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检测
TESTING
CNAS L6478

TEST REPORT

Reference No.	:	WTF25F05114913L
Applicant	:	Mid Ocean Brands B.V.
Address	:	Unit 711-716, 7/F., Tower A, 83 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong.
Manufacturer	:	114901
Address	:	/
Product Name	:	Indoor garden 4 LED grow light
Model No.	:	MO2702
Test specification	:	Luminaires Part 2-4: Portable general purpose luminaires IEC 60598-1:2020 IEC 60598-2-4:2017
Date of Receipt sample	:	2025-07-16
Date of Test	:	2025-07-16 to 2025-07-27
Date of Issue	:	2025-07-29
Test Report Form No.	:	WSL-6059824I-01B
Test Result	:	**Pass**

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

Prepared By:
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Tested by:

Nicole He

Nicole He

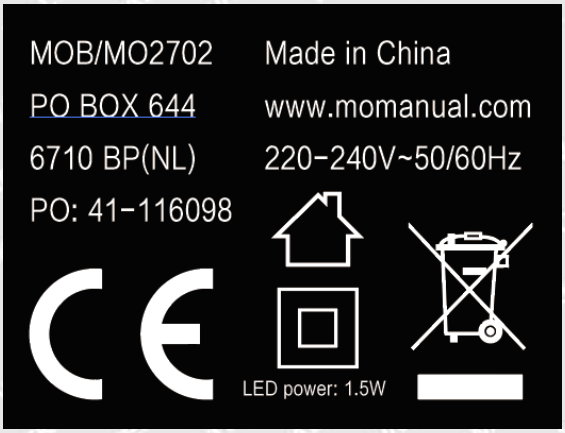
Approved by:

Jerry Mu

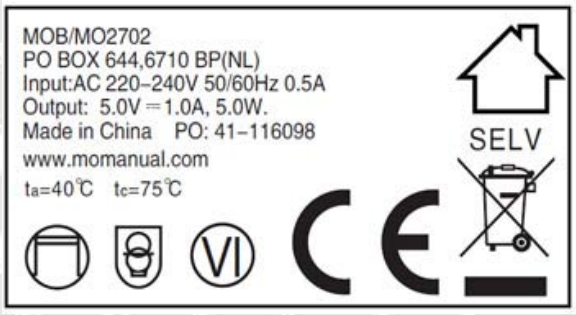
Jerry Mu

Test item description	:	Portable luminaire
Trade Mark	:	MOB
Model/Type reference	:	MO2702
Ratings	:	220-240Vac, 50/60Hz, LED 1.5W, Class II, IP20

Copy of marking plate:



On the luminaire surface



On the LED driver surface

Remark:

1. As declared by the applicant, the importer (and manufacturer, if it is different)'s name, registered trade name or registered trade mark and the postal address will be marked on the products before being place on the market. The contact details shall be in a language easily understood by end-users and market surveillance authorities.
2. Marking on the packaging or in a document accompanying the electrical equipment is only acceptable if it is not possible to place such markings on the product.

Summary of testing:

1. All tests were carried out on representative model MO2702, and found to comply with the requirements of the standards mentioned in page one.
2. EN deviation for IEC 60598-2-4:2017 and IEC 60598-1:2020 was considered and found to comply with the requirement.
3. The LED driver was assessed acc. to EN 61347-2-13:2014+A1:2017 and EN 61347-1:2015+A1:2021, found to comply with the requirement.
4. Integral LED module was assessed according to EN IEC 62031:2020+A11:2021 and found to comply with the requirement.
5. The integral plug was test according to EN 50075:1990 (partially) and the test result complies with the requirement.
6. Retinal blue light hazard was assessed according to IEC/TR 62778:2014, lamp classification group: RG1 unlimited.

7. Assessment of lighting equipment related to human exposure to electromagnetic fields was evaluated and fulfilled the requirements of EN 62493:2015+A1:2022 and found to comply with the requirement.

8. Only the most unfavorable results are recorded in this report.

Test items particulars:

Classification of installation and use	Portable
Supply Connection.....	Direct plug-in LED driver for whole set; DC connector for lamp part

Possible test case verdicts:

- test case does not apply to the test object ..... :	N (Not applicable)
- test object does meet the requirement ..... :	P (Pass)
- test object does not meet the requirement ..... :	F (Fail)

General remarks:

"(see remark #)" refers to a remark appended to the report.
"(see appended table)" refers to a table appended to the report.
Throughout this report a point is used as the decimal separator.

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

No decision rule is specified by the 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”).

General product information:

Portable general purpose luminaires. For indoor use only and suitable for mounting on the normally flammable surface.

IEC 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict

4.4 (0)	**GENERAL TEST REQUIREMENTS**		P
4.4 (0.3)	More sections applicable.....	Yes ☐ No ☒ Section/s:	—
4.4 (0.5)	Components	(see Annex 1)	—
4.4 (0.7)	**Information for luminaire design in light sources standards**		—
4.4 (0.7.2)	Light source safety standard	IEC 62031	—
	Luminaire design in the light source safety standard		P

4.5 (2)	**CLASSIFICATION OF LUMINAIRES**		P
4.5 (2.2)	Type of protection	Class II	P
4.5 (2.3)	Degree of protection	IP 20	—
4.5 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces.....	Yes ☒ No ☐	—
4.5 (2.5)	Luminaire for normal use	Yes ☒ No ☐	—
	Luminaire for rough service	Yes ☐ No ☒	—
4.5.1 (-)	Ordinary luminaire classified “for indoor use only”	Yes ☒ No ☐	—
	Luminaires other than ordinary classified “for indoor use only”.....	Yes ☐ No ☒	—
	Luminaires other than ordinary classified for “outdoor use” and “for indoor use”.....	Yes ☐ No ☒	—
4.5.2 (-)	Portable luminaire for outdoor use classified IPX4 or higher		N
4.5.3 (-)	Luminaires designed for standing on a floor or table classified as suitable for direct mounting on normally flammable surfaces		P

4.6 (3)	**MARKING**		P
4.6 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
4.6 (3.3)	Additional information		P
	Language of instructions	English	P
4.6 (3.3.1)	Combination luminaires		N
4.6 (3.3.2)	Nominal frequency in Hz	50/60Hz	P
4.6 (3.3.3)	Operating temperature		N

IEC 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict
4.6 (3.3.5)	Wiring diagram		N
4.6 (3.3.6)	Special conditions		N
4.6 (3.3.7)	Metal halide lamp luminaire – warning		N
4.6 (3.3.8)	Limitation for semi-luminaires		N
4.6 (3.3.9)	Power factor and supply current		N
4.6 (3.3.10)	Suitability for use indoors		N
4.6 (3.3.11)	Luminaires with remote control		N
4.6 (3.3.12)	Clip-mounted luminaire – warning		N
4.6 (3.3.13)	Specifications of protective shields		N
4.6 (3.3.14)	Symbol for nature of supply	~	P
4.6 (3.3.15)	Rated current of socket outlet		N
4.6 (3.3.16)	Rough service luminaire		N
4.6 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments		N
4.6 (3.3.18)	Non-ordinary luminaires with PVC cable		N
4.6 (3.3.19)	Protective conductor current in instruction if applicable		N
4.6 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N
4.6 (3.3.21)	Non replaceable and non-user replaceable light sources information provided		N
4.6 (3.3.22)	Controllable luminaires, classification of insulation provided		N
4.6 (3.3.23)	Luminaires without controlgear provided with necessary information for selection of appropriate component		N
4.6 (3.3.24)	If not supplied with terminal block, information on the packaging		N
4.6 (3.3.25)	Luminaires employing light sources emitting UV on mains wiring, information provided		N
4.6 (3.3.26)	Wall mounted luminaire using external flexible cable or cord longer than 0.3 m, information provided		N
4.6 (3.4)	Test with water	15s	P
	Test with hexane	15s	P
	Legible after test		P
	Label attached		P
4.6.1 (-)	Luminaire not suitable for outdoor application		N
	Required symbol		N

IEC 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict
	Information in the instructions		N
4.6.2 (-)	Outdoor use, socket outlet incorporated in the luminaire		N
	Maximum power rating marked		N
	Position of the marking		N
4.7 (4)	**CONSTRUCTION**		P
4.7 (4.2)	Components replaceable without difficulty		N
4.7 (4.3)	Wireways smooth and free from sharp edges		P
4.7 (4.4)	**Lampholders**		**N**
4.7 (4.4.1)	Integral lampholder		N
4.7 (4.4.2)	Wiring connection		N
4.7 (4.4.3)	Lampholder for end-to-end mounting		N
4.7 (4.4.4)	Positioning		N
	- pressure test (N)		—
	After test the lampholder comply with relevant standard sheets and show no damage		N
	After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation		N
	- bending test (N)	--	—
	After test the lampholder has not moved from its position and show no permanent deformation		N
4.7 (4.4.5)	Peak pulse voltage		N
4.7 (4.4.6)	Centre contact		N
4.7 (4.4.7)	Parts in rough service luminaires resistant to tracking		N
4.7 (4.4.8)	Lamp connectors		N
4.7 (4.4.9)	Caps and bases correctly used		N
4.7 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N
4.7 (4.5)	**Starter holders**		**N**
	Starter holder in luminaires other than class II		N
	Starter holder class II construction		N
4.7 (4.6)	**Terminal blocks**		**N**
	Tails		N

IEC 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict
	Unsecured blocks		N
4.7 (4.7)	**Terminals and supply connections**		**P**
4.7 (4.7.1)	Contact to metal parts		P
4.7 (4.7.2)	Test 8 mm live conductor		N
	Test 8 mm earth conductor		N
4.7 (4.7.3)	Terminals for supply conductors		N
4.7 (4.7.3.1)	Welded method and material		N
	- stranded or solid conductor		N
	- spot welding		N
	- welding between wires		N
	- Type Z attachment		N
	- mechanical test according to 15.6.2		N
	- electrical test according to 15.6.3		N
	- heat test according to 15.6.3.2.3 and 15.6.3.2.4		N
4.7 (4.7.4)	Terminals other than supply connection		N
4.7 (4.7.5)	Heat-resistant wiring/sleeves		N
4.7 (4.7.6)	Multi-pole plug		N
	- test at 30 N		N
4.7 (4.8)	**Switches**		**N**
	- adequate rating		N
	- adequate fixing		N
	- polarized supply		N
	- compliance with IEC 61058-1 for electronic switches		N
4.7 (4.9)	**Insulating lining and sleeves**		**N**
4.7 (4.9.1)	Retainment		N
	Method of fixing	--	N
4.7 (4.9.2)	Insulated linings and sleeves:		N
	Resistant to a temperature > 20 °C to the wire temperature or		N
	a) & c) Insulation resistance and electric strength		N
	b) Ageing test. Temperature (°C)		N
4.7 (4.10)	**Double or reinforced insulation**		**P**

IEC 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict
4.7 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		P
	Safe installation fixed luminaires		N
	Capacitors and switches		N
4.7 (4.10.2)	Assembly gaps:		N
	- not coincidental		N
	- no straight access with test probe		N
4.7 (4.10.3)	Retainment of insulation:		P
	- fixed		P
	- unable to be replaced; luminaire inoperative		P
	- sleeves retained in position		P
	- lining in lampholder		N
4.7 (4.10.4)	Protective impedance device		N
	Basic and supplementary insulation bridged by resistor(s) or appropriate capacitor		N
	Double or reinforced insulation bridged by at least two separate resistors in series or appropriate capacitor(s)		N
	Capacitors comply with IEC 60384-14		N
	Resistors comply with test (a) in 14.2 of IEC 60065		N
4.7 (4.11)	**Electrical connections and current-carrying parts**		**P**
4.7 (4.11.1)	Contact pressure		P
4.7 (4.11.2)	Screws:		N
	- self-tapping screws		N
	- thread-cutting screws		N
4.7 (4.11.3)	Screw locking:		N
	- spring washer		N
	- rivets		N
4.7 (4.11.4)	Material of current-carrying parts		P
4.7 (4.14.5)	No contact to wood or mounting surface		P
4.7 (4.14.6)	Electro-mechanical contact systems		P
4.7 (4.12)	**Screws and connections (mechanical) and glands**		**N**
4.7 (4.12.1)	Screws not made of soft metal		N
	Screws of insulating material		N
	Torque test: torque (Nm); part.....		N

