.13 (-)	Temperature limit for vertical surfaces with gap < 30 mm	(see Annex 2)	N/A
24.13.1 (-)	Special temperature limits – normal operation	(see Annex 2)	N/A
24.13.2 (-)	Special temperature limits – abnormal operation	(see Annex 2)	N/A
24.13.3 (-)	Special temperature limits – fault conditions	(see Annex 2)	N/A
24.14 (9)	<b>RESISTANCE TO DUST AND MOISTURE</b>		P
24.14 (-)	Order of tests as specified in clause 24.13		N/A
24.14 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP .....	IP69K	—

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Clause	Requirement + Test	Result - Remark	Verdict
	- mounting position during test .....	Normal mounting position	—
	- fixing screws tightened; torque (Nm) .....	—	—
	- tests according to clauses .....	Clause 9.2.2 & 9.2.10	—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N/A
	b) no talcum in dust-tight luminaire		P
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		N/A
	c.1) For luminaires without drain holes – no water entry		N/A
	c.2) For luminaires with drain holes – no hazardous water entry		N/A
	d) no water in watertight, pressure watertight, high pressure and temperature water jet-proof or high pressure and cold water jet-proof luminaire		N/A
	e) no contact with live parts (IP 2X)		N/A
	e) no entry into enclosure (IP 3X and IP 4X)		N/A
	e) no contact with live parts through drain holes and ventilation slots (IP3X and IP4X)		N/A
	f) no trace of water on part of lamp requiring protection from splashing water		N/A
	g) no damage of protective shield or glass envelope		N/A
24.14 (9.3)	Humidity test 48 h	25%; 93%R.H.; 48h	P
<b>24.15 (10)</b>	<b>INSULATION RESISTANCE AND ELECTRIC STRENGTH</b>		P
24.15 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø .....		—
	Insulation resistance (MΩ):		N/A
	SELV/PELV:		N/A
	- between current-carrying parts of different polarity .....		N/A
	- between current-carrying parts and mounting surface .....	100MΩ [required 1MΩ]	P
	- between current-carrying parts and metal parts of the luminaire.....	100MΩ [required 1MΩ]	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts.....		N/A
	- Insulation bushings as described in Section 5 .....		N/A
	Other than SELV/PELV:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- between live parts of different polarity .....		N/A
	- between live parts and mounting surface .....		N/A
	- between live parts and metal parts .....		N/A
	- between live parts of different polarity through action of a switch.....		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts.....		N/A
	- Insulation bushings as described in Section 5 .....		N/A
24.15 (10.2.2)	Electric strength test		P
	Dummy lamp		N/A
	Luminaires with ignitors after 24 h test		N/A
	Luminaires with manual ignitors		N/A
	Test voltage (V):		P
	SELV/PELV:		P
	- between current-carrying parts of different polarity :		N/A
	- between current-carrying parts and mounting surface .....	1480V	P
	- between current-carrying parts and metal parts of the luminaire.....	1480V	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts.....		N/A
	- Insulation bushings as described in Section 5 .....		N/A
	Other than SELV/PELV:		N/A
	- between live parts of different polarity .....		N/A
	- between live parts and mounting surface .....		N/A
	- between live parts and metal parts .....		N/A
	- between live parts of different polarity through action of a switch.....		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts.....		N/A
	- Insulation bushings as described in Section 5 .....		N/A
24.15 (10.3)	Touch current (mA) .....	Max. 0,08mA (limit 0,7mA)	P
	Protective conductor current (mA) .....	Protective conductor current: Max. 0,25mA (limit 3,5mA)	P
<b>24.16 (13)</b>	<b>RESISTANCE TO HEAT, FIRE AND TRACKING</b>		P
24.16 (13.2.1)	Ball-pressure test..... :	See Test Table 24.16 (13.2.1)	P

