Test Report issued under the responsibility of:

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

Report Number. ..... :	SAFEONOKT240301
Date of issue ..... :	2024-02-19
Total number of pages ..... :	48 (including attachments)
Name of Testing Laboratory preparing the Report ..... :	IMQ IBÉRICA, S.L.U. C/ Sèquia de Benàger, 23. Pol. Ind. Alquería de Moret 46210 Picanya (Valencia) - Spain
Applicant's name ..... :	ONOK LAB, S.L.
Address ..... :	C/ Proyecto Oeste Pol. Ind. B, Parcela 3 46800-Xativa (Valencia) - Spain
Test specification:	
Standard ..... :	IEC 60598-2-1:2020 used in conjunction with IEC 60598-1:2020
Test procedure ..... :	CE SAFE
Non-standard test method ..... :	N/A
TRF template used ..... :	IECEE OD-2020-F1:2021, Ed.1.4
Test Report Form No. ..... :	IEC60598_2_1I
Test Report Form(s) Originator .... :	Intertek Semko AB
Master TRF ..... :	Dated 2022-08-26

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

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing Testing Laboratory.

The tests marked with * are not covered by the accreditation of ENAC

ENSAYO
ISO 17025
Nº1076 / LE2135

Test item description ..... :	Fixed luminaire
Trade Mark(s) ..... :	onok lighting
Manufacturer ..... :	ONOK LAB, S.L.
Model/Type reference ..... :	HOOP 90 / HPHIA90N39SBS (Sample ID: EBP_SAFEONOKT240301)
Ratings ..... :	220-240V. 50/60Hz. Class II. LED. 35W. IP20.

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

☒ **Testing Laboratory:**	**IMQ IBÉRICA, S.L.U.**	
Testing location/ address.....:	C/ Sèquia de Benàger, 23. Pol. Ind. Alquería de Moret 46210 Picanya (Valencia) - Spain	
Tested by (name, function, signature).....:	**Daniel Pastor** [Laboratory Technician]	
Approved by (name, function, signature)...:	**David Latorre** [Technical Responsible]	

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

Attachment No. 1 : Photo document, total 4 pages.
Attachment No. 2: European Group Differences and National Differences of EN 60598-1 and EN 60598-2-1, total 2 pages.
Attachment No. 3: LED modules for general lighting – Safety specification IEC 62031 and EN IEC 62031, total 5 pages.
Attachment No. 4: European Group Differences and National Differences of IEC 62031 and EN IEC 62031 + A11, total 1 page.

Summary of testing:

This Test Report covers the evaluation on references: HPHIA90N39SBS.

Following technical evaluation all tests have been carried out on models:

- HPHIA90N39SBS.

Tests performed (name of test and test clause):	**Testing location:**
Test Report No. SAFEONOKT240301 §1.4 (0)- General test requirements §1.5 (2)- Classification of luminaires §1.6 (3)- Marking §1.7 (4)- Construction §1.8 (11)- Creepage distances and clearances §1.10 (15)- Screwless terminals and electrical connections §1.11 (5)- External and internal wiring §1.12 (8)- Protection against electric shock §1.13 (12)- Endurance test and thermal test §1.14 (9)- Resistance to dust and moisture §1.16 (10)- Insulation resistance and electric strength §1.16 (13)- Resistance to heat, fire and tracking	IMQ IBÉRICA, S.L.U. C/ Sèquia de Benàger, 23 Pol. Ind. Alquería de Moret 46210 Picanya (Valencia) – Spain

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

EU

☒ **The product fulfils the requirements of:**

-EN IEC 60598-2-1:2021 used in conjunction with EN IEC 60598-1:2021 + A11:2022
-EN IEC 62031:2020 + A11:2021

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:
The *accuracy method* (decision rule) defined in IEC GUIDE 115 "Application of uncertainty of measurement to conformity assessment activities in the electrotechnical sector" is applied for tests related with the scope of the mentioned document. In any other case the binary statement for simple acceptance (or reject) rule is applied (w=0). In this case, the risk of false acceptance (or false reject) is up to 50%.
Uncertainties of measurements are calculated and available to the client. Uncertainties of tests out of the scope of the IEC GUIDE 115, if any, are indicated in the test report.

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.

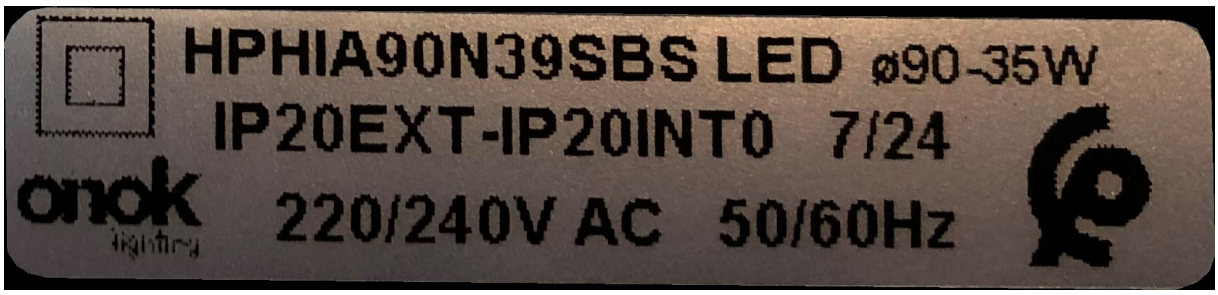
Uncertainties of measurements are calculated and available to the customer.