IEC 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict
	Torque test: torque (Nm); part		N
4.7 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N
4.7 (4.12.4)	Locked connections:		N
	- fixed arms; torque (Nm).....	--	N
	- lampholder; torque (Nm)	--	N
	- push-button switches; torque 0,8 Nm.....		N
4.7 (4.12.5)	Screwed glands; force (Nm).....		N
4.7 (4.13)	**Mechanical strength**		**P**
4.7 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm).....		N
	- other parts; energy (Nm)	All enclosure & lamp cover: 0.5Nm	P
	1) live parts		P
	2) linings		P
	3) protection		P
	4) covers		P
4.7 (4.13.2)	Metal parts have adequate mechanical strength		P
4.7 (4.13.3)	Straight test finger	30N	P
4.7 (4.13.4)	Rough service luminaires		N
	- IP54 or higher		N
	a) fixed		N
	b) hand-held		N
	c) delivered with a stand		N
	d) for temporary installations and suitable for mounting on a stand		N
4.7 (4.13.6)	Tumbling barrel		P
4.7 (4.14)	**Suspensions, fixings and means of adjusting**		**N**
4.7 (4.14.1)	Mechanical load:		N
	A) four times the weight		N
	B) torque 2,5 Nm		N
	C) bracket arm; bending moment (Nm).....		N
	D) load track-mounted luminaires		N
	E) clip-mounted luminaires, glass-shelve. Thickness (mm)		N
	Metal rod. diameter (mm)		N

IEC 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict
	Fixed luminaire or independent control gear without fixing devices		N
4.7 (4.14.2)	Load to flexible cables		N
	Mass (kg)		—
	Stress in conductors (N/mm²)		N
	Mass (kg) of semi-luminaire		N
	Bending moment (Nm) of semi-luminaire		N
4.7 (4.14.3)	Adjusting devices:		N
	- flexing test; number of cycles		N
	- strands broken.....		N
	- electric strength test afterwards		N
4.7 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N
4.7 (4.14.5)	Guide pulleys		N
4.7 (4.14.6)	Strain on socket-outlets		P
4.7 (4.15)	**Flammable materials**		**P**
	- glow-wire test 650°C	See table 4.15c (13.3.2)	P
	- spacing ≥30 mm		N
	- screen withstanding test of 13.3.1		N
	- screen dimensions		N
	- no fiercely burning material		P
	- thermal protection		N
	- electronic circuits exempted		N
4.7 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		N
	a) construction		N
	b) temperature sensing control		N
	c) surface temperature		N
4.7 (4.16)	**Luminaires for mounting on normally flammable surfaces**		**P**
	No lamp control gear	(compliance with Section 12)	P
	Provided with adaptor for a track meet the requirements for direct mounting on normally flammable surfaces		N
4.7 (4.16.1)	Lamp control gear spacing:		N
	- spacing 35 mm		N
	- spacing 10 mm		N
4.7 (4.16.2)	Thermal protection:		N

IEC 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict
	- in lamp control gear		N
	- external		N
	- fixed position		N
	- temperature marked lamp control gear		N
4.7 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N
4.7 (4.17)	**Drain holes**		**N**
	Clearance at least 5 mm		N
4.7 (4.18)	**Resistance to corrosion**		**N**
4.7 (4.18.1)	- rust-resistance		N
4.7 (4.18.2)	- season cracking in copper		N
4.7 (4.18.3)	- corrosion of aluminium		N
4.7 (4.19)	Ignitors compatible with ballast		N
4.7 (4.20)	Rough service vibration		N
4.7 (4.21)	**Protective shield**		**N**
4.7 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N
	Shield of glass if tungsten halogen lamps		N
4.7 (4.21.2)	Particles from a shattering lamp not impair safety		N
4.7 (4.21.3)	No direct path		N
4.7 (4.21.4)	Impact test on shield		N
	Glow-wire test on lamp compartment.....	See Test Table 1.15 (13.3.2)	N
4.7 (4.22)	Attachments to lamps not cause overheating or damage		N
4.7 (4.23)	Semi-luminaires comply Class II		N
4.7 (4.24)	**Photobiological hazards**		**P**
4.7 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N
4.7 (4.24.2)	Retinal blue light hazard		P
	Class of risk group assessed according to IEC/TR 62778	RG1 unlimited	—
	Luminaires with E_{thr} :		N
	a) Fixed luminaires		N
	- distance x m, borderline between RG1 and RG2		N
	- marking and instruction according 3.2.23		N
	b) Portable and handheld luminaires		N

IEC 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict
	- marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778		N
	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
4.7 (4.25)	**Mechanical hazard**		**P**
	No sharp point or edges		P
4.7 (4.26)	**Short-circuit protection**		**N**
4.7 (4.26.1)	Adequate means of uninsulated accessible SELV or PELV parts		N
4.7 (4.26.2)	Short-circuit test with test chain according 4.26.3		N
	Supply source ES1 PSE		N
	Test chain not melt through		N
	Test sample not exceed values of Table 12.1 and 12.2		N
4.7 (4.27)	**Terminal blocks with integrated screwless protective earthing contacts**		**N**
	Test according Annex V		N
	Pull test of terminal fixing (20 N)		N
	After test, resistance < 0,05 Ω		N
	Pull test of mechanical connection (50 N)		N
	After test, resistance < 0,05 Ω		N
	Voltage drop test, resistance < 0,05 Ω		N
4.7 (4.28)	**Fixing of thermal sensing control**		**N**
	Not plug-in or easily replaceable type		N
	Reliably kept in position		N
	No adhesive fixing if UV radiations from a lamp can degrade the fixing		N
	Not outside the luminaire enclosure		N
	Test of adhesive fixing:		N
	Max. temperature on adhesive material (°C)		—
	100 cycles between t_{min} and t_{max}		N
	Temperature sensing control still in position		N
4.7 (4.29)	**Luminaires with non-replaceable light source**		**N**
	Not possible to replace light source		N
	Live part not accessible after parts have been opened by hand or tools		N

IEC 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict
4.7 (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
	At least one fixing means requiring use of tool	5VDC (SELV), no electric shock risk	N
4.7 (4.31)	**Insulation between circuits**		**N**
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3		N
	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
4.7 (4.31.1)	SELV or PELV circuits		P
	Used SELV or PELV source		P
+	Voltage ≤ ELV		P
	Insulating of SELV or PELV circuits from LV supply		P
	Insulating of SELV or PELV circuits from other non SELV or PELV circuits		P
	Insulating of SELV or PELV circuits from FELV		N
	Insulating of SELV or PELV circuits from other SELV or PELV circuits		N
	SELV or PELV circuits insulated from accessible parts according Table X.1		P
	Plugs not able to make any electrical contact with socket-outlets of other voltage systems		N
	Socket outlets does not admit plugs of other voltage systems		N
	Plugs and socket-outlets does not have protective conductor contact		N
4.7 (4.31.2)	FELV circuits		N
	Used FELV source		N
	Voltage ≤ ELV		N
	Insulating of FELV circuits from LV supply		N
	FELV circuits insulated from accessible parts according Table X.1		N
	Plugs not able to make any electrical contact with socket-outlets of other voltage systems		N
	Socket outlets does not admit plugs of other voltage systems		N

IEC 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict
	Socket-outlets have protective conductor contact		N
4.7 (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
	- conductive parts are connected together		N
	- test according 7.2.3		N
	- conductive part does not cause an electric shock in case of an insulation fault		N
	- equipotential bonding in master/slave applications		N
	- master luminaire provided with terminal for accessible conductive parts of slave luminaires		N
	- slave luminaire constructed as class I		N
4.7 (4.32)	**Overvoltage protective devices**		**N**
	Comply with IEC 61643-11		N
	External to controlgear and connected to earth:		N
	- only in fixed luminaires		N
	- only connected to protective earth		N
4.7 (4.33)	**Luminaire powered via information technology communication cabling**		**N**
	Requirements for Class III luminaire		N
	Rated voltage within the range of ES1 and does not exceed maximum voltage of used connector		N
	Luminaire does not create any hazard from overvoltage	(see Annex 2)	N
4.7 (4.34)	**Electromagnetic fields (EMF)**		**P**
	No harmful electromagnetic fields		P
4.7 (4.35)	**Protection against moving fan blades**		**N**
	Test with a standard test finger		N
	Test with test probe acc. to Figure 13 (IEC 61032) for portable luminaire		N
	Blades rounded with radius ≥ 0.5 mm and:		N
	- hardness less than D60 Shore		N
	- peripheral speed less than 15 m/s		N
	- input power of fan ≤ 2 W at rated voltage		N
4.7 (4.36)	**Track-mounted luminaires**		**N**

IEC 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict
	Test in accordance with Annex A of IEC60570:2003/AMD2:2019		N
4.7.1 (-)	Insulation not damaged when moving, adjusting or placing on support		P
4.7.2 (-)	Wiring fixed, to avoid rubbing		P
	Carrier or clips of insulation material or with insulating lining		P
4.7.3 (-)	Luminaire does not overturn:		P
	- at an angle of 6° for indoor use		P
	- at an angle 15° for outdoor use		N
4.7.4 (-)	Candlestick luminaires provided with switch		N
	Switch in candlestick luminaires with E5 or E10 lampholders switches all lamps on and off simultaneously		N
	Switch part of the luminaire or within 300 mm of the luminaire if with cord		N
4.7.5 (-)	Voltage not exceeding 25 V for E5 lampholders		N
	E10 lampholder voltage:		N
	- not exceeding 60 V for series connection		N
	- not exceeding 250 V for parallel connection		N
	Maximum rated wattage does not exceed 100 W		N
4.7.6 (-)	Tails not provided for luminaires for outdoor use		N
4.7.7 (-)	Not more than two cable entries for luminaires for outdoor use		N
4.7.8 (-)	Portable luminaires for outdoor use, socket-outlet degree of protection at least same as the luminaire but not less than IPX4.		N
	Degree of protection maintained with or without a plug inserted into the socket-outlet.		N
	Class II luminaires, mains socket-outlets comply with the standard and only allow connection to Class II luminaires		N
	Class I luminaires, mains socket-outlets comply with the standard and only allow connection to Class I or Class II luminaires		N
4.7.9 (-)	Lampholders and plugs resistant to tracking for luminaires for outdoor use	See Test Table 4.16 (13.4)	N
	Compliance to clause 13.4		N

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Clause	Requirement + Test	Result - Remark	Verdict

4.8 (11)	**CREEPAGE DISTANCES AND CLEARANCES**		**P**
4.8 (11.2.1)	Impulse withstand category (Normal category II)	Category II ☒ Category III ☐	—
	Category III according Annex U		N
	Protected against pollution, reduced creepage and clearance according Annex P of IEC 61347-1		N
4.8 (11.2.2)	Creepage distances for frequency up to 30 kHz	See Test Table 4.8 (11.2) I	P
	Creepage distances for frequency over 30 kHz:		N
	- Controlgear marked with $\hat{U}_{OUT}$ and f_{UOUT} according IEC 61347-1, clause 7.1, item w	See Test Table 4.8 (11.2) II	N
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 4.8 (11.2) II	N
4.8 (11.2.3)	Clearances for frequency up to 30 kHz	See Test Table 4.8 (11.2) I	P
	Clearances distances for frequency over 30 kHz:		N
	- Controlgear marked with U_P	See Test Table 4.8 (11.2) II	N
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 4.8 (11.2) II	N

4.9 (7)	**PROVISION FOR EARTHING**		**N**
4.9 (7.2.1 + 7.2.3)	Accessible metal parts		N
	Metal parts in contact with supporting surface		N
	Resistance < 0,5 Ω		N
	Self-tapping screws used		N
	Thread-forming screws		N
	Thread-forming screw used in a grove		N
	Protective earth makes contact first		N
	Terminal blocks with integrated screwless protective earthing contacts tested according Annex V		N
	Protective earthing of the luminaire not via built-in control gear		N
4.9 (7.2.2 + 7.2.3)	Protective earthing continuity in joints, etc.		N
4.9 (7.2.4)	Locking of clamping means		N
	Compliance with 4.7.3		N
4.9 (7.2.5)	Earth terminal integral part of connector socket		N
4.9 (7.2.6)	Earth terminal adjacent to mains terminals		N

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Clause	Requirement + Test	Result - Remark	Verdict
4.9 (7.2.7)	Electrolytic corrosion of the protective earth terminal		N
4.9 (7.2.8)	Material of protective earth terminal		N
	Contact surface bare metal		N
4.9 (7.2.10)	Class II luminaire for looping-in		N
	Double or reinforced insulation to functional earth		N
4.9 (7.2.11)	Protective earthing core coloured green-yellow		N
	Length of protective earthing conductor		N
4.9 (7.2.12)	PELV circuit connected to protective earth for functional purpose		N
4.10 (14)	**SCREW TERMINALS**		**N**
	Separately approved; component list	(see Annex 1)	N
	Part of the luminaire.....	(see Annex 3)	N
4.10 (15)	**SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS**		**N**
	Separately approved; component list	(see Annex 1)	N
	Part of the luminaire.....	(see Annex 4)	N
4.11 (5)	**EXTERNAL AND INTERNAL WIRING**		**P**
4.11 (5.2)	**Supply connection and external wiring**		**P**
4.11 (5.2.1)	Means of connection	Direct plug-in LED driver for whole set; DC connector for lamp part	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
4.11 (5.2.2)	Type of cable	see Annex 1	N
	Nominal cross-sectional area (mm²).....	see Annex 1	N
	Cables equal to IEC 60227 or IEC 60245		N
4.11 (5.2.3)	Type of attachment, X, Y or Z		N
4.11 (5.2.5)	Type Z not connected to screws		N
4.11 (5.2.6)	Cable entries:		N
	- suitable for introduction		N
	- adequate degree of protection		N