**Attachment 4: IEC/EN 60598-2-24**

Clause	Requirement + Test	Result - Remark	Verdict
24.16 (13.3.1)	Needle-flame test (10 s) .....	See Test Table 24.16 (13.3.1)	P
24.16 (13.3.2)	Glow-wire test (650°C) .....	See Test Table 24.16 (13.3.2)	P
24.16 (13.4)	Proof tracking test (IEC 60112) .....	See Test Table 24.16 (13.4)	P



Fig. 1: Overview of model DURA69.150CM.1-10V.50W.NW



Fig. 2: Overview of model Dura69.60CM.1-10V.21W.NW



Fig. 3: Overview of model Dura69.60CM.1-10V.21W.NW

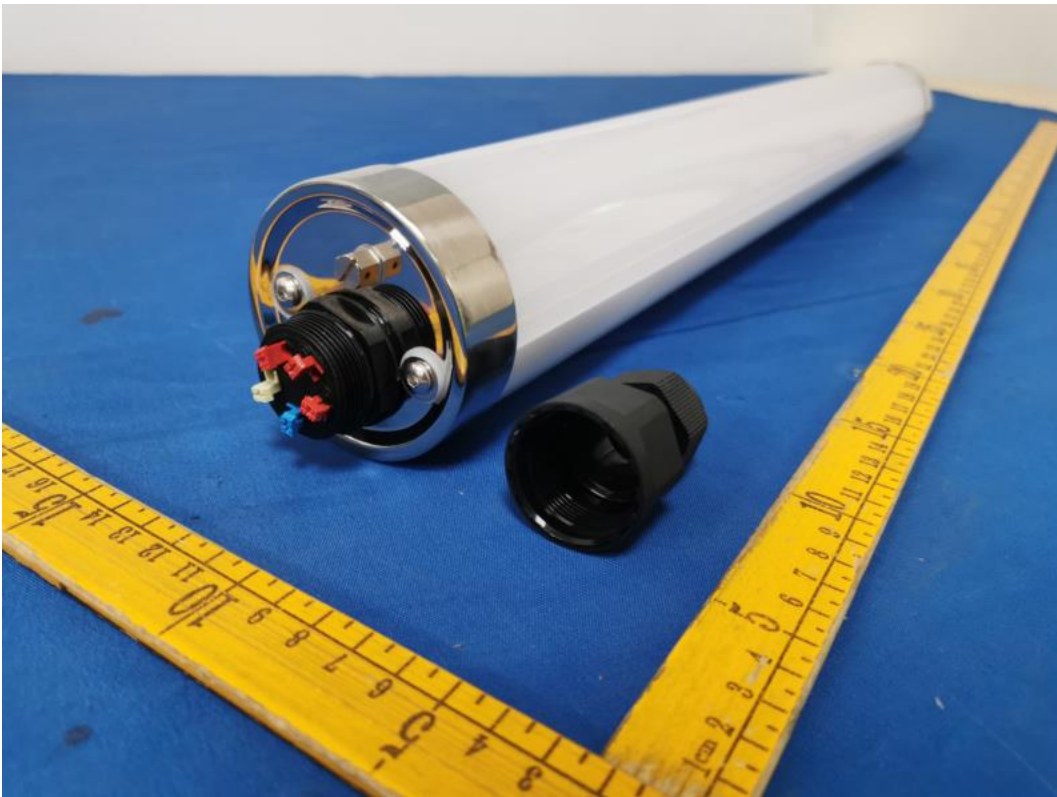


Fig. 4: Overview of model Dura69.60CM.1-10V.21W.NW



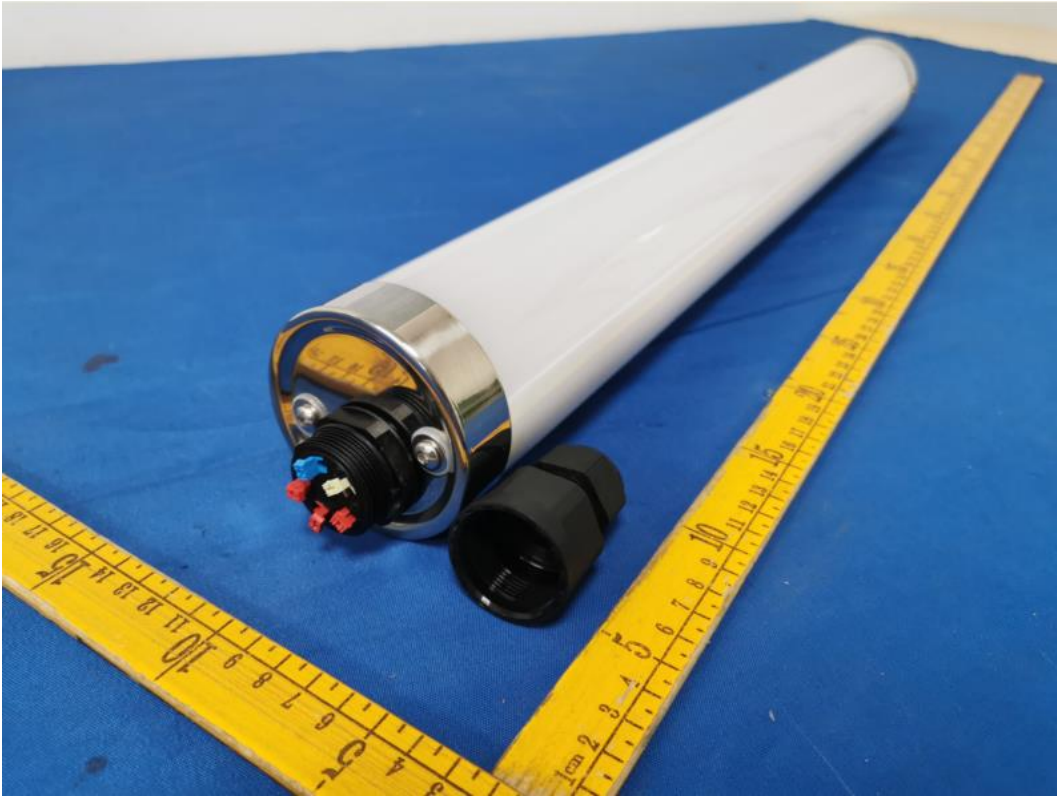


Fig. 5: Overview of model Dura69.60CM.1-10V.21W.NW