Statement of conformity
The statement of compliance with specification (or requirements) is based on a 95% coverage probability for the expanded uncertainty of the measurements results on which the decision of compliance is based.
The statement of compliance relates only to the test sample as tested and no to the simples/items which the test sample was drawn.
This Test Report is the result of testing a sample of the product submitted, in accordance with the provisions of the specified Technical Specification(s)/Standard(s). It does not imply any judgment on the production and it does not permit the use of a mark of conformity.

Copy of marking plate:

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

Reference: HPHIA90N39SBS



Location: Luminaire

Test item particulars.....:	Fixed general purpose luminaire
Classification of installation and use.....:	Suitable for direct mounting on normally flammable surfaces, indoor use.
Supply Connection.....:	Terminal Block
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing.....:	
Date of receipt of test item .....:	2024-01-14
Date (s) of performance of tests.....:	2024-01-29 / 2024-02-28

General remarks:

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

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

The ability or reliability of this product to perform its intended function in a particular application has not been investigated.

Unless otherwise specified, warnings, installation instructions and/or user manual provided with the sample have been checked in Spanish or English version only.

Testing laboratory accepts no responsibility for the information provided by the applicant.

☒ CTL/OSM decision reported on the relevant website at the time of issuing the TR have been taken into account.

General product information and other remarks:

1. Maximum CCT **3000K**.
2. LED component according EN 62471 classification risk group: ☐ RG0 ☒ RG1 ☐ RG2 ☐ RG3
   (The EN 62471 information is based in the test report NºRDG180425050-03).

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.4 (0)	**GENERAL TEST REQUIREMENTS**		**P**
1.4 (0.3)	More sections applicable..... :	Yes ☐ No ☒ Section/s:	—
1.4 (0.5)	Components	(see Annex 1)	—
1.4 (0.7)	**Information for luminaire design in light sources standards**		—
1.4 (0.7.2)	Light source safety standard ..... :	IEC/EN 62031	—
	Luminaire design in the light source safety standard		P
1.5 (2)	**CLASSIFICATION OF LUMINAIRES**		**P**
1.5 (2.2)	Type of protection ..... :	Class II	P
1.5 (2.3)	Degree of protection..... :	IP20	—
1.5 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces ..... :	Yes ☒ No ☐	—
1.5 (2.5)	Luminaire for normal use ..... :	Yes ☒ No ☐	—
	Luminaire for rough service ..... :	Yes ☐ No ☒	—
1.6 (3)	**MARKING**		**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	Spanish/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	Indoor use	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

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
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		N/A
1.6 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A
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		N/A
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		N/A
1.6 (3.3.25)	Luminaires employing light sources emitting UV on mains wiring, information provided		N/A
1.6 (3.3.26)	Wall mounted luminaire using external flexible cable or cord longer than 0.3 m, information provided		N/A
1.6 (3.4)	Test with water	15s	P
	Test with hexane	15s	P
	Legible after test		P
	Label attached		P
1.7 (4)	**CONSTRUCTION**		**P**
1.7 (4.2)	Components replaceable without difficulty		P
1.7 (4.3)	Wireways smooth and free from sharp edges		P
1.7 (4.4)	**Lamp holders**		**N/A**
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

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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
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
1.7 (4.5)	**Starter holders**		**N/A**
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
1.7 (4.6)	**Terminal blocks**		**N/A**
	Tails		N/A
	Unsecured blocks		N/A
1.7 (4.7)	**Terminals and supply connections**		**P**
1.7 (4.7.1)	Contact to metal parts		P
1.7 (4.7.2)	Test 8 mm live conductor		P
	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		N/A
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
1.7 (4.8)	**Switches**		**N/A**
	- adequate rating		N/A
	- adequate fixing		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- polarized supply		N/A
	- compliance with IEC 61058-1 for electronic switches		N/A
1.7 (4.9)	**Insulating lining and sleeves**		**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
	a) & c) Insulation resistance and electric strength		N/A
	b) Ageing test. Temperature (°C) ..... :	--	N/A
1.7 (4.10)	**Double or reinforced insulation**		**P**
1.7 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		P
	Safe installation fixed luminaires		P
	Capacitors and switches		N/A
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)	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
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
1.7 (4.11)	**Electrical connections and current-carrying parts**		**P**
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

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7 (4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- 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
1.7 (4.12)	**Screws and connections (mechanical) and glands**		**P**
1.7 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N/A
	Torque test: torque (Nm); part..... :	1,2; Enclosure (Convertor)	P
1.7 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
1.7 (4.12.4)	Locked connections:		N/A
	- 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)..... :	--	N/A
1.7 (4.13)	**Mechanical strength**		**P**
1.7 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm) ..... :	0,2; Diffuser	P
	- other parts; energy (Nm)..... :	0,35; Enclosure	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	30N	P
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

* The tests marked with * are not enshrined by ENAC accreditation.