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Clause	Requirement + Test	Result - Remark	Verdict
4.11 (5.2.7)	Cable entries through rigid material have rounded edges		N
4.11 (5.2.8)	Insulating bushings:		N
	- suitably fixed		N
	- material in bushings		N
	- material not likely to deteriorate		N
	- tubes or guards made of insulating material		N
4.11 (5.2.9)	Locking of screwed bushings		N
4.11 (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
4.11 (5.2.10.1)	Cord anchorage for type X attachment:		N
	a) at least one part fixed		N
	b) types of cable		N
	c) no damaging of the cable		N
	d) whole cable can be mounted		N
	e) no touching of clamping screws		N
	f) metal screw not directly on cable		N
	g) replacement without special tool		N
	Glands not used as anchorage		N
	Labyrinth type anchorages		N
4.11 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		N
4.11 (5.2.10.3)	Tests:		N
	- impossible to push cable; unsafe		N
	- pull test: 25 times; pull (N).....		N
	- torque test: torque (Nm)		N
	- displacement ≤ 2 mm		N
	- no movement of conductors		N
	- no damage of cable or cord		N
	- function independent of electrical connection		N

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Clause	Requirement + Test	Result - Remark	Verdict
4.11 (5.2.10.4)	Luminaire with/designed for use with supply cord with maximum current of 2A:		P
	- Ordinary Class III luminaire supplied with SELV ≤ 25V RMS/60V DC		P
	- Ordinary Class III luminaire supplied with PELV ≤ 12V RMS/30V DC		N
	- Other than ordinary Class III luminaire supplied with voltage ≤ 12V RMS/30V DC		N
	Pull test of 30 N		P
4.11 (5.2.11)	External wiring passing into luminaire		P
4.11 (5.2.12)	Looping-in terminals		N
4.11 (5.2.13)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N
4.11 (5.2.14)	Mains plug same protection		P
	Class III luminaire plug		N
	No unsafe compatibility		P
4.11 (5.2.15)	Connectors for Class III luminaires (IEC 60603 or IEC 62680)		N
4.11 (5.2.16)	Appliance inlets (IEC 60320)		N
	Installation couplers (IEC 61535)		N
	Appliance inlet or connector systems (IEC 61984)		N
4.11 (5.2.17)	No standardized interconnecting cables properly assembled		N
4.11 (5.2.18)	Used plug in accordance with		P
	- IEC 60083		N
	- other standard		P
4.11 (5.3)	**Internal wiring**		**P**
4.11 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		N
	- not delivered/ mounting instruction		N
	- factory assembled		N
	- socket outlet loaded (A).....		N
	- temperatures	(see Annex 2)	N
	Green-yellow for protective earth only		N

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Clause	Requirement + Test	Result - Remark	Verdict
4.11 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P
	Cross-sectional area (mm²)	see Annex 1	P
	Insulation thickness (mm)		P
	Extra insulation added where necessary		N
4.11 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		P
	Cross-sectional area (mm²)		P
4.11 (5.3.1.3)	Double or reinforced insulation for class II		P
4.11 (5.3.1.4)	Conductors without insulation		N
4.11 (5.3.1.5)	SELV or PELV current-carrying parts		P
4.11 (5.3.1.6)	Insulation thickness other than PVC or rubber		N
4.11 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N
	Joints, raising/lowering devices		N
	Telescopic tubes etc.		N
	No twisting over 360°		P
4.11 (5.3.3)	Insulating bushings:		P
	- suitable fixed		P
	- material in bushings		P
	- material not likely to deteriorate		P
	- cables with protective sheath		P
4.11 (5.3.4)	Joints and junctions effectively insulated		N
4.11 (5.3.5)	Strain on internal wiring		P
4.11 (5.3.6)	Wire carriers		N
4.11 (5.3.7)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N
4.11 (5.4)	**Test to determine suitability of conductors having a reduced cross-sectional area**		**P**
	Under test the temperature of the luminaire wiring insulation does not exceed the limits stated in Table 12.2	(see Annex 2)	P
	No damage to luminaire wiring after test		P
4.11.1 (-)	Cord anchorage of luminaire for indoor use made of glass or ceramic not fixed or integral		N
4.11.2 (-)	For Class I and Class II luminaires for indoor use, if:		P
	- mass < 1 kg (kg)		N
	- rated current ≤ 2,5 A (A)		N

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Clause	Requirement + Test	Result - Remark	Verdict
	- cable length ≤ 2 m (m).....		N
	- the nominal cross-sectional area of copper conductor ≥ 0,5 mm² (mm²)	SELV external wiring	P
4.11.3 (-)	Terminals, cord anchorage and inlet opening provided for luminaire for outdoor use delivered without a flexible cable or cord and a plug.		N
4.11.4 (-)	Non-detachable flexible cables or cords not lighter than type 245 IEC 57 for Class I and Class II luminaires for outdoor use.		N
4.12 (8)	**PROTECTION AGAINST ELECTRIC SHOCK**		**P**
4.12 (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		N
	Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements		P
	Basic insulation only accessible under lamp or starter replacement		P
	Protection in any position		P
	Double-ended tungsten filament lamp		N
	Insulation lacquer not reliable		N
	Double-ended high-pressure discharge lamp		N
	Relevant warning according to 3.2.18 fitted to the luminaire		N
4.12 (8.2.2)	Portable luminaire adjusted in most unfavourable position		P
4.12 (8.2.3.a)	Class II luminaire:		P
	- basic insulated metal parts not accessible		N
	- required insulation from live parts in compliance with Table X.1		P
	- glass protective shields not used as supplementary insulation		N
4.12 (8.2.3.b)	Metal BC lampholder in class I luminaires connected to protective earth		N

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Clause	Requirement + Test	Result - Remark	Verdict
4.12 (8.2.3.c)	SELV circuits with exposed current carrying parts:		P
	Ordinary luminaire:		P
	- voltage under load/ no-load AC (V).....		N
	- voltage under load/ no-load DC (V).....	5Vdc	P
	- interrupted DC voltage (V).....		N
	- touch current if applicable (mA)		N
	One conductive part insulated		N
	Other than ordinary luminaire:		N
	- voltage under load/ no-load AC (V).....		N
	- voltage under load/ no-load DC (V).....		N
	- interrupted DC voltage (V).....		N
4.12 (8.2.3.d)	PELV circuits with exposed current carrying parts:		N
	Ordinary luminaire:		N
	- voltage under load/ no-load AC (V).....		N
	- voltage under load/ no-load DC (V).....		N
	Other than ordinary luminaire:		N
	- voltage under load/ no-load AC (V).....		N
	- voltage under load/ no-load DC (V).....		N
	Pole not connected to earth insulated		N
	Class III luminaire only for connection to SELV or PELV		N
4.12 (8.2.4)	Portable luminaire has protection independent of supporting surface		P
4.12 (8.2.5)	Compliance with the standard test finger or relevant probe		P
4.12 (8.2.6)	Covers reliably secured		P
4.12 (8.2.7)	Luminaire other than below with capacitor > 0,5 μF not exceed 50 V 1 min after disconnection		N
	Portable luminaire with capacitor > 0,1 μF (0,25) not exceed 34 V 1 s after disconnection		P
	Other luminaires with capacitor > 0,1 μF (0,25) with plug and track adaptors not exceed 60 V 5 s after disconnection		N
4.12 (-)	Class I luminaire with bayonet lampholder:		N
	1) cap not accessible with test finger		N
	2) metal lampholder is earthed		N

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Clause	Requirement + Test	Result - Remark	Verdict

4.13 (12)	**ENDURANCE TEST AND THERMAL TEST**		P
4.13 (-)	If IP > IP 20 relevant test of (12.4), (12.5), (12.6) and (12.7) after (9.2) but before (9.3) specified in 4.14		—
4.13 (12.2)	**Selection of lamps and ballasts**		—
	Lamp used according Annex B	(Lamp used see Annex 2)	—
	Controlgear if separate and not supplied	(Controlgear used see Annex 2)	—
4.13 (12.3)	**Endurance test**		**P**
	a) mounting-position	As in normal used	—
	b) test temperature (°C).....	35 °C	—
	c) total duration (h)	240 h	—
	d) supply voltage (V).....	1.1Un	—
	d) if not equipped with controlgear, constant voltage/current (V) or (A)		—
1.13 (12.3.1d)	d) Class III luminaires powered via information technology communication cable:		—
	- voltage under normal operation (V).....		—
	- voltage under abnormal operation (V).....		—
	e) luminaire ceases to operate		—
	f) luminaire with a constant light output function		N
4.13 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N
	- marking legible		P
	- no cracks, deformation etc.		P
4.13 (12.4)	**Thermal test (normal operation)**	(Annex 2)	P
4.13 (12.5)	**Thermal test (abnormal operation)**	(Annex 2)	N
4.13 (12.6)	**Thermal test (failed lamp control gear condition):**		**N**
4.13 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A)		—
	- case of abnormal conditions.....		—
	- electronic lamp control gear		N
	- measured winding temperature (°C): at 1,1 Un .		—
	- measured mounting surface temperature (°C) at 1,1 Un		N

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Clause	Requirement + Test	Result - Remark	Verdict
	- calculated mounting surface temperature (°C) ..		N
	- track-mounted luminaires		N
4.13 (12.6.2)	Temperature sensing control		N
	- case of abnormal conditions.....		—
	- thermal link		N
	- manual reset cut-out		N
	- auto reset cut-out		N
	- measured mounting surface temperature (°C) ..		N
	- track-mounted luminaires		N
4.13 (12.7)	**Thermal test (failed lamp control gear in plastic luminaires):**		**N**
4.13 (12.7.1)	Luminaire without temperature sensing control		N
4.13 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N
	Test method 12.7.1.1 or Annex W		—
	Test according to 12.7.1.1:		N
	- case of abnormal conditions.....		—
	- Ballast failure at supply voltage (V)		—
	- Components retained in place after the test		N
	- Test with standard test finger after the test		N
	Test according to Annex W:		N
	- 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
4.13 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N
	- 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
4.13 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N

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Clause	Requirement + Test	Result - Remark	Verdict
	- case of abnormal conditions.....		—
	- Components retained in place after the test		N
	- Test with standard test finger after the test		N
4.13 (12.7.2)	Luminaire with temperature sensing control		N
	- 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 4.15 (13.2.1)	N
4.13 (-)	Luminaire for indoor use tested in overturned position (overturns < 15°)	Not overturn	N
4.14 (9)	**RESISTANCE TO DUST AND MOISTURE**		**P**
4.14 (-)	If IP > IP 20 the order of tests as specified in clause 4.13		N
4.14 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP	IP20	—
	- mounting position during test	As in normal used	—
	- fixing screws tightened; torque (Nm).....	--	—
	- tests according to clauses	9.2.0	—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N
	b) no talcum in dust-tight luminaire		N
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		N
	c.1) For luminaires without drain holes – no water entry		N
	c.2) For luminaires with drain holes – no hazardous water entry		N
	d) no water in watertight, pressure watertight, high pressure and temperature water jet-proof or high pressure and cold-water jet-proof luminaire		N
	e) no contact with live parts (IP 2X)		P
	e) no entry into enclosure (IP 3X and IP 4X)		N