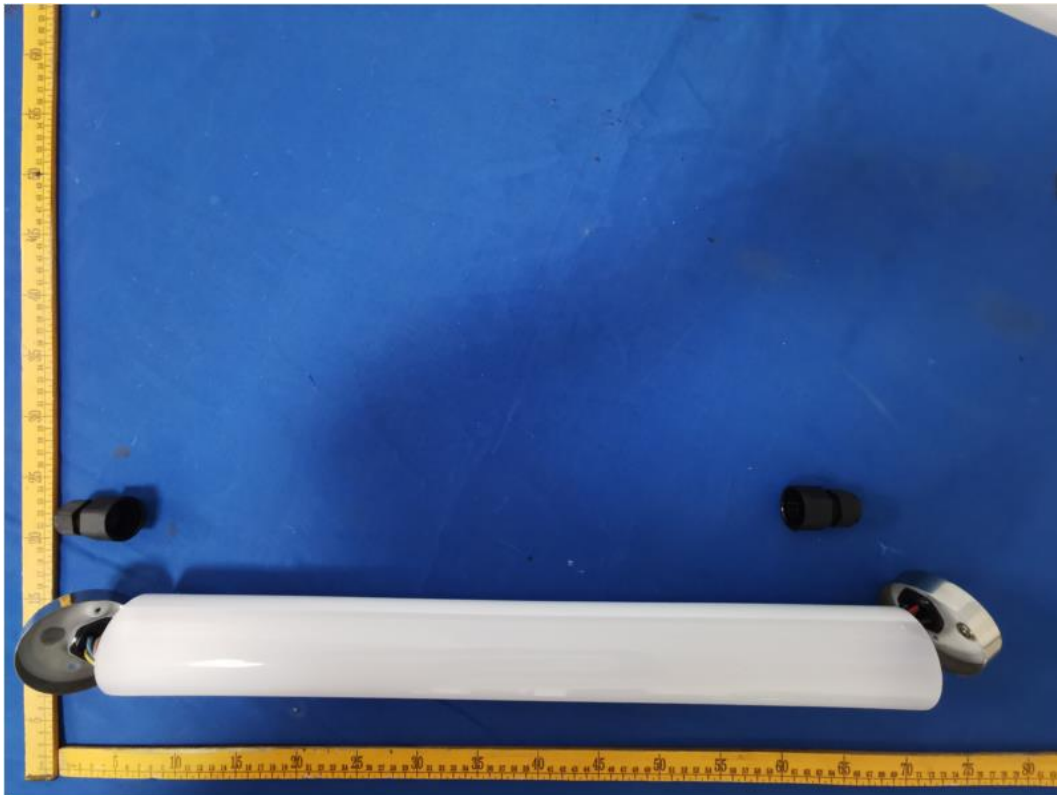


Fig. 6: Exploded view for model Dura69.60CM.1-10V.21W.NW

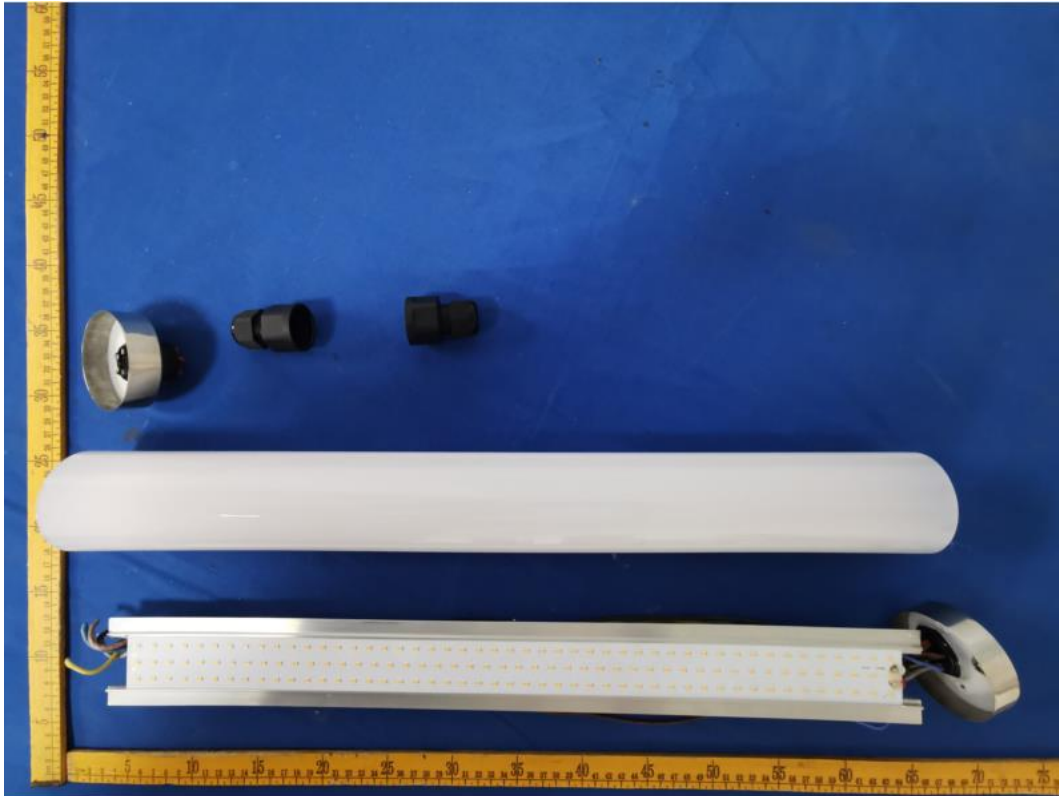


Fig. 7: Exploded view for model Dura69.60CM.1-10V.21W.NW

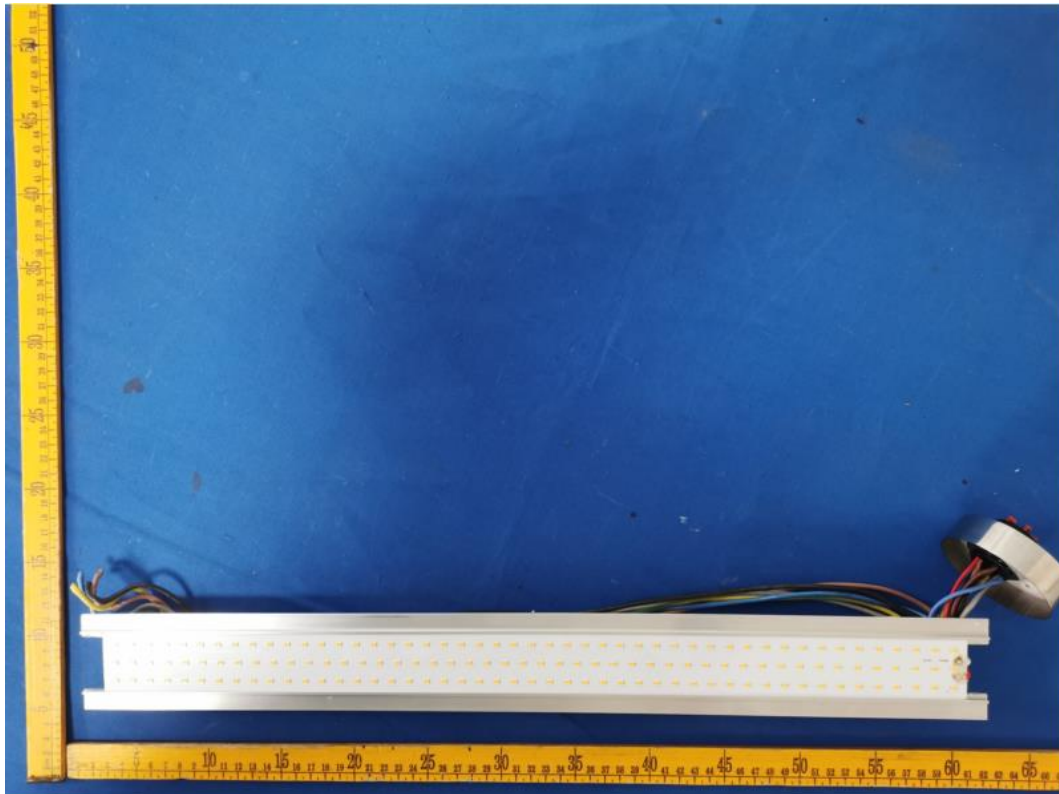