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7 (4.14)	**Suspensions, fixings and means of adjusting**		**P**
1.7 (4.14.1)	Mechanical load:		P
	A) four times the weight	4,8 Kg = 1,2Kg x 4	P
	B) torque 2,5 Nm		N/A
	C) bracket arm; bending moment (Nm) ..... :	--	N/A
	D) load track-mounted luminaires		N/A
	E) clip-mounted luminaires, glass-shelve. Thickness (mm) ..... :	--	N/A
	Metal rod. diameter (mm) ..... :	--	N/A
	Fixed luminaire or independent control gear without fixing devices		N/A
1.7 (4.14.2)	Load to flexible cables		P
	Mass (kg) ..... :	0,4kg (one conductor)	—
	Stress in conductors (N/mm²) ..... :	3,92 N/mm²	P
	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
1.7 (4.15)	**Flammable materials**		**P**
	- glow-wire test 650°C ..... :	See Test Table 1.15 (13.3.2)	P
	- spacing ≥30 mm		N/A
	- screen withstanding test of 13.3.1		N/A
	- screen dimensions		N/A
	- no fiercely burning material		P
	- thermal protection		N/A
	- electronic circuits exempted		N/A
1.7 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		N/A
	a) construction		N/A
	b) temperature sensing control		N/A

* The tests marked with * are not enshrined by ENAC accreditation.

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	c) surface temperature		N/A
1.7 (4.16)	**Luminaires for mounting on normally flammable surfaces**		**P**
	No lamp control gear ..... :	(compliance with Section 12)	N/A
	Provided with adaptor for a track meet the requirements for direct mounting on normally flammable surfaces		N/A
1.7 (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
	- 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
1.7 (4.17)	**Drain holes**		**N/A**
	Clearance at least 5 mm		N/A
1.7 (4.18)	**Resistance to corrosion**		**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		N/A
1.7 (4.19)	Ignitors compatible with ballast		N/A
1.7 (4.20)*	Rough service vibration		N/A
1.7 (4.21)	**Protective shield**		**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
1.7 (4.24)	**Photobiological hazards**		**P**

* The tests marked with * are not enshrined by ENAC accreditation.

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
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
1.7 (4.25)	**Mechanical hazard**		**P**
	No sharp point or edges		P
1.7 (4.26)	**Short-circuit protection**		**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
1.7 (4.27)	**Terminal blocks with integrated screwless protective earthing contacts**		**N/A**
	Test according Annex V		N/A
	Pull test of terminal fixing (20 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Pull test of mechanical connection (50 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Voltage drop test, resistance < 0,05 Ω		N/A
1.7 (4.28)	**Fixing of thermal sensing control**		**N/A**
	Not plug-in or easily replaceable type		N/A
	Reliably kept in position		N/A
	No adhesive fixing if UV radiations from a lamp can degrade the fixing		N/A
	Not outside the luminaire enclosure		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Test of adhesive fixing:		N/A
	Max. temperature on adhesive material (°C) ..... :	--	—
	100 cycles between t min and t max		N/A
	Temperature sensing control still in position		N/A
1.7 (4.29)	**Luminaires with non-replaceable light source**		**N/A**
	Not possible to replace light source		N/A
	Live part not accessible after parts have been opened by hand or tools		N/A
1.7 (4.30)	**Luminaires with non-user replaceable light source**		**P**
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		N/A
	At least one fixing means requiring use of tool		P
1.7 (4.31)	**Insulation between circuits**		**P**
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3	IEC 61347-1	P
	Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfil requirements according 4.31.1 – 4.31.3		N/A
1.7 (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		N/A
	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

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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 have protective conductor contact		N/A
1.7 (4.31.3)	Other circuits		P
	Other circuits insulated from accessible parts according Table X.1		P
	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
1.7 (4.32)	**Overvoltage protective devices**		**N/A**
	Comply with IEC 61643-11		N/A
	External to controlgear and connected to earth:		N/A
	- only in fixed luminaires		N/A
	- only connected to protective earth		N/A
1.7 (4.33)	**Luminaire powered via information technology communication cabling**		**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
1.7 (4.34)	**Electromagnetic fields (EMF)**		**P**
	No harmful electromagnetic fields	According to IEC 62493:2015 clause 4.2.2 EUT is deemed to pass without testing	P
1.7 (4.35)	**Protection against moving fan blades**		**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 ≥ 0.5 mm and:		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	-hardness less than D60 Shore		N/A
	-peripheral speed less than 15 m/s		N/A
	-input power of fan ≤ 2 W at rated voltage		N/A
1.7 (4.36)	**Track-mounted luminaires**		N/A
	Test in accordance with Annex A of IEC60570:2003/AMD2:2019		N/A

1.8 (11)	**CREEPAGE DISTANCES AND CLEARANCES**		**P**
1.8 (11.2.1)	Impulse withstand category (Normal category II)	Category II ☒ Category III ☐	—
	Category III according Annex U		N/A
	Protected against pollution, reduced creepage and clearance according Annex P of IEC 61347-1		N/A
1.8 (11.2.2)	Creepage distances for frequency up to 30 kHz	See Test Table 1.8 (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 1.8 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 1.8 (11.2) II	N/A
1.8 (11.2.3)	Clearances for frequency up to 30 kHz	See Test Table 1.8 (11.2) I	P
	Clearances distances for frequency over 30 kHz:		N/A
	- Controlgear marked with U_P	See Test Table 1.8 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 1.8 (11.2) II	N/A