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Clause	Requirement + Test	Result - Remark	Verdict
	e) no contact with live parts through drain holes and ventilation slots (IP3X and IP4X)		N
	f) no trace of water on part of lamp requiring protection from splashing water		N
	g) no damage of protective shield or glass envelope		N
4.14 (9.3)	Humidity test 48 h		P
4.15 (10)	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		**P**
4.15 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø :	Covered by metal foil	P
	Insulation resistance (MΩ):		P
	SELV or PELV:		P
	- between current-carrying parts of different polarity:		N
	- between current-carrying parts and mounting surface	100 MΩ	P
	- between current-carrying parts and metal parts of the luminaire	100 MΩ	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts	100 MΩ	P
	- Insulation bushings as described in Section 5 ..	100 MΩ	P
	Other than SELV or PELV:		P
	- between live parts of different polarity.....	Approved LED driver	P
	- between live parts and mounting surface.....	100 MΩ	P
	- between live parts and metal parts.....	100 MΩ	P
	- between live parts of different polarity through action of a switch	--	N
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts	--	N
	- Insulation bushings as described in Section 5 ..	--	N
4.15 (10.2.2)	Electric strength test		P
	Dummy lamp		N
	Luminaires with ignitors after 24 h test		N
	Luminaires with manual ignitors		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Luminaires with ignitors provided with ballasts conforming to IEC 61347-2-9		N
	SELV or PELV:		P
	- between current-carrying parts of different polarity		N
	- between current-carrying parts and mounting surface	500 V	P
	- between current-carrying parts and metal parts of the luminaire	500 V	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts	500 V	P
	- Insulation bushings as described in Section 5 ..	500 V	P
	Other than SELV/PELV:		P
	- between live parts of different polarity.....	Approved LED driver	P
	- between live parts and mounting surface.....	2960 V	P
	- between live parts and metal parts.....	2960 V	P
	- between live parts of different polarity through action of a switch	--	N
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts	--	N
	- Insulation bushings as described in Section 5 ..	--	N
4.15 (10.3)	Touch current (mA).....	0.0196 mA	P
	Protective conductor current (mA).....	--	N

4.16 (13)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		**P**
4.16 (13.2.1)	Ball-pressure test.....	See Test Table 4.16 (13.2.1)	P
4.16 (13.3.1)	Needle-flame test (10 s)	See Test Table 4.16 (13.3.1)	P
4.16 (13.3.2)	Glow-wire test (650°C)	See Test Table 4.16 (13.3.2)	P
4.16 (13.4)	Proof tracking test (IEC 60112)	See Test Table 4.16 (13.4)	N

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Clause	Requirement + Test	Result - Remark	Verdict

4.8 (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 11.1A*, 11.1B* and 11.2*							**P**
	Insulation type **	**Measured clearance**	**Required**		**Measured creepage**	**Required**		
			clearance	***Table**		**creepage**	***Table**	
Distance 1:								
Working voltage (V) ..... :					--			—
PTI ..... :					< 600 ☐	≥ 600 ☐		—
Pulse voltage if applicable (kV) ..... :					--			—
Supplementary information: Approved SELV LED driver (5VDC max.)								
Distance 2:								
Working voltage (V) ..... :					--			—
PTI ..... :					< 600 ☐	≥ 600 ☐		—
Pulse voltage if applicable (kV) ..... :					--			—
Supplementary information:								
Distance 3:								
Working voltage (V) ..... :					--			—
PTI ..... :					< 600 ☐	≥ 600 ☐		—
Pulse voltage if applicable (kV) ..... :					--			—
Supplementary information:								

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Clause	Requirement + Test	Result - Remark	Verdict

4.8 (11.2)	TABLE II: Creepage distances and clearances							N
	Minimum distances (mm) for a.c. higher than 30 kHz sinusoidal voltages							
	Applicable part of IEC 61347-1 Table 7 and 8* or IEC 60664-4 Table 1 and 2							
Distances	**Insulation type ****	**Measured clearance**	**Required**		**Measured creepage**	**Required**		
			clearance	***Table**		**creepage**	***Table**	
Distance 1:								
Working voltage (V) ..... :								—
Frequency if applicable (kHz) ..... :								—
PTI ..... :					< 600 ☐		≥ 600 ☐	—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :								—
Supplementary information:								
Distance 2:								
Working voltage (V) ..... :								—
Frequency if applicable (kHz) ..... :								—
PTI ..... :					< 600 ☐		≥ 600 ☐	—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :								—
Supplementary information:								
Distance 3:								
Working voltage (V) ..... :								—
Frequency if applicable (kHz) ..... :								—
PTI ..... :					< 600 ☐		≥ 600 ☐	—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :								—
Supplementary information:								
** Insulation type: B – Basic; S – Supplementary; R – Reinforced.								

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Clause	Requirement + Test	Result - Remark	Verdict

4.16 (13.2.1)	TABLE: Ball Pressure Test of Thermoplastics			P
Allowed impression diameter (mm) .....:		**2**		—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
USB contact	See Annex 1	125	1.35	
DC connector	See Annex 1	125	1.34	
Supplementary information:				

4.16 (13.3.1)	TABLE: Needle-flame test (IEC 60695-11-5)				P
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
USB contact	See Annex 1	10	No	0	P
DC connector	See Annex 1	10	No	0	P
Supplementary information:					

4.16 (13.3.2)	TABLE: Glow-wire test (IEC 60695-2-11)			P
Glow wire temperature .....:		650°C		—
Object/ Part No./ Material	Manufacturer/ trademark	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Plastic cover for LED (gray)	See Annex 1	No	0	P
Plastic base (white)	See Annex 1	No	0	P
Supplementary information:				

4.16 (13.4)	TABLE: Proof tracking test (IEC 60112)				N
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 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 1 components				**P**
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity
Output wire of LED driver	YUYAO DONGHAI SPECIAL WIRE FACTORY	2464/2468	300VAC; 80°C; 22-26AWG	--	UL E212811
Plastic material of USB port	YUYAO TENGLONG PLASTICS &CHEMICAL CO LTD	GF30	PBT; V-0	--	UL E227661
DC connector	KINGFA SCI & TECH CO LTD	PA66-G50 (f1)	PA66; HB	--	UL E171666
Lead wire to LED	Yuyao Xin Riyue Wire & Cable Industry Co., Ltd	1007	300VAC; 80°C; 24AWG	--	UL E256446
Alternative	YUYAO DONGHAI SPECIAL WIRE FACTORY	1007	300VAC; 80°C; 24AWG	--	UL E212811
LED	Shenzhen Xuyu Optoelectronics Co., Ltd	SMD-2835	IF=60mA; 3073K	IEC/TR 62778	Tested with appliance
LED board	GOLDENMAX INTERNATIONAL TECHNOLOGY (ZHUHAI) LTD	GDM-R1	V-0; 130°C; Al.	--	UL E330731
Plastic cover for LED (gray)	CHI MEI CORPORATION	PC-110	PC; V-2	--	UL E56070
Plastic base (white)	FORMOSA CHEMICALS & FIBRE CORP PLASTICS DIV	AG15E1	ABS; HB	--	UL E162823
Heat-shrinkable tube	SHENZHEN WOER HEAT-SHRINKABLE MATERIAL CO LTD	RSFR-H	600V; 125°C	--	UL E203950
Alternative	Dongguan Yongchao New Material Co Ltd	YC-DWT	600V; 125°C	--	UL E484474
Sleeving	DONGGUAN YONGCHAO INSULATION MATERIAL CO LTD	YC-15-25-40-70	VW-1	--	UL E325767
Components for LED driver					
Plastic enclosure	YUYAO TENGLONG PLASTICS &CHEMICAL CO LTD	GF30	PBT; V-0	--	UL E227661
Pin	Jiang Lingxiang Electronics Co., Ltd.	2.1	Cu:59%	--	Tested with appliance
PCB	KINGBOARD LAMINATES HOLDINGS LTD	KB-5150	V-0; 130°C	--	UL E123995
Fuse resistor	Shenzhen Great Electronics Co. Ltd.	RXF	2W; 18Ω	IEC 62368-1	VDE 40026608
Y1 capacitor	JYH HSU (JEC) ELECTRONICS LTD	JD	440VAC; 1000pF; T125	IEC 60384-14	VDE 40038642

IEC 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict

Insulation tape	JINGJIANG JINGYI ADHESIVE PRODUCT CO LTD	JY25-A(b)	130°C	--	UL E246950
Bobbin	Chang Chun Plastics Co Ltd	T375J	150°C	--	UL E59481
Magnet wire	ZHEJIANG HONGBO TECHNOLOGY CO LTD	UEW/130	130°C	--	UL E221719
Triple insulated winding wires for transformer	Shenzhen Darun Science and Technology Co., Ltd	DRTIW-B	130°C	IEC 62368-1	VDE 40032470
Teflon tube for transformer	CHANGYUAN ELECTRONICS GROUP CO LTD	CB-TT-S	200°C	--	UL E180908

IEC 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	**TABLE: Temperature measurements, thermal tests of Section 12**	P

	Type reference ..... :	MO2702	—
	Lamp used ..... :	LED	—
	Lamp control gear used ..... :	SELV driver	—
	Mounting position of luminaire ..... :	Acc. to user manual	—
	Supply wattage (W) ..... :	--	—
	Supply current (A) ..... :	--	—
	Calculated power factor ..... :	--	—
	Table: measured temperatures corrected for ta = 25 °C:		P
	- abnormal operating mode ..... :	--	—
	- test 1: rated voltage ..... :	--	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage ..... :	1.06 times rated voltage	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :	--	—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage ..... :	--	—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :	--	—

Temperature measurements, (°C)

Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
The plug interface of LED driver	25.0	--	29.0	--	70	--	--
tc of LED driver	25.0	--	35.4	--	75	--	--
USB contact	25.0	--	29.0	--	Ref.	--	--
Output wire of driver	25.0	--	27.2	--	80	--	--
DC connector	25.0	--	26.7	--	Ref.	--	--
Varistor	25.0	--	42.6	--	Ref.	--	--
Lead wire to LED	25.0	--	29.9	--	80	--	--
Plastic cover for LED (gray)	25.0	--	31.2	--	Ref.	--	--
Plastic base (white)	25.0	--	25.2	--	Ref.	--	--
LED board	25.0	--	31.9	--	Ref.	--	--

IEC 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict

Mounting surface	25.0	--	26.4	--	90	--	--
Illuminated surface (0.1m)	25.0	--	26.6	--	90	--	--
Plastic enclosure, inside	25.0	--	33.0	--	Ref.	--	--
PCB	25.0	--	35.5	--	Ref.	--	--
Y1 capacitor	25.0	--	32.3	--	125	--	--
Primary winding of TR4	25.0	--	36.1	--	120	--	--
Secondary winding of T	25.0	--	34.0	--	120	--	--
Bobbin of T	25.0	--	35.5	--	Ref.	--	--
E-cap EC1	25.0	--	33.9	--	105	--	--
E-cap EC2	25.0	--	34.1	--	105	--	--
E-cap C2	25.0	--	34.3	--	105	--	--

IEC 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict

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

IEC 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict

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

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Clause	Requirement + Test	Result - Remark	Verdict

(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....:		N
(15.6.2.2)	Pull test pin or tab terminals (4 samples); pull (N) .....:		N
(15.6.3)	Electrical tests		N
	Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1		N

(15.6.3.1) (15.6.3.2)	**TABLE: Contact resistance test / Heating tests**									**N**
	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:										

EN 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 5	**National Differences for (country name) or Group Differences**	**P**
	CENELEC COMMON MODIFICATIONS (EN)	P

ATTACHMENT TO TEST REPORT IEC 60598-2-4
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES
Luminaires
Part 2: Particular Requirements:
SECTION 4: PORTABLE GENERAL PURPOSE LUMINAIRES

Differences according to.....: EN 60598-2-4:2018 used in conjunction with EN IEC 60598-1:2021+A11:2022

Annex Form No.....: --

Annex Form Originator.....: --

Master Annex Form.....: --

	CENELEC COMMON MODIFICATIONS (EN)	P

4.5 (3)	**MARKING**		**N**
4.5 (3.3.101)	For luminaires not supplied with terminal block: Adequate warning on the package		N

4.6 (4)	**CONSTRUCTION**		**P**
4.6 (4.11.6)	Electro-mechanical contact systems		P

4.10 (5)	**EXTERNAL AND INTERNAL WIRING**		**P**
4.10 (5.2.1)	Connecting leads		N
	- without a means for connection to the supply		N
	- terminal block specified		N
	- relevant information provided		N
	- compliance with 4.6, 4.7.1, 4.7.2, 4.10.1, 11.2, 12 and 13.2 of Part 1		N
4.10 (5.2.2)	Cables equal to EN 50525		N
	Replace table 5.1 – Supply cord		N

EN 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict
4.12 (12)	**ENDURANCE TESTS AND THERMAL TESTS**		N
4.12 (12.4.2c)	Thermal test (normal operation) see footnote c to table 12.2 relating to unsleeved fixed wiring		N
ZB	**ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)**		**N**
(3.3)	DK: power supply cords of class I luminaires with label		N
(4.5.1)	DK: socket-outlets		N
(5.2.1)	CY, DK, FI, GB: type of plug		N
ZC	**ANNEX ZC, NATIONAL DEVIATIONS (EN)**		**N**
(4 & 5)	FR: Shuttered socket-outlets 10/16A		N
	FR: Safety requirements for high buildings (Arrêté du 30 décembre 2011 portant règlement de sécurité pour la construction des immeubles de grande hauteur et leur protection contre les risques d'incendie et de panique; Section VIII; Article GH 48, Eclairage) Glow-wire test for outer parts of luminaires:		N
	- 850°C for luminaires in stairways and horizontal travel paths		N
	- 650°C for indoor luminaires		N
(13.3)	GB: Requirements according to United Kingdom Building Regulation		N