Fig. 8: Exploded view for model Dura69.60CM.1-10V.21W.NW

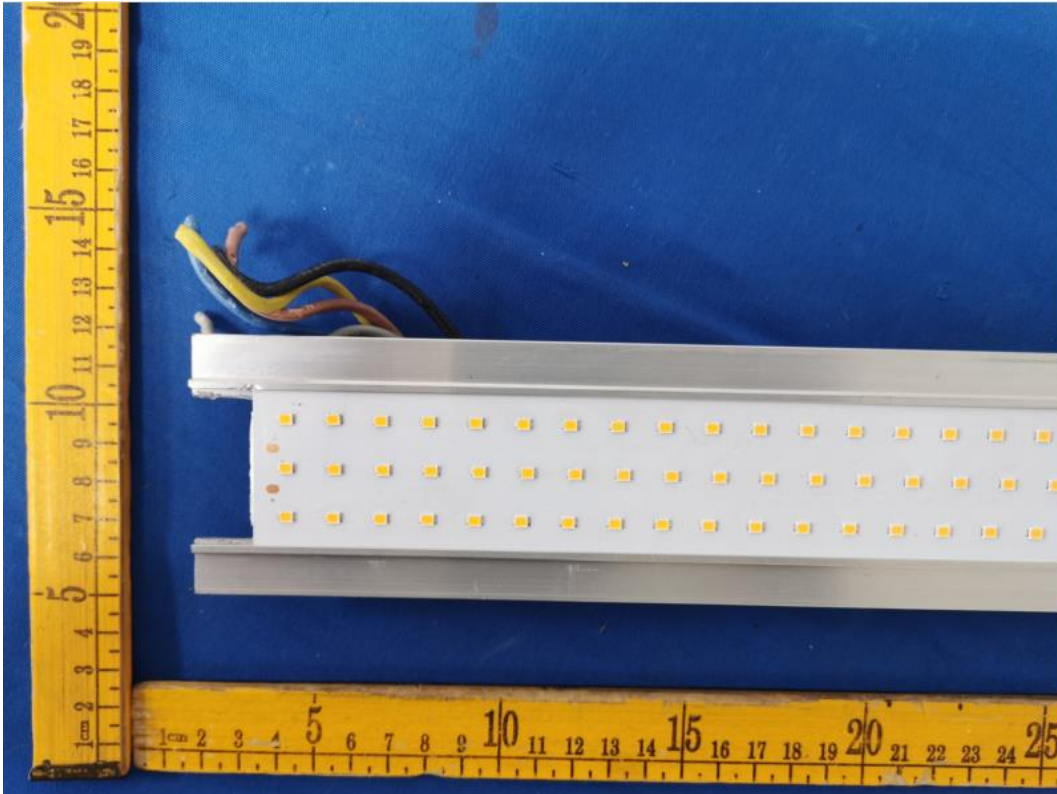


Fig. 9: LED module Dura69.60CM.1-10V.21W.NW

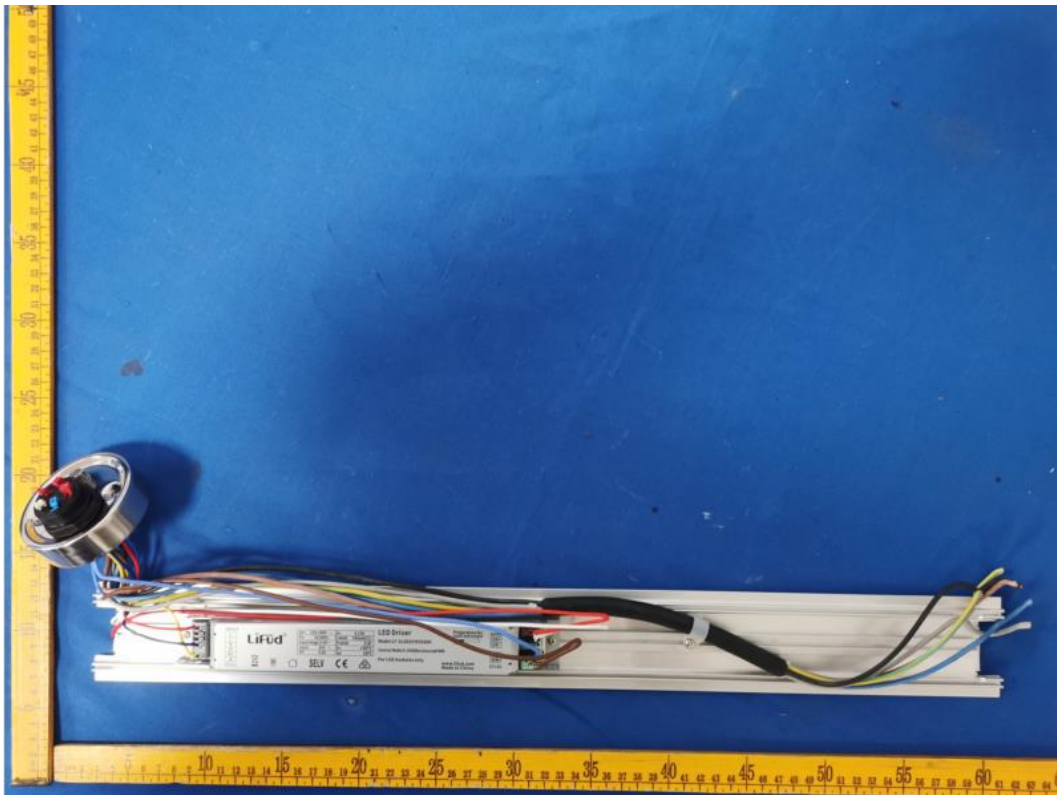