1.9 (7)	**PROVISION FOR EARTHING**		**N/A**
1.9 (7.2.1 + 7.2.3)	Accessible metal parts		N/A
	Metal parts in contact with supporting surface		N/A
	Resistance < 0,5 Ω..... :	--	N/A
	Self-tapping screws used		N/A
	Thread-forming screws		N/A
	Thread-forming screw used in a grove		N/A
	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

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
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		N/A
1.9 (7.2.7)	Electrolytic corrosion of the protective earth terminal		N/A
1.9 (7.2.8)	Material of protective earth terminal		N/A
	Contact surface bare metal		N/A
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		N/A
	Length of protective earthing conductor		N/A
1.9 (7.2.12)	PELV circuit connected to protective earth for functional purpose		N/A
1.10 (14)	**SCREW TERMINALS**		**N/A**
	Separately approved; component list	(see Annex 1)	N/A
	Part of the luminaire	(see Annex 3)	N/A
1.10 (15)	**SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS**		**P**
	Separately approved; component list..... :	(see Annex 1)	P
	Part of the luminaire ..... :	(see Annex 4)	N/A
1.11 (5)	**EXTERNAL AND INTERNAL WIRING**		**P**
1.11 (5.2)	**Supply connection and external wiring**		**P**
1.11 (5.2.1)	Means of connection ..... :	Terminal Block	P
	Outdoor luminaire has not PVC insulated external wiring if not Class III or SELV/PELV circuits ≤ 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 ..... :	--	N/A
	Nominal cross-sectional area (mm²) ..... :	--	N/A
	Cables equal to IEC 60227 or IEC 60245		N/A
1.11 (5.2.3)	Type of attachment, X, Y or Z		N/A
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

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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
	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	Type Y	P
1.11 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N) ..... :	60	P
	- torque test: torque (Nm)..... :	0,15	P
	- displacement ≤ 2 mm		P
	- no movement of conductors		P
	- no damage of cable or cord		P

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- function independent of electrical connection		P
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 ≤ 25V RMS/60V DC		N/A
	- Ordinary Class III luminaire supplied with PELV ≤12V RMS/30V DC		N/A
	- Other than ordinary Class III luminaire supplied with voltage ≤12V 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		N/A
1.11 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A
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		N/A
	- IEC 60083		N/A
	- other standard		N/A
1.11 (5.3)	**Internal wiring**		**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

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- temperatures ..... :	(see Annex 2)	N/A
	Green-yellow for protective earth only		N/A
1.11 (5.3.1.1)	Internal wiring connected directly to fixed wiring		N/A
	Cross-sectional area (mm²)..... :	--	N/A
	Insulation thickness (mm) ..... :	--	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 (mm²)..... :	2x0,5mm²	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.		N/A
	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
1.11 (5.4)	**Test to determine suitability of conductors having a reduced cross-sectional area**		**N/A**
	Under test the temperature of the luminaire wiring insulation not exceed the limits stated in Table 12.2	(see Annex 2)	N/A
	No damage to luminaire wiring after test		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.12 (8)	**PROTECTION AGAINST ELECTRIC SHOCK**		**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		N/A
	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		N/A
	Double-ended tungsten filament lamp		N/A
	Insulation lacquer not reliable		N/A
	Double-ended high-pressure discharge lamp		N/A
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
1.12 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
1.12 (8.2.3.a)	Class II luminaire:		P
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A
	- required insulation from live parts in compliance with Table X.1		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
	- touch current if applicable (mA) ..... :	--	N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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/PELV		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 μF not exceed 50 V 1 min after disconnection		N/A
	Portable luminaire with capacitor > 0,1 μF (0.25) not exceed 34 V 1 s after disconnection		N/A
	Other luminaires with capacitor > 0,1 μF (0.25) with plug and track adaptors not exceed 60 V 5 s after disconnection		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.13 (12)	**ENDURANCE TEST AND THERMAL TEST**		**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		—
1.13 (12.2)	**Selection of lamps and ballasts**		**—**
	Lamp used according Annex B	(Lamp used see Annex 2)	—
	Control gear if separate and not supplied	(Control gear used see Annex 2)	—
1.13 (12.3)	**Endurance test**		**P**
	a) mounting-position ..... :	(according Instructions)	—
	b) test temperature (°C) ..... :	35ºC = 25ºC + 10ºC	—
	c) total duration (h) ..... :	240h	—
	d) supply voltage (V) ..... :	264V = 240V x 1,10	—
	d) if not equipped with control gear, constant voltage/current (V) or (A) ..... :	--	—
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	Luminaire works	—
	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)	**Thermal test (normal operation)**	(see Annex 2)	**P**
1.13 (12.5)	**Thermal test (abnormal operation)**	(see Annex 2)	**N/A**
1.13 (12.6)	**Thermal test (failed lamp control gear condition):**		**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