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

ANNEX 6	**Lamp controlgear - Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules IEC 61347-1:2015+A1:2017 and IEC 61347-2-13:2014+A1:2016**	**P**

4 (4)	**GENERAL REQUIREMENTS**		**P**
- (4)	Insulation materials according requirements in Annex N of IEC 61347-1	(see Annex N)	P
- (4)	Compliance of independent controlgear enclosure with IEC 60598-1		P
- (4)	Built-in electronic controlgear with double or reinforced insulation comply with Annex O of IEC 61347-1	(see Annex O)	N
4 (4)	SELV controlgear comply with Annex I of this part 2 and Annex L of IEC 61347-1	(see Annex L)	P
4 (-)	Transformer comply with IEC 61558		P
	Dielectric strength test of insulated winding wires is limited to 3 kV if input voltage ≤ 300 V		P

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

7 (7)	**MARKING**		**P**
7.1 (7.1)	**Mandatory markings**		**P**
	a) mark of origin	See copy of marking plate	P
	b) model number or type reference	See copy of marking plate	P
	c) symbol for independent controlgear, if applicable		P
	d) correlation between interchangeable parts and controlgear marked		N
	e) rated supply voltage (V)		P
	supply frequency (Hz)		P
	supply current (A)	See copy of marking plate	P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	f) earthing symbol		N
	k) wiring diagram		P
	l) value of tc	See copy of marking plate	P
	m) symbol for declared temperature		N
	t) LUM earthing symbol		N
	u) if not SELV maximum working voltage U_{out} between:		N
	- output terminals (V) ..... :		N
	- output terminals and earth (V) ..... :		N
7.1 (-)	Constant voltage type:	Yes ☐ No ☒	—
	- rated output power P_{rated} (W) ..... :	--	N
	- rated output voltage U_{rated} (V) ..... :	--	N
	Constant current type:	Yes ☒ No ☐	—
	- rated output power P_{rated} (W) ..... :	See copy of marking plate	P
	- rated output current I_{rated} (A) ..... :	See copy of marking plate	P
	Indication if for LED modules only		P
7.1 (7.2)	Marking durable and legible		P
	Rubbing 15 s water, 15 s petroleum; marking legible		P
7.2 (7.1)	**Information to be provided, if applicable**		**P**
	h) declaration of protection against accidental contact		N
	i) cross-section of conductors (mm²)		P
	j) number, type and wattage of lamp(s)		P
	s) SELV symbol		P
7.2 (-)	- declaration of mains connected windings		N

8 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		**P**
- (10.1)	Controlgear protected against accidental contact with live parts	Rely on plastic enclosure	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)	P
- (10.1)	Lacquer or enamel not used for protection or insulation		P
	Adequate mechanical strength on parts providing protection		P

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Clause	Requirement + Test	Result - Remark	Verdict
- (10.2)	Capacitors > 0,5 μF: voltage after 1 min (V): < 50 V .....:	Max. 4V	P
- (10.3)	**Controlgear providing SELV**		**P**
	Accessible conductive parts are insulated from live parts by double or reinforced insulation in SELV controlgear		P
	No connection between output circuit and the body or protective earthing circuit		P
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		P
	SELV outputs separated by at least basic insulation		P
	ELV conductive parts insulated as live parts		N
	Tests according Annex L of IEC 61347-1	(see Annex L)	P
- (10.4)	**Accessible conductive parts in SELV circuits**		**N**
	Output voltage under load ≤ 25 V r.m.s. or ≤ 60 V d.c.		N
	If output voltage > 25 V r.m.s. or > 60 V d.c.; No load output ≤ 35 V peak or ≤ 60 V d.c and touch current does not exceed 0,7 mA (peak) or 2 mA d.c. .....:	--	N
	One conductive part is insulated if output voltage or current exceeding the values above and withstand test voltage 500 V		N
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor	Approved Y1 capacitor use	P
	Y1 or Y2 capacitors comply with IEC 60384-14		P
	Resistors comply with test (a) in 14.1 of IEC 60065		N

9 (8)	**TERMINALS**		**P**
	Screw terminals according section 14 of IEC 60598-1:		P
	Separately approved; component list	(see Annex 1)	P
	Part of the controlgear	(see Annex 2)	N
	Screwless terminals according section 15 of IEC 60598-1:		**N**
	Separately approved; component list	(see Annex 1)	N
	Part of the controlgear	(see Annex 3)	N

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

10 (9)	**PROVISION FOR PROTECTIVE EARTHING**		**N**
- (9.1)	**Provisions for protective earthing**		**N**
	Terminal complying with clause 8		N
	Locked against loosening and not possible to loosen by hand		N
	Not possible to loosen clamping means unintentionally on screwless terminals		N
	All parts of material minimizing the danger of electrolytic corrosion		N
	Made of brass or equivalent material		N
	Contact surface bare metal		N
	Test according 7.2.3 of IEC 60598-1		N
- (9.2)	**Provision for functional earthing**		**N**
	Comply with clause 8 and 9.1		N
	Functional earth insulated from live parts by double or reinforced insulation		N
- (9.3)	**Lamp controlgear with conductors for protective earthing by tracks on printed circuit board**		**N**
	Test with a current of 25 A between earthing terminal or earthing contact and each of the accessible metal parts; measured resistance (Ω) at ≥ 10 A according 7.2.3 of IEC 60598-1: < 0,5 Ω ..... :		N
- (9.4)	**Earthing of built-in lamp controlgear**		**N**
	Earth by means of fixing to earthed metal of luminaire in compliance of 7.2 of IEC 60598-1		N
	Earthing terminal only for earthing the built-in controlgear		N
- (9.5)	**Earthing via independent controlgear**		**N**
- (9.5.1)	Earth connection to other equipment		N
	Looping or through connection, conductor min. 1,5 mm² and of copper or equivalent		N
	Protective earthing wires in line with 5.3.1.1 and clause 7 of IEC 60598-1		N
- (9.5.2)	Earthing of the lamp compartments powered via the independent lamp controlgear		N
	Test with a current of 25 A between input and output earth terminals; measured resistance (Ω) between earthing terminal or earthing contact and each of the accessible metal parts at ≥ 10 A according 7.2.3 of IEC 60598-1: < 0,5 Ω ..... :		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Output earthing terminal marked as in 7.1 t) of IEC 61347-1		N
11 (11)	**MOISTURE RESISTANCE AND INSULATION**		**P**
- (11)	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance:		P
	For basic insulation ≥ 2 MΩ ..... :	>100 MΩ (between different polarities of input, fuse open); (between fuse in and out)	P
	For double or reinforced insulation ≥ 4 MΩ ..... :	>100 MΩ (between input and output circuit), >100 MΩ (between live parts and enclosure)	P
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		P
12 (12)	**ELECTRIC STRENGTH**		**P**
- (12)	Immediately after clause 11 electric strength test for 1 min		P
	Basic insulation for SELV, test voltage 500 V		P
	Working voltage ≤ 50 V, test voltage 500 V		N
	Working voltage > 50 V ≤ 1000 V, test voltage (V):		P
	Basic insulation, 2U + 1000 V	Between L & N (remove fuse): 1480V (Working voltage: 240V)	P
	Supplementary insulation, 2U + 1000 V		N
	Double or reinforced insulation, 4U + 2000 V	Between input circuit and output circuit: 2960V Between live parts and enclosure: 2960V (working voltage: 240V)	P
	No flashover or breakdown		P
	Solid or thin sheet insulation for double or reinforced insulation fulfil the requirements in Annex N in IEC 61347-1		P
14 (14)	**FAULT CONDITIONS**		**P**
- (14.1)	When operated under fault conditions the controlgear:		P
	- does not emit flames or molten material		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- does not produce flammable gases		P
	- protection against accidental contact not impaired		N
	Thermally protected controlgear does not exceed the marked temperature value		N
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	P
- (14.2)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (after any reduction in 14.2 - 14.5)	(see appended table)	N
- (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
- (14.5)	Short-circuit across electrolytic capacitors	(see appended table)	P
14 (-)	Reversed voltage polarity if d.c. supplied control gear	(see appended table)	N
- (14.6)	After the tests has been carried out on three samples:		P
	The insulation resistance ≥ 1 MΩ ..... :	>100 MΩ	P
	No flammable gases		P
	No accessible parts have become live		P
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P
- (14.7)	Relevant fault condition tests with high-power a.c. supply		—
14 (-)	Temperature declared thermally protected lamp controlgear fulfil requirements in Annex C		N
15 (-)	**TRANSFORMER HEATING**		**P**
15.1	**General**		**P**
	Transformer comply with clause L.6 and L.7 of IEC 61347-1		P
	Output voltage of SELV controlgear not exceed limits in 10.4 of IEC 61347-1 during the test of 15.1 and 15.2		P
15.2 (-)	**Normal operation**		**P**
	Comply with clause L.6 of IEC 61347-1		P
15.3 (-)	**Abnormal operation**		**P**

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Clause	Requirement + Test	Result - Remark	Verdict
	Comply with clause L.7 of IEC 61347-1		P
	Double LED modules or equivalent load connected in parallel to the output terminals of constant voltage type		N
	Double LED modules or equivalent load connected in parallel to the output terminals of constant current type		P
15 (-)	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		P
16 (15)	**CONSTRUCTION**		**P**
- (15.1)	**Wood, cotton, silk, paper and similar fibrous material**		**P**
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
- (15.2)	**Printed circuits**		**P**
	Printed circuits used as internal connections complies with clause 14		P
- (15.3)	**Plugs and socket-outlets used in SELV or ELV circuits**		**N**
	No dangerous compatibility between output socket-outlet and a plug for socket-outlets for input circuit in relation to installation rules, voltages and frequencies		N
	Plugs and socket-outlets for SELV comply with IEC 60906-3 and IEC 60884-2-4		N
	Plugs and socket-outlets for SELV ≤ 3 A, ≤ 25 V r.m.s. or ≤ 60 V d.c. and ≤ 72 W comply with IEC 60906-3 and IEC 60884-2-4 or:		N
	- plugs not able to enter socket-outlets of other standardised system		N
	- socket-outlets not admit plugs of other standardised system		N
	- socket-outlets without protective earth		N
- (15.4)	**Insulation between circuits and accessible parts**		**P**
- (15.4.2)	SELV circuits		P
	Source used to supply SELV circuits:		P
	- safety isolating transformer in accordance with relevant part 2 of IEC 61558		N
	- controlgear providing SELV in accordance with relevant part 2 of IEC 61347		P
	- another source		N

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

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Clause	Requirement + Test	Result - Remark	Verdict
	Accessible conductive parts insulated from active parts of electric circuits by insulating according Table 6		N
	Requirements for Class II construction with equipotential bonding for protection against indirect contact with live parts:		N
	- all conductive parts are connected together		N
	- conductive parts are reliably connected together according test of IEC 60598-1 cl. 7.2.3		N
	- conductive parts comply with requirements of Annex A in case of insulation fault		N
17 (16)	**CREEPAGE DISTANCES AND CLEARANCES**		**P**
- (16)	Creepage distances and clearances according to 16.2 and 16.3		P
	Controlgears providing SELV comply with additional requirements in Annex L		P
	Insulating lining of metallic enclosures		P
	Controlgear protected against pollution comply with Annex P	(see Annex P)	N
- (16.2)	**Creepage distances**		**P**
- (16.2.2)	Minimum creepage distances for working voltages		P
	Creepage distances according to Table 7	(see appended table)	P
- (16.2.3)	Creepage distances for working voltages with frequencies above 30 kHz		N
	Creepage distances according to Table 8	(see appended table)	N
- (16.3)	**Clearances**		**P**
- (16.3.2)	Clearances for working voltages		P
	Clearances distances according to Table 9	(see appended table)	P
- (16.3.3)	Clearances for ignition voltages and working voltages with higher frequencies		N
	Clearances distances for basic or supplementary insulation according to Table 10	(see appended table)	N
	Clearances distances for reinforced insulation according to Table 11	(see appended table)	N
18 (17)	**SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS**		**P**
	Screws, current-carrying parts and connections in compliance with IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1)		P
(4.11)	**Electrical connections**		**P**
(4.11.1)	Contact pressure		P