Fig. 10: Exploded view for model Dura69.60CM.1-10V.21W.NW

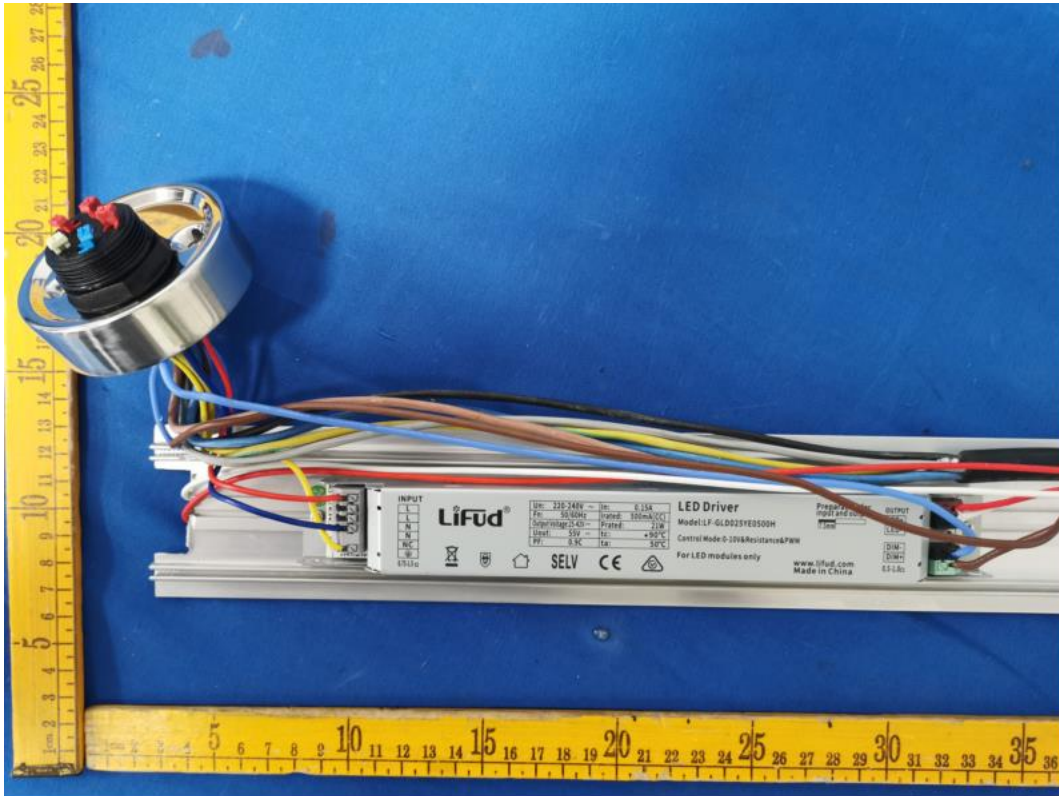


Fig. 11: Exploded view for model Dura69.60CM.1-10V.21W.NW



Fig. 12: Exploded view LED driver for model Dura69.60CM.1-10V.21W.NW

===== End Report =====