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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)	**Thermal test (failed lamp control gear in plastic luminaires):**		**N/A**
1.13 (12.7.1)	Luminaire without temperature sensing control		N/A
1.13 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N/A
	Test method 12.7.1.1 or Annex W ..... :	--	—
	Test according to 12.7.1.1:		N/A
	- case of abnormal conditions ..... :	--	—
	- Ballast failure at supply voltage (V) ..... :	--	—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
	Test according to Annex W:		N/A
	- case of abnormal conditions ..... :	--	—
	- measured winding temperature (°C): at 1,1 Un ..... :	--	—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un ..... :	--	—
	- calculated temperature of fixing point/exposed part (°C) ..... :	--	—
	Ball-pressure test .....:	See Test Table 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 (°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 1.15 (13.2.1)	N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.13 (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
1.13 (12.7.2)	Luminaire with temperature sensing control		N/A
	- thermal link..... :	Yes ☐ No ☐	—
	- manual reset cut-out ..... :	Yes ☐ No ☐	—
	- auto reset cut-out ..... :	Yes ☐ No ☐	—
	- case of abnormal conditions ..... :	--	—
	- highest measured temperature of fixing point/ exposed part (°C): ..... :	--	—
	Ball-pressure test: ..... :	See Test Table 1.15 (13.2.1)	N/A

1.14 (9)	**RESISTANCE TO DUST AND MOISTURE**		**P**
1.14 (-)	If IP > IP 20 the order of tests as specified in clause 1.12		P
1.14 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP..... :	IP20	—
	- mounting position during test..... :	(according Instructions)	—
	- fixing screws tightened; torque (Nm) ..... :	2/3 torque	—
	- tests according to clauses..... :	9.2.0	—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N/A
	b) no talcum in dust-tight luminaire		N/A
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		N/A
	c.1) For luminaires without drain holes – no water entry		N/A
	c.2) For luminaires with drain holes – no hazardous water entry		N/A
	d) no water in watertight, 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)		P
	e) no entry into enclosure (IP 3X and IP 4X)		N/A
	e) no contact with live parts through drain holes and ventilation slots (IP3X and IP4X)		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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	25ºC / 93% RH	P

1.15 (10)	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		**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):		—
	SELV/PELV:		P
	- between current-carrying parts of different polarity :		N/A
	- between current-carrying parts and mounting surface..... :	>1,3MΩ	P
	- between current-carrying parts and metal parts of the luminaire..... :	>1,3MΩ	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:		P
	- between live parts of different polarity ..... :	--	N/A
	- between live parts and mounting surface ..... :	>2,6MΩ	P
	- between live parts and metal parts ..... :	>2,6MΩ	P
	- between live parts of different polarity through action of a switch..... :	--	N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :	--	N/A
	- Insulation bushings as described in Section 5 ..... :	--	N/A
1.15 (10.2.2)	Electric strength test		P
	Dummy lamp		N/A
	Luminaires with ignitors after 24 h test		N/A
	Luminaires with manual ignitors		N/A
	Test voltage (V):		N/A
	SELV/PELV:		P
	- between current-carrying parts of different polarity :		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- between current-carrying parts and mounting surface..... :	500V	P
	- between current-carrying parts and metal parts of the luminaire..... :	500V	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :	--	N/A
	- Insulation bushings as described in Section 5 ..... :	--	N/A
	Other than SELV/PELV:		P
	- between live parts of different polarity ..... :	--	N/A
	- between live parts and mounting surface ..... :	2960V	P
	- between live parts and metal parts ..... :	2960V	P
	- between live parts of different polarity through action of a switch..... :	--	N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :	--	N/A
	- Insulation bushings as described in Section 5 ..... :	--	N/A
1.15 (10.3)	Touch current (mA)……:	0,02	P

1.16 (13)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		**P**
1.16 (13.2.1)	Ball-pressure test .....:	See Test Table 1.16 (13.2.1)	N/A
1.16 (13.3.1)	Needle-flame test (10 s).....:	See Test Table 1.16 (13.3.1)	N/A
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

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

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	N/A	--	11.1B	N/A	--	11.1A	
Working voltage (V) ..... :					Max. 24V DC			—
PTI ..... :					< 600 ☒ ≥ 600 ☐			—
Pulse voltage or U_P if applicable (kV) ..... :					N/A			—
Supplementary information: Between LED (PCB) and conductive accesible parts. No hazard live part according to Annex A.According to Annex X.								
Distance 2:	B	N/A	--	11.1B	N/A	--	11.1A	
Working voltage (V) ..... :					Max. 24V DC			—
PTI ..... :					< 600 ☒ ≥ 600 ☐			—
Pulse voltage or U_P if applicable (kV) ..... :					N/A			—
Supplementary information: Between (Terminal block) and conductive live parts. No hazard live part according to Annex A.According to Annex X.								
Distance 3:	R	24,1	3	11.1.B	27,8	5	11.1.A	
Working voltage (V) ..... :					Max. 240V AC			—
PTI ..... :					< 600 ☒ ≥ 600 ☐			—
Pulse voltage or U_P if applicable (kV) ..... :					N/A			—
Supplementary information: Between live parts (Terminal block) and conductive parts.								