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Clause	Requirement + Test	Result - Remark	Verdict
(4.11.2)	Screws:		N
	- self-tapping screws		N
	- thread-cutting screws		N
(4.11.3)	Screw locking:		N
	- spring washer		N
	- rivets		N
(4.11.4)	Material of current-carrying parts		P
(4.11.5)	No contact to wood or mounting surface		P
(4.11.6)	Electro-mechanical contact systems		P
(4.12)	**Mechanical connections and glands**		**N**
(4.12.1)	Screws not made of soft metal		N
	Screws of insulating material		N
	Torque test: torque (Nm); part ..... :		N
	Torque test: torque (Nm); part ..... :	--	N
	Torque test: torque (Nm); part ..... :	--	N
(4.12.2)	Screws with diameter < 3 mm screwed into metal		N
(4.12.4)	Locked connections:		N
	- fixed arms; torque (Nm)..... :		N
	- lampholder; torque (Nm)..... :		N
	- push-button switches; torque 0,8 Nm..... :		N
(4.12.5)	Screwed glands; force (Nm) ..... :		N

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

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

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Clause	Requirement + Test	Result - Remark	Verdict

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

14	**TABLE: tests of fault condition**	**P**
Part	Simulated fault	Hazard
BD	Test voltage: 240Vac, Short circuit	~~YES~~/NO
U1	Test voltage: 240Vac, Short circuit	~~YES~~/NO
E-cap, EC1	Test voltage: 240Vac, Short circuit	~~YES~~/NO
E-cap, EC2	Test voltage: 240Vac, Short circuit	~~YES~~/NO
E-cap, C2	Test voltage: 240Vac, Short circuit	~~YES~~/NO

17 (16)	**TABLE: clearance and creepage distance measurements (mm)**						P
Applicable part of IEC 61347-1 Table 7 – 11*							
Distances	**Insulation type ****	**Measured clearance**	**Required**		**Measured creepage**	**Required**	
			clearance	***Table**		**creepage**	***Table**
Distance 1:	B	2.51	1.5	9	2.51	2.5	7
Working voltage (V) ..... :					240VAC		—
Frequency if applicable (kHz) ..... :					--		—
PTI ..... :					< 600 ☒	≥ 600 ☐	—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :					--		—
Pulse voltage if applicable (kV) ..... :					--		—
Supplementary information: Two pins of fuse on PCB							
Distance 2:	B	2.6	1.5	9	2.6	2.5	7
Working voltage (V) ..... :					240VAC		—
Frequency if applicable (kHz) ..... :					--		—
PTI ..... :					< 600 ☒	≥ 600 ☐	—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :					--		—
Pulse voltage if applicable (kV) ..... :					--		—
Supplementary information: L to N							
Distance 3:	R	6.0	4.7	13 of IEC 61558-1	6.0	5.0	13 of IEC 61558-1
Working voltage (V) ..... :					240VAC		—
Frequency if applicable (kHz) ..... :					--		—
PTI ..... :					< 600 ☒	≥ 600 ☐	—

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Clause	Requirement + Test	Result - Remark	Verdict

Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :					--		—
Pulse voltage if applicable (kV) ..... :					--		—
Supplementary information: Primary winding/core to secondary winding							
Distance 4:	R	7.0	3.0	9	7.0	5.0	7
Working voltage (V) ..... :					240VAC		—
Frequency if applicable (kHz) ..... :					--		—
PTI ..... :					< 600 ☒	≥ 600 ☐	—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :					--		—
Pulse voltage if applicable (kV) ..... :					--		—
Supplementary information: Primary circuit to secondary circuit (PCB under CY1)							
Distance 5:	R	5.5	3.0	9	5.5	5.0	7
Working voltage (V) ..... :					240VAC		—
Frequency if applicable (kHz) ..... :					--		—
PTI ..... :					< 600 ☒	≥ 600 ☐	—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :					--		—
Pulse voltage if applicable (kV) ..... :					--		—
Supplementary information: Live part and accessible part							

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

19 (18.1)	**TABLE: Ball Pressure Test**		**P**
Allowed impression diameter (mm) ..... :		≤2.0	—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)
PCB	See Annex 1	125.0	1.1
Bobbin	See Annex 1	125.0	1.2
Plastic enclosure	See Annex 1	75.0	1.4
Supplementary information:			

19 (18.2)	**TABLE: Test of printed boards**				**P**
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (s)	Ignition of specified layer Yes/No	Duration of burning (s)	Verdict
PCB	See Annex 1	30	No	0	P
Supplementary information:					

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Clause	Requirement + Test	Result - Remark	Verdict

19 (18.3)	**TABLE: Glow-wire test**			**P**
Glow wire temperature..... :	650°C			—
Object/ Part No./ Material	Manufacturer/ trademark	Ignition of specified layer Yes/No	Duration of burning (s)	Verdict
Plastic enclosure	See Annex 1	No	0	P
Supplementary information:				

19 (18.4)	**TABLE: Needle-flame test**				**P**
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (s)	Ignition of specified layer Yes/No	Duration of burning (s)	Verdict
PCB	See Annex 1	10	No	0	P
Bobbin	See Annex 1	10	No	0	P
Supplementary information:					

19 (18.5)	**TABLE: Proof tracking test**				**P**
Test voltage PTI ..... :	175 V				—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
Bobbin	See Annex 1	50	50	50	P
PCB	See Annex 1	50	50	50	P
Supplementary information:					

(A)	**ANNEX A - TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS A LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK**		**N**
(A.1)	Comply with A.2 or A.3		N
(A.2)	Voltage ≤ 35 V peak or ≤ 60 V d.c ..... :		N
(A.3)	If voltage measured according Clause A.2 exceeds the limit value; touch current does not exceed 0,7 mA (peak) or 2 mA d.c. ..... :		N
	Comply with Annex G.2 of IEC 60598-1		N

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Clause	Requirement + Test	Result - Remark	Verdict
(C)	**ANNEX C – PARTICULAR REQUIREMENTS FOR ELECTRONIC LAMP CONTROLGEAR WITH MEANS OF PROTECTION AGAINST OVERHEATING**		**N**
(C3)	**GENERAL REQUIREMENTS**		**N**
(C3.1)	Thermal protection means integral with the convertor, protected against mechanical damage		N
	Renewable only by means of a tool		N
	If function depending on polarity, for cord-connected equipment protection means in both leads		N
	Thermal links comply with IEC 60691		N
	Electrical controls comply with IEC 60730-2-3		N
(C3.2)	No risk of fire by breaking (clause C7)		N
(C5)	**CLASSIFICATION**		**N**
	a) automatic resetting type		—
	b) manual resetting type		—
	c) non-renewable, non-resetting type		—
	d) renewable, non-resetting type		—
	e) other type of thermal protection; description .. :		—
(C6)	**MARKING**		**N**
(C6.1)	Symbol for temperature declared thermally protected ballasts		N
(C6.2)	Declaration of the type of protection provided		N
(C7)	**LIMITATION OF HEATING**		**N**
(C7.1)	**Preselection test:**		**N**
	Test sample placed for at least 12 h in an oven having temperature (t_c - 5) K		N
	No operation of the protection device		N
(C7.2)	**Functioning of protection means:**		**N**
	Normal operation of the sample in a test enclosure according to Annex D at an ambient temperature such that (t_c +0; -5) °C is obtained		N
	No operation of the protection device		N
	Introducing of the most onerous test condition determined during test of clause 14.2 to 14.5		N
	Output of windings connected to the mains supply short-circuited, and other part of the controlgear operated under normal conditions		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Increasing of the current through the windings continuously until operation of the protection means		N
	Continuous measuring of the highest surface temperature		N
	Ballasts according to C5 a) or C5 e) operated until stable conditions are achieved		N
	Automatic-resetting thermal protectors working 3 times		N
	Ballasts according to C5 b) working 6 times		N
	Ballasts according to C5 c) and C5) d) working once		N
	Highest temperature does not exceed the marked value		N
	Any overshoot of 10% over the marked value within 15 min		N
	After 15 min value not exceed marked value		N
(D)	**ANNEX D – REQUIREMENTS FOR CARRY OUT THE HEATING TESTS OF THERMALLY PROTECTED LAMP CONTROLGEAR**		**N**
	Tests in C7 performed in accordance with Annex D, if applicable		N
(F)	**ANNEX F – DRAUGHT-PROOF ENCOSURE**		**P**
	Draught-proof enclosure in accordance with the description		P
	Dimensions of the enclosure		P
	Other design; description		N
(H)	**ANNEX H - TESTS**		**N**
	All tests performed in accordance with the advice given in Annex H, if applicable		N
I (L)	**ANNEX I IN THIS PART 2 – PARTICULAR ADDITIONAL REQUIREMENTS FOR SELV D.C. OR A.C. SUPPLIED ELECTRONIC CONTROLGEARS FOR LED MODULES**		**P**
(L.3)	**Classification**		**P**
	Class I	Yes ☐ No ☒	—
	Class II	Yes ☒ No ☐	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Class III	Yes ☐ No ☒	—
	non-inherently short circuit proof controlgear	Yes ☒ No ☐	—
	inherently short circuit proof controlgear	Yes ☐ No ☒	—
	fail safe controlgear	Yes ☐ No ☒	—
	non-short-circuit proof controlgear	Yes ☐ No ☒	—
(L.4)	**Marking**		**P**
	Adequate symbols are used		P
(L.5)	**Protection against electric shock**		**P**
	Comply with clause 9.2 of IEC 61558-1		P
(L.6)	**Heating**		**P**
	No excessive temperatures in normal use		P
	Value if capacitor t_c marked .....:	See Annex 1	—
	Winding insulation classified as Class .....:	Class B	—
	Comply with tests of clause 14 of IEC 61558-1 with adjustments		P
(L.7)	**Short-circuit and overload protection**		**P**
	Comply with tests of clause 15 of IEC 61558-1 with adjustments		P
(L.8)	**Insulation resistance and electric strength**		**P**
(L.8.1)	Conditioned 48 h between 91 % and 95 %		P
(L.8.2)	Insulation resistance		P
	Between input- and output circuits not less than 5 MΩ .....:	>100 MΩ	P
	Between metal parts of class II convertors which are separated from live parts by basic insulation only and the body not less than 5 MΩ .....:	--	N
	Between metal foil in contact with the inner and outer surfaces of enclosures of insulating material not less than 2 MΩ .....:	>100 MΩ	P
(L.8.3)	Electric strength		P
	1) Between live parts of input circuits and live parts of output circuits .....:	3000V	P
	2) Over basic or supplementary insulation between:		P
	a) live parts having different polarity .....:	1500V	P
	b) live parts and body if intended to be connected to protective earth .....:	--	N

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Clause	Requirement + Test	Result - Remark	Verdict
	c) accessible metal parts and a metal rod of the same diameter as the flexible cable or cord ..... :	--	N
	d) live parts and an intermediate metal part ..... :	--	N
	e) intermediate metal parts and the body ..... :	--	N
	f) each input circuit and all other input circuits ... :	--	N
	3) Over reinforced insulation between the body and live parts ..... :	3000V	P
(L.9)	**Construction**		**P**
(L.9.1)	Transformer comply with 19.12 of IEC 61558-1 and 19 of IEC 61558-2-6		P
	HF transformer comply with 19 of IEC 61558-2-16		P
(L.10)	**Components**		**P**
	Protective devices comply with 20.6 – 20.11 of IEC 61558-1		P
(L.11)	**Creepage distances, clearances and distances through insulation**		**P**
	Creepage distances and clearances not less than in Clause 16		P
	Distance through insulation according Table L.5 in IEC 61347-1		P
	1) Basic distance through insulation		N
	Required distance (mm) ..... :	--	—
	Measured (mm) ..... :	--	N
	Supplementary information		—
	2) Supplementary distance through insulation		P
	Required distance (mm) ..... :	--	—
	Measured (mm) ..... :	At least 3 layer insulation tape used in transformer, totally thick. 0.15mm	P
	Supplementary information		—
	3) Reinforced distance through insulation		P
	Required distance (mm) ..... :	0.83mm	—
	Measured (mm) ..... :	Min. 1.0mm for enclosure	P
	Supplementary information		—

J (-)	**ANNEX J IN THIS PART 2 – PARTICULAR ADDITIONAL SAFETY REQUIREMENTS FOR A.C., A.C./D.C. OR D.C. SUPPLIED ELECTRONIC CONTROLGEAR FOR EMERGENCY LIGHTING**	**N**
J.1	**General**	**N**

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Clause	Requirement + Test	Result - Remark	Verdict
	Intended for centralized emergency power supply	Yes ☐ No ☐	—
J.2	**Marking**		**N**
J.2.1	Mandatory markings		N
	a) symbol EL		N
	b) rated emergency supply voltage (V)		N
J.2.2	Information to be provided if applicable		N
	a) Limits of ambient temperature		N
	b) Emergency output factor (EOF_X)		N
	c) Information if intended for use in luminaires for high-risk task area lighting		N
J.3	General notes on tests		N
	Length of output cable in tests..... :		N
	Load instead of LED lamps/modules..... :		N
J.4	Starting conditions		N
	Start rated load in emergency mode without adversely affecting the performance		N
J.5	Operating condition		N
	Comply with the requirements of 7.2 of IEC 62384 at 90% and 110% of rated emergency supply voltage		N
J.6	Emergency supply current		N
	Emergency supply current not differ more than ±15 %		N
	Supply of low impedance and low inductance		N
J.7	EMC immunity		N
	Comply with the requirements of IEC 61547		N
J.8	Pulse voltage from central battery systems		N
	Withstand pulses according Table J.1		N
J.9	Tests for abnormal conditions		N
	Comply with the requirements of 12 of IEC 62384		N
J.10	Comply with the requirements of 13 of IEC 62384		N
J.11	Functional safety (EOF_x)		N
	Declared emergency output factor (EOF_x) achieved during emergency operation		N

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Clause	Requirement + Test	Result - Remark	Verdict
(N)	**ANNEX N: REQUIREMENTS FOR INSULATION MATERIALS USED FOR DOUBLE OR REINFORCED INSULATION**		**P**
(N.4)	**General requirements**		**P**
(N.4.1)	Material comply with IEC 60085 and IEC 60216 series		N
(N.4.2)	**Solid insulation**		**N**
	Electric strength test at least 5 kV or 1,35 x test voltage in Table N.1		N
	If not classified according IEC 60085 and IEC 60216 series: Electric strength test increased 10 % of 5,5 kV or 1,5 x test voltage in Table N.1		N
(N.4.3)	**Thin sheet insulation**		**P**
(N.4.3.1)	Thickness and composition of thin sheet insulation		P
	- Inside the ballast and not subjected to handling or abrasion during the production and during maintenance		P
	- Non-separated layers: Min. 3 layers and fulfil mandrel test of 150N		N
	- Separated layers: Min. 2 layers and each layer fulfil mandrel test of 50N		P
	- Separated layers (alternative): Min. 3 layers and 2/3 of the layers fulfil mandrel test of 100N		N
(N.4.3.2)	Mandrel test (electric strength test during mechanical stress)		P
	Electric strength test after mandrel test:		P
	- Non-separated layers: min. 5 kV or 1,35 x test voltage in Table N.1		N
	- 2/3 of min. 3 separated layers: min. 5 kV or 1,25 x test voltage in Table N.1	5000 V	P
	- one of 2 separated layers: min. 5 kV or 1,25 x test voltage in Table N.1		N
	No flashover or breakdown occurred		N
(O)	**ANNEX O: ADDITIONAL REQUIREMENTS FOR BUILT-IN ELECTRONIC CONTROLGEAR WITH DOUBLE OR REINFORCED INSULATION**		**N**
(O.6)	**Marking**		N
	Marking according clause 7 (7)	See clause 7	N
	Special symbol		N
	Meaning of the special symbol explained in catalogue		N
(O.7)	**Protection against accidental contact with live parts**		**N**

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Clause	Requirement + Test	Result - Remark	Verdict
	Requirements of clause 8 (10)	See clause 8	N
	Test finger not possible to make contact with basic insulated metal parts		N
(O.8)	**Terminals**		**N**
	Clause 9 (8)	See clause 9	N
(O.9)	**Provision for earthing**		**N**
	Functional earthing terminals comply with clause 9 of part 1		N
	No protective earthing terminal		N
(O.10)	**Moisture resistance and insulation**		**N**
	Clause 11 (11)	See clause 11	N
(O.11)	**Electric strength**		**N**
	Clause 12 (12)	See clause 12	N
(O.13)	**Fault conditions**		**N**
	Clause 14 (14)	See clause 14	N
	End of test, between live part and accessible metal parts or external parts of insulating material in contact with the supporting surface comply with dielectric strength test reduced to 35 % of values according Table 1 in part 1		N
	Insulation resistance according to O.10 between live part and accessible metal parts or external parts of insulating material in contact with the supporting surface not less than 4 MΩ		N
(O.14)	**Construction**		**N**
	Clause 17 (15)	See clause 17	N
	Accessible metal parts insulated from live parts by double or reinforced insulation		N
	Live part insulated from supporting surface in contact with external faces by double or reinforced insulation		N
(O.15)	**Creepage distances and clearances**		**N**
	Clause 18 (16)	See clause 18	N
	Comply with corresponding values for luminaries in IEC 60598-1		N
(O.16)	**Screws, current-carrying parts and connections**		**N**
	Clause 19 (17)	See clause 19	N
(O.17)	**Resistance to heat and fire**		**N**
	Clause 20 (18)	See clause 20	N

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Clause	Requirement + Test	Result - Remark	Verdict
(O.18)	**Resistance to corrosion**		**N**
	Clause 21 (19)	See clause 21	N
(P)	**Creepage distances and clearances and distance through isolation (DTI) for lamp controlgear which are protected against pollution by the use of coating or potting**		**N**
(P.1)	**General**		**N**
	P.2 applies if creepage distances less than the minimum in Table 7 and 8		N
	P.3 applies if clearance less than the minimum in Table 9, 10 and 11		N
(P.2)	**Creepage distances**		**N**
(P.2.2)	Minimum creepage distances for working voltages and rated voltages with frequencies up to 30 kHz (Table P.1)		N
	Basic or supplementary insulation:		N
	Required creepage ..... :		—
	Measured ..... :		N
	Supplementary information		—
	Reinforced insulation:		N
	Required creepage ..... :		—
	Measured ..... :		N
	Supplementary information		—
(P.2.3)	Creepage distances for working voltages with frequencies above 30 kHz (Table P.2)		N
	Voltage $\hat{U}_{out}$ kV ..... :		—
	Frequency ..... :		—
	Required distance ..... :		—
	Measured ..... :		N
	Supplementary information		—
(P.2.4)	Compliance with the required creepage distances		N
(P.2.4.1)	Compliance in accordance with 16.3.3 and test according P.2.4.2		N
(P.2.4.3)	Electrical tests after conditioning		N
(P.2.4.3.1)	Insulation resistance and electric strength according Clause 11 and 12		N
(P.3)	**Distance through isolation**		**N**
(P.3.4)	Electrical tests after conditioning		N

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

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

ANNEX 7	**EN deviation**	**P**

ATTACHMENT TO TEST REPORT IEC 61347-2-13
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES
Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules

Differences according to.....: EN 61347-2-13:2014+A1:2017 used in conjunction with EN 61347-1:2015+A1:2021

	CENELEC COMMON MODIFICATIONS (EN)	P
	No Common modifications	P

EN 50075			
Clause	Requirement + Test	Result - Remark	Verdict
ANNEX 8	**Partial of EN 50075**		**P**
6	**Marking**		**N**
	Requirements not applicable to the evaluated product		—
7	**Dimensions**		**P**
	Plug shall comply with Standard Sheet 1		**P**
	Between two pins (pin base)	18.0 – 19.2 mm	18.96 mm **P**
	Between two pins (pin top)	17.0 – 18.0 mm	17.89 mm **P**
	Diameter of pin (metallic part)	$4^{\pm 0.06}$ mm	4.0 mm **P**
	Diameter of pin (pin base)	max. 4.0 mm	4.0 mm **P**
	Diameter of pin (middle part)	max. 3.8 mm	3.39 mm **P**
	Pin length	$19^{\pm 0.5}$ mm	18.64 mm **P**
	Length of pin except metal part	$10^{+ 1.0}$ mm	10.26 mm **P**
	Shape of pin top		Round shape **P**
	Length of plug base	$35.3^{\pm 0.7}$ mm	35.38 mm **P**
	Width of plug base	$13.7^{\pm 0.7}$ mm	14.29 mm **P**
	Diagonal dimension of plug base within a distance of 18mm	$<26.1^{\pm 0.5}$ mm $<26.1^{\pm 0.5}$ mm	26.39 mm 26.27 mm **P**
8	**Protection against electric shock**		**P**
8.1	Live parts of the plug not accessible (standard test finger)		**P**
8.2	No connection between one plug-pin and socket outlet		**P**
8.3	External parts of insulating material		**P**
9	**Construction**		**P**
9.1	Plugs are not replaceable		**P**
9.2	Switches, fuse, lampholder not incorporated		**P**
9.3	Solid pins	See clause 13	**P**
	Adequate mechanical strength		**N**
9.4	Pins locked against rotation	See clause 13.1 & 13.4	**P**
	Adequate fixed into the body		**P**
9.5	Kind of connection		**P**

EN 50075			
Clause	Requirement + Test	Result - Remark	Verdict
9.6	Easily to be withdrawn from socket-outlet	Incorporated with adaptor	**P**
10	**Resistance to humidity**		**P**
	Humidity treatment for 48 hours		**P**
11	**Insulation resistance and electric strength**		**P**
11.1	Insulation resistance (500V, min 5MΩ)	10MΩ	**P**
11.2	Electric strength (2000V)	(see appended table)	**P**
13	**Mechanical strength**		**P**
13.1	Pressed with 150N for 5 min		**P**
13.2	Tumbling barrel according to EN Number of cycles:25	Number of cycles: 25 (50 falls)	**P**
	No damages after the test		**P**
	Requirements of clause 7 and 8.2 still fulfilled		**P**
13.3	Rubbing test of plug-pins: 10000 cycles, 4N		**P**
	No damage of the pins		**P**
13.4	Pull test at 70°C with 40N		**P**
	Pins not more than 1 mm displaced		**P**
14	**Resistance to heat and to aging**		**P**
14.1	Sufficient resistant to heat		**P**
14.1.1	After 1 h in heating cabinet at 100°C no damage shown	Tested with adaptor	**P**
14.1.2	After 1 h in heating cabinet at 80°C and a force of 20N through the jaws no damage shown		**P**
14.2	Aging test		**P**
	-at 70°C for 168h		**P**
	-at room temperature for 96h		**P**
	No traces of cloth at a force of 5N		**P**
	No damage leads to non-compliance		**P**
15	**Current-carrying parts and connections resistance to heat and to aging**		**P**
15.1	Connections withstand the mechanical stresses occurring in normal use		**P**
15.2	Contact pressure not through isolating material		**P**

EN 50075			
Clause	Requirement + Test	Result - Remark	Verdict
15.3	Current carrying parts of copper		**P**
	No electroplated coating when part is subjected to mechanical wear		**P**
	Other metals having a mechanical strength, an electrical conductivity and a resistance to corrosion		**N**
16	**Creepage distances, clearances and distances through insulation**		**P**
	Live parts of different polarity: 3mm		**P**
	Through insulation between live parts and accessible surfaces: 1.5mm		**P**
17	**Resistance of insulation material to abnormal heat and fire**		**P**
	Insulating material not unduly affected by abnormal heat and by fire	(see appended table)	**P**

11.1	**TABLE: Insulation resistance measurements**	**P**
Measured between:	Result	
Pins connected together and the body (≥ 5MΩ)	10MΩ	**P**
Each pins in turn and the other, the latter being connected to the body (≥ 5M Ω)	10MΩ	**P**
Note: --		

11.2	**TABLE: electric strength measurements**	**P**
Test voltage applied between:	Test voltage (V)	Break down
Pins connected together and the body	2000	No
Each pins in turn and the other, the latter being connected to the body	2000	No
Note: --		

17.3	**TABLE: Resistance of insulating material to abnormal heat and to fire**	**P**
Parts that retain current-carrying parts in position: 750°C		**P**
Other parts: 650°C		**P**
Note: --		

EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict
ANNEX 9	**LED modules for general lighting – Safety specifications** **EN IEC 62031:2020+A11:2021**		**P**
4	**GENERAL REQUIREMENTS**		P
4.4	Integral modules treated as part of luminaires defined in clause 0.5 of IEC 60598-1		P
4.5	Independent modules complies with requirements in IEC 60598-1		N
5	**GENERAL TEST REQUIREMENTS**		—
5.5	SELV-operated LED modules comply with Annex I of IEC 61347-2-13	(see Annex 1)	N
	General conditions for tests in Annex A	(see Annex A)	N
6	**CLASSIFICATION**		—
	Built-in module ..... :	Yes ☐ No ☒	—
	Independent module ..... :	Yes ☐ No ☒	—
	Integral module ..... :	Yes ☒ No ☐	—
	For Integral module; Note to 1.2.1 in IEC 60598-1 applies.		—
7	**MARKING**		**N**
	Requirements not applicable to the evaluated product.		—
8	**TERMINALS**		**N**
	Screw terminals according section 14 of IEC 60598-1:		N
	Separately approved; component list	(see Annex 2)	N
	Part of the luminaire	(see Annex 3)	N
	Screwless terminals according section 15 of IEC 60598-1:		N
	Separately approved; component list	(see Annex 2)	N
	Part of the luminaire	(see Annex 4)	N
	Connectors according IEC 60838-2-2:		N
	Separately approved; component list	(see Annex 2)	N
9 (9)	**PROVISION FOR PROTECTIVE EARTHING**		**N**
	Requirements not applicable to the evaluated product.		—

EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict

10 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**	**N**
	Requirements not applicable to the evaluated product.	—

11 (11)	**MOISTURE RESISTANCE AND INSULATION**		**P**
	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance with d.c. 500 V (MΩ):		P
	For basic insulation ≥ 2 MΩ .....:	100MΩ	P
	For double or reinforced insulation ≥ 4 MΩ .....:		N
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		N

12 (12)	**ELECTRIC STRENGTH**		**P**
	Immediately after clause 11 electric strength test for 1 min		P
	Basic insulation for SELV, test voltage 500 V		P
	Working voltage ≤ 50 V, test voltage 500 V		N
	Working voltage > 50 V ≤ 1000 V, test voltage (V):		N
	Basic insulation, 2U + 1000 V		N
	Supplementary insulation, 2U + 1000 V		N
	Double or reinforced insulation, 4U + 2000 V		N
	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

13 (14)	**FAULT CONDITIONS**		**P**
- (14)	When operated under fault conditions the controlgear:		P
	- does not emit flames or molten material		P
	- does not produce flammable gases		P
	- protection against accidental contact not impaired		P
	Thermally protected controlgear does not exceed the marked temperature value		N
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	P

EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict
- (14.1)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (except between live parts and accessible metal parts)	(see appended table)	P
	Creepage distances on printed boards less than specified in clause 16 in Part 1 provided with coating according to IEC 60664-3		N
- (14.2)	Short-circuit or interruption of semiconductor devices	(see appended table)	P
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	N
- (14.4)	Short-circuit across electrolytic capacitors	(see appended table)	N
- (14.5)	After the tests has been carried out on three samples:		P
	The insulation resistance ≥ 1 MΩ .....:	100 MΩ	P
	No flammable gases		P
	No accessible parts have become live		P
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P
- (14.6)	Relevant fault condition tests with high-power supply		—
13.2	Module withstands overpower condition >15 min.		P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		N
	During the tests, tissue paper, spread below module, does not ignite		P
15	**CONSTRUCTION**		**P**
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
16	**CREEPAGE DISTANCES AND CLEARANCES**		**P**
	Creepage and distances and clearances in compliance with IEC 60598-1		P
17 (17)	**SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS**		**P**
	Screws, current-carrying parts and connections in compliance with IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1)		P
18 (18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		**N**
	Resistance to Heat, Fire and Tracking in compliance with IEC 61347-1 (clause numbers between parentheses refer to IEC 61347-1)		N
(18.1)	Ball-pressure test:		N

EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict
	- part tested; temperature (°C)..... :	--	N
(18.2)	Test of printed boards		N
	- part tested..... :	--	N
(18.3)	Glow-wire test (650°C):		N
	- part tested..... :	--	N
(18.4)	Needle flame test (10 s):		N
	- part tested..... :	--	N
(18.5)	Tracking test:		N
	- part tested..... :	--	N
19 (19)	**RESISTANCE TO CORROSION**		**N**
	Rust protection:		N
	- test according 4.18.1 of IEC 60598-1		N
	- adequate varnish on the outer surface		N
20	**INFORMATION FOR LUMINAIRE DESIGN**		**N**
	Information in Annex D		—
21	**HEAT MANAGEMENT**		**N**
21.1	General		N
	Exchangeability is safeguarded by cap or base		N
21.2	Heat-conducting foil and paste		N
	Heat-conducting foil delivered with the module if necessary		N
21.4	Construction		N
	Electrical connection and mechanical holding are separate		N
22	**Photobiological safety**		**P**
22.1	UV radiation		N
22.2	Blue light hazard		P
	RG at 200 mm according to IEC/TR 62778		P
22.3	Infrared radiation		N

EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict
A	**ANNEX A - TESTS**		**P**
	All tests performed in accordance with the advice given in Annex H of IEC 61347-1, if applicable		P
	ANNEX 1 - SELV-operated LED modules		**N**
	SELV-operated LED modules in compliance with Annex I of IEC 61347-2-13		N

IEC/TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

Annex 10	**Retinal blue light hazard Of Lamps And Lamp Systems IEC/TR 62778:2014**	**P**

	TABLE: Spectroradiometric measurement		**P**
	Measurement performed on:	☐ **LED package** ☐ **LED module** ☐ **Lamp** ☒ **Luminaire**	—
	Model number.....:	MO2702	—
	Test voltage (V) .....:	240V	—
	Test current (mA) .....:	--	—
	Test frequency (Hz).....:	--	—
	Ambient, t (°C) .....:	25.3	—
	Measurement distance.....:	☒ 20 cm ☐ ... cm	—
	Source size .....:	☒ Non-small ☐ Small : .... mm	—
	Field of view .....:	☐ 100 mrad ☒ 11 mrad ☐ 1,7 mrad (for small sources)	—

Item	Symbol	Units	Result	Remark
Correlated colour temperature	CCT	K	/	—
x/y colour coordinates	---	---	/	—
Blue light hazard radiance	L_B	$W/(m^2 \cdot sr^1)$	1.580e+002	—
Blue light hazard irradiance	E_B	W/m^2	/	—
Luminance	L	cd/m^2	5.646e+005	—
Illuminance	E	lx	/	—
Lamp classification group: RG1 unlimited				

EN 62493			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 11	**Assessment Of Lighting Equipment Related To Human Exposure To Electromagnetic Fields according to standard EN 62493:2015+A1:2022**	**P**

4	**LIMITS**		**P**
4.1	**General**		**P**
	Comply with Van der Hoofden test limit in 4.2.3 or inherently compliant in 4.2.2 and pass assessment procedure for intentional radiators in 4.3		P
4.2	**Unintentional radiating part of lighting equipment**		**P**
4.2.2	Lighting equipment deemed to comply with the Van der Hoofden test without testing		P
	1) electronic controlgear	Yes ☐ No ☐	—
	2) incandescent-lamp technology	Yes ☐ No ☐	—
	3) LED-light-source technology	Yes ☒ No ☐	—
	4) OLED-light-source technology	Yes ☐ No ☐	—
	5) high-pressure discharge lamp LED-light-source technologies	Yes ☐ No ☐	—
	6) low-pressure discharge lamp technologies with exposure distance ≥ 50 cm	Yes ☐ No ☐	—
	7) independent auxiliary	Yes ☐ No ☐	—
	Not fulfil any of 1-7 above subject to 4.2.3		—
4.2.3	Applications of limits		N
	Not fulfil any of 1-7 in 4.2.2 but the compliance factor F is ≤ 1		N
4.3	**Intentional radiating part of lighting equipment**		**N**
	Comply with one of methods in Clause 7 if intentional radiator		N

6	**MEASUREMENT PROCEDURE FOR THE VAN DER HOOFDEN TEST**		**N**
6.1	**General**		**N**
	Measurements carried out under conditions according Clause 6.1 – 6.6	See Table 6	N

7	**ASSESSMENT PROCEDURE INTENTIONAL RADIATORS**		**N**
7.2	**Low-power exclusion method**		**N**
7.2.1	Input $P_{int,rad}$		—
	Exclusion level P_{max}.....		—
	Input power $P_{int,rad}$ < exclusion level P_{max}		N

EN 62493			
Clause	Requirement + Test	Result - Remark	Verdict

7.3	**Application of the EMF product standard for body worn-equipment**		**N**
	If not Clause 7.2 is met and expose distance ≤ 0.05 m, comply with IEC 62209-2		N
7.4	**Application of the EMF product standard for base stations**		**N**
	If not Clause 7.2 is met and if intentional radiator is base station, comply with IEC 62232		N
7.5	**Application of another EMF standard**		**N**
	If not Clause 7.2 is met and if intentional radiator cannot be considered as in Clause 7.3 or 7.4, comply with IEC 62311		N

6	**TABLE: Measurement results with Van der Hoofden test head**				**N**
Location of EUT	Test model	Measuring distance	Result(F)	Limit(F)	Verdict
Reference Annex B of EN 62493:2015+A1:2022	--	--	--	≤1.0	N

====== End of Report ======

Photo Documentation

Model: MOB

Photo 1

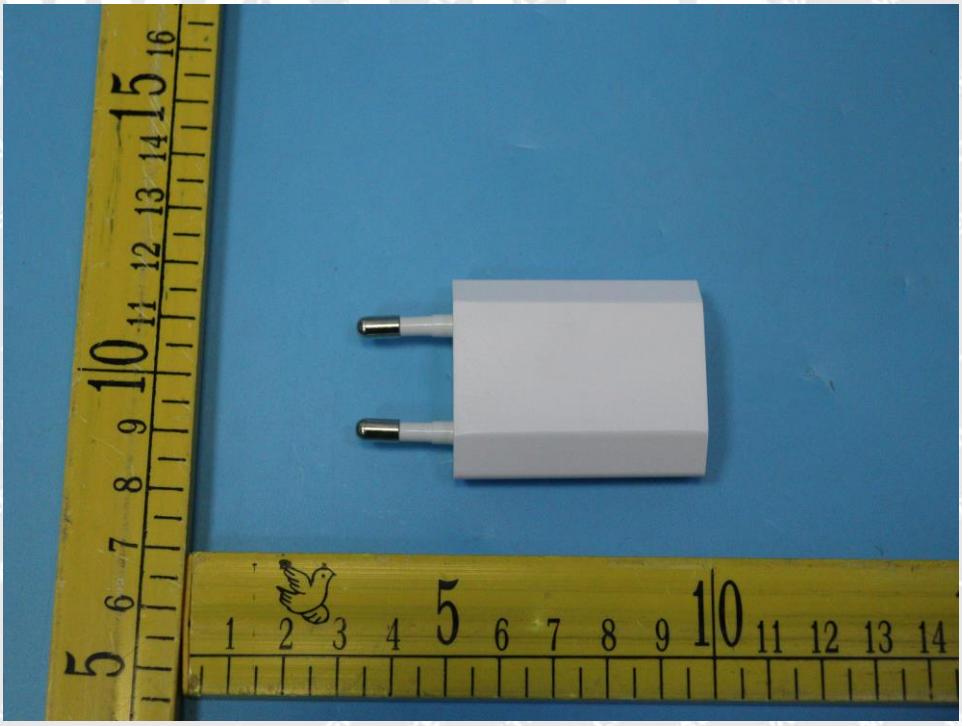

Photo 2

Photo Documentation

Photo 3

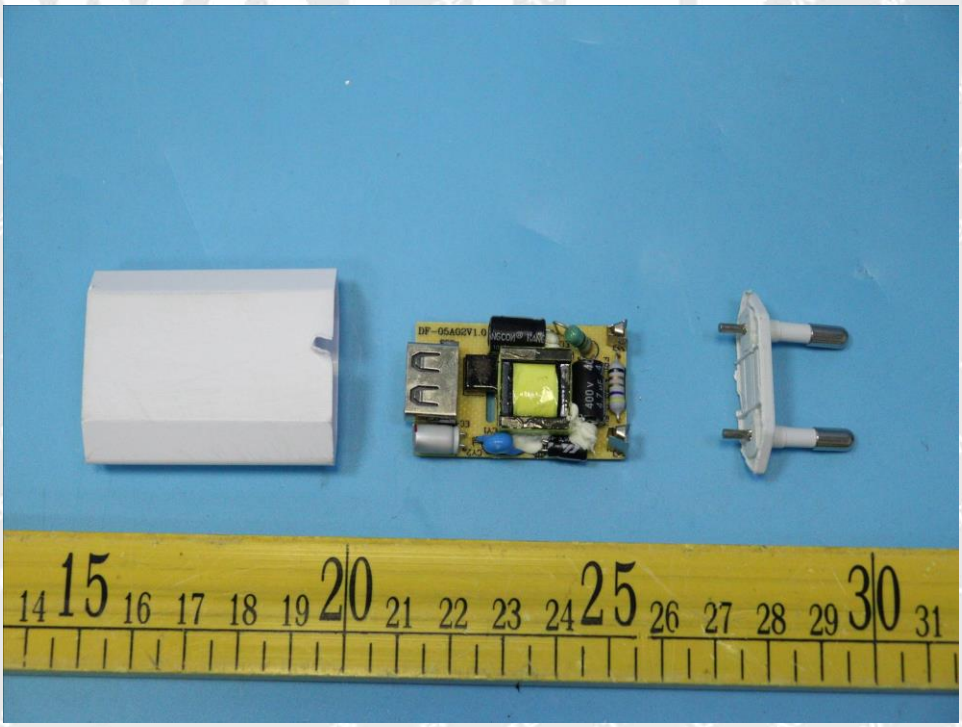

Photo 4

Photo Documentation