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

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

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 ☐ ≥ 600 ☐		—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) .....:					--		—
Supplementary information:							
Distance 2:	--	--	--	--	--	--	--
Working voltage (V) .....:					--		—
Frequency if applicable (kHz) .....:					--		—
PTI .....:					< 600 ☐ ≥ 600 ☐		—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) .....:					--		—
Supplementary information:							
Distance 3:	--	--	--	--	--	--	--
Working voltage (V) .....:					--		—
Frequency if applicable (kHz) .....:					--		—
PTI .....:					< 600 ☐ ≥ 600 ☐		—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) .....:					--		—
Supplementary information:							

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

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

1.16 (13.2.1)	**TABLE: Ball Pressure Test of Thermoplastics**			**N/A**
Allowed impression diameter (mm) ..... :		2		—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
--	--	--	--	
Supplementary information:				

1.16 (13.3.1)	**TABLE: Needle-flame test**				**N/A**
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
--	--	--	--	--	--
Supplementary information:					

1.16 (13.3.2)	**TABLE: Resistance to heat and fire - Glow wire tests**				**P**
Object/ Part No./ Material	**Manufacturer/ trademark**	**GWT (°C) : 650**			**Verdict**
		t_E (s)	**t_I (s)**	**t_R (s)**	
Diffuser	--	No ignition	--	--	P
Ignition of the specified layer placed underneath the test specimen (Yes/No)..... :					No
Supplementary information:					

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

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

ANNEX 1	**TABLE: Critical components information[2]**					**P**
Object / part No.	**Code**	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
LED	C	DongGuan Guangmu Optoelectronics Co., LTD.	T2835	3V DC. 0,06A. 0,2W. 3000K. RG1.	EN 62471	-
PCB	C	Shenzhen Hongqi Lighting Accessories Co., LTD.	HQ-D	V-0.	EN 60598-1	Tested with apliance
Convertor	B	KGP Electronics GmBH	FV60W24CG	220-240V AC. 50/60Hz. 0,38A. Pmax: 60W. SELV.	EN 61347-1 EN 61347-2-13	TÜV
Connector	B	Shenzhen Qijie Electronic Co., Ltd.	Hippo-M	5A. IP20.	EN 60998-2-2	CE
Wire	A	Cables RCT	H03VV-F	300/300V. 2x 0,5 mm².	EN 50525-2-11	AENOR

Supplementary information:

1) Provided evidence ensures the agreed level of compliance.

2) This information has been provided by the applicant

The codes above have the following meaning:

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

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

C - Integrated component tested together with the appliance

D - Alternative component

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

ANNEX 2	**TABLE: Thermal tests of Section 12**		**P**
	Type reference ..... :	HPHIA90N39SBS	—
	Lamp used..... :	(see Annex 1)	—
	Lamp control gear used ..... :	(see Annex 1)	—
	Mounting position of luminaire ..... :	(according Instructions)	—
	Supply wattage (W) ..... :	35,1	—
	Supply current (A) ..... :	0,1	—
	Temperatures in test 1 - 4 below are corrected for ta (°C) ..... :	25ºC	—
	- abnormal operating mode ..... :	N/A	—
1.13 (12.4)	- test 1: rated voltage ..... :	240V = 240V x 1,00	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current ..... :	254,4V = 240V x 1,06	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :	N/A	—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :	N/A	—
1.13 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current or 130/150% of rated input voltage ..... :	N/A	—

Temperature measurements (°C)

Part	Ambient	**Cl. 12.4 – normal**				**Cl. 12.5 – abnormal**	
		test 1	test 2	test 3	limit	test 4	limit
LED Module (tc)	25,0	44,3	-	-	60	-	-
Convertor (tc)	25,0	40,2	-	-	90	-	-
LED Module Wire	25,0	-	44,3	-	70	-	-
Connector	25,0	-	37,2	-	105	-	-
Diffuser	25,0	-	33,7	-	130	-	-
Wire cord (STRESSED)	25,0	-	28,4	-	90	-	-
Mounting surface	25,0	-	30,6	-	90	-	-
Supplementary information:							

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

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

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

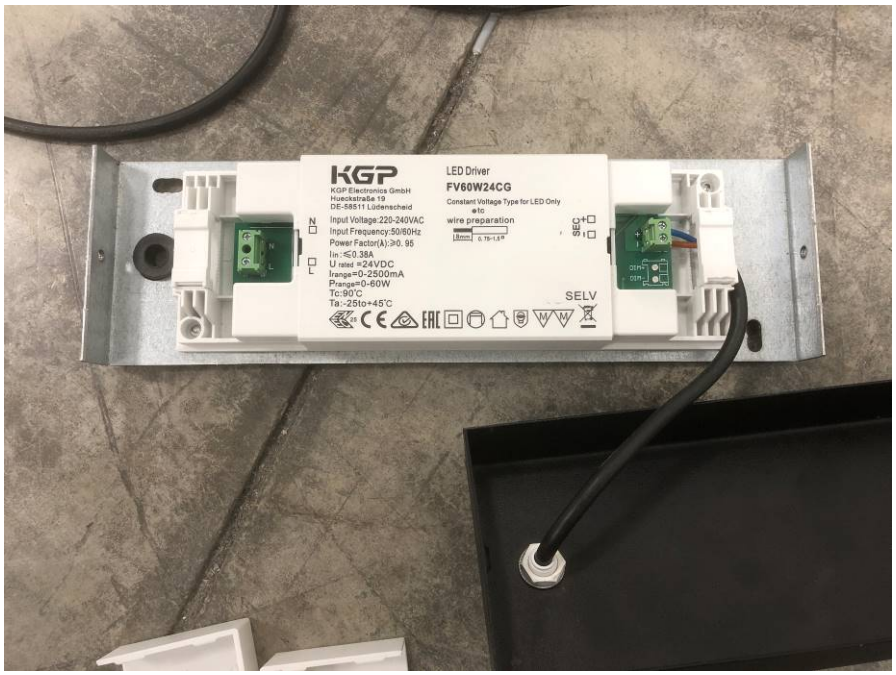
ANNEX 4	**Screwless terminals (part of the luminaire)**		**N/A**
(15)	**SCREWLESS TERMINALS**		**N/A**
(15.2)	Type of terminal.....:	--	—
	Rated current (A).....:	--	—
(15.3.1)	Material		N/A
(15.3.2)	Clamping		N/A
(15.3.3)	Stop		N/A
(15.3.4)	Unprepared conductors		N/A
(15.3.5)	Pressure on insulating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

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....:	--	N/A
(15.6.2.2)	Pull test pin or tab terminals (4 samples); pull (N) .....:	--	N/A
(15.6.3)	Electrical tests		N/A
	Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1		N/A

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

Attachment No. 1	Photo document	—


KGP
KGP Electronics GmbH
Hueckstraße 19
DE-58511 Lüdenscheid
LED Driver
FV60W24CG
Constant Voltage Type for LED Only
etc
wire preparation
8mm
0.75-1.5
Input Voltage:220-240VAC
Input Frequency:50/60Hz
Power Factor(λ):≥0. 95
Iin:≤0.38A
U rated =24VDC
Irange=0-2500mA
Prange=0-60W
Tc:90℃
Ta:-25to+45℃
SELV


KGP
KGP Electronics GmbH
Hueckstraße 19
DE-58511 Lüdenscheid
LED Driver
FV60W24CG
Constant Voltage Type for LED Only
etc
wire preparation
Input Voltage:220-240VAC
Input Frequency:50/60Hz
Power Factor(λ):≥0. 95
Iin:≤0.38A
U rated =24VDC
Irange=0-2500mA
Prange=0-60W
Tc:90℃
Ta:-25to+45℃
SELV


eled
+24VDC
VEC28-12/830

IEC60598_2_1I ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
ATTACHMENT TO TEST REPORT **IEC 60598-2-1** **EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES** Luminaires Part 2: Particular requirements Section 1: Fixed general purpose luminaires			
Differences according to.....:	EN IEC 60598-2-1:2021 used in conjunction with EN IEC 60598-1:2021 + AMD11:2022		
TRF template used .....:	IECEE OD-2020-F2:2020, Ed. 1.1		
Attachment Form No.....:	EU_GD_IEC60598_2_1I		
Attachment Originator .....:	UL(Demko)		
Master Attachment.....:	2022-05-13		
	CENELEC COMMON MODIFICATIONS (EN)		—
1.6 (3)	**MARKING**		**P**
1.6 (3.2.12)	Note 4 deleted		P
1.7 (4)	**CONSTRUCTION**		**N/A**
1.7 (4.11.6)	Electro-mechanical contact systems: electric strength test at 1 500 V		N/A
1.11 (5)	**EXTERNAL AND INTERNAL WIRING"**		**P**
1.11 (5.2.2)	Cables equal to EN 50525 (all parts)		P
	Paragraph 2 deleted		N/A
	Replace table 5.1 – Supply cord		N/A
1.13 (12)	**ENDURANCE TESTS AND THERMAL TESTS**		**P**
1.13 (12.4.2c)	Thermal test (normal operation) see footnote c to table 12.2 relating to unsleeved fixed wiring		P
ZB	**ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)**		**N/A**
(3.3)	DK: power supply cords of class I luminaires with label		N/A
(5.2.1)	CY, DK, FI, UK: type of plug		N/A
(5.2.18)	DK: socket-outlets		N/A
ZC	**ANNEX ZC, NATIONAL DEVIATIONS (EN)**		**N/A**
(4 & 5)	FR: Shuttered socket-outlets 10/16A		N/A

IEC60598_2_1I ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	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
	UK: Requirements according to United Kingdom Building Regulation		N/A

Attachment No. 4	**LED modules for general lighting – Safety specifications** **Test according to IEC 62031:2018 (Second edition) & EN IEC 62031:2020.** **(clauses number between brackets refer to clause in IEC 61347-1)**	—

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

6	**MARKING**		—
6.5	**Marking of integral LED modules**		**P**
	- information in 6.2 a) to g) in data sheet, leaflet or website		P

7	**TERMINALS**	—
	Evaluated in final product	P

8 (9)	**EARTHING**	—
	Evaluated in final product	N/A

10 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		—
- (10.1)	Controlgear protected against accidental contact with live parts	Integral LED module protected against accidental contact with the luminaire's enclosure. SELV.	P
- (A2)	Voltage measured with 50 kΩ	(see Annex A)	P
- (A3)	Voltage > 35 V peak or > 60 V d.c. or protective impendance device	(see Annex A)	N/A

10 (11)	**MOISTURE RESISTANCE AND INSULATION**	—
	Evaluated in final product	P

11 (12)	**ELECTRICAL STRENGTH**		—
	Immediately after clause 11 electric strength test for 1 min	Refer to main report subclause 1.15 (10.2.2)	P
	Basic insulation for SELV, test voltage 500 V	Refer to main report subclause 1.15 (10.2.2)	P
	Working voltage ≤ 50 V, test voltage 500 V		N/A
	Working voltage > 50 V ≤ 1000 V, test voltage (V):		N/A
	Basic insulation, 2U + 1000 V		N/A
	Supplementary insulation, 2U + 1000 V		N/A
	Double or reinforced insulation, 4U + 2000 V		N/A
	No flashover or breakdown		P
	Solid or thin sheet insulation for double or reinforced insulation fulfil the requirements in Annex N in IEC 61347-1		N/A

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

- (14.7)	Relevant fault condition tests with high-power a.c. supply and in turn to a d.c. supply		—

12.2	**Overpower condition**		**P**
	Module withstands overpower condition >15 min.		P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		N/A
	No fire, smoke or flammable gas is produced		N/A
	Molten material does not ignite tissue paper, spread below the module		N/A

14 (15)	**CONSTRUCTION**		—
- (15.1)	**Wood, cotton, silk, paper and similar fibrous material**		**P**
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
- (15.2)	**Printed circuits**		**N/A**
	Printed circuits used as internal connections complies with clause 14		N/A

15 (16)	**CREEPAGE DISTANCES AND CLEARANCES**	—
	Evaluated in final product	P

16 (17)	**SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS**	—
	Screws, current-carrying parts and connections in compliance with IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1)	—
	Evaluated in final product	—

17 (18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		—
- (18.1)	Ball-pressure test ..... :	See Test Table 17 (18.1)	N/A

18	**RESISTANCE TO CORROSION**		—
	Comply with requirements according 4.18 of IEC 60598-1		P

20	**HEAT MANAGEMENT**		—
20.1	**General**		**N/A**
	Fulfil clause 20 if replaceable LED module and when heat conducting thermal interface is needed.		N/A
20.2	**Thermal interface material**		**N/A**

	Thermal interface material delivered with the module if necessary		N/A
20.3	**Heat protection**		**N/A**
	Not impair safety when operated under poor heat-conduction conditions according Annex D		N/A

22	**PHOTOBIOLOGICAL SAFETY**		—
22.1	**UV radiation**		**N/A**
	Luminous radiation not exceed 2mW/klm		N/A
22.2	**Blue light hazard**		**P**
	Assessed according to IEC TR 62778	RG1	P
22.3	**Infrared radiation**		**N/A**
	Requirements for infrared radiation when required		N/A

A	**ANNEX A - TESTS**		—
	All tests performed in accordance with the advice given in Annex H of IEC 61347-1, if applicable		N/A

12 (14)	**TABLE: tests of fault conditions**	—
Part	Simulated fault	Hazard
LED 4	Open-circuit	~~YES~~ / NO
LED 8	Short-circuit	~~YES~~ / NO

17 (18.1)	**TABLE: Ball Pressure Test of Thermoplastics**			**N/A**
Allowed impression diameter (mm) :		2		—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
--	--	--	--	
Supplementary information:				

(A)	**ANNEX A - TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS A LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK**		—
(A.1)	Comply with A.2 or A.3		P
(A.2)	Voltage ≤ 35 V peak or ≤ 60 Vd.c ..... :	1,2V	P
(A.3)	If voltage > 35 V peak or > 60 Vd.c. or protective impedance device; touch current does not exceed 0,7 mA (peak) or 2 mAd.c. ..... :	--	N/A
	Comply with annex G of IEC 60598-1		N/A

ANNEX 1	**LED MODULES WITH INTEGRAL CONTROLGEAR PROVIDING SELV**	—
	Evaluated in final product	N/A

IEC62031 - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
ATTACHMENT TO TEST REPORT **IEC 62031:2018** **EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES** (LED modules for general lighting - Safety specifications)			
Differences according to.....:	EN IEC 62031: 2020 + A11: 2021		
TRF template used .....:	IECEE OD-2020-F2:2022, Ed. 1.2		
Attachment Form No.....: **Attachment Originator .....**: **Master Attachment**.....:	EU_GD_IEC62031F UL Solutions (Demko) Dated 2022-09-30		
	CENELEC COMMON MODIFICATIONS (EN)		**—**
	No Common modifications		P
ZA	**ANNEX ZA, NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS**		**P**
ZZ	**ANNEX ZZ, RELATIONSHIP BETWEEN THIS EUROPEAN STANDARD AND THE SAFETY OBJECTIVES OF DIRECTIVE 2014/35/EU [2014 OJ L96] AIMED TO BE COVERED**		**N/A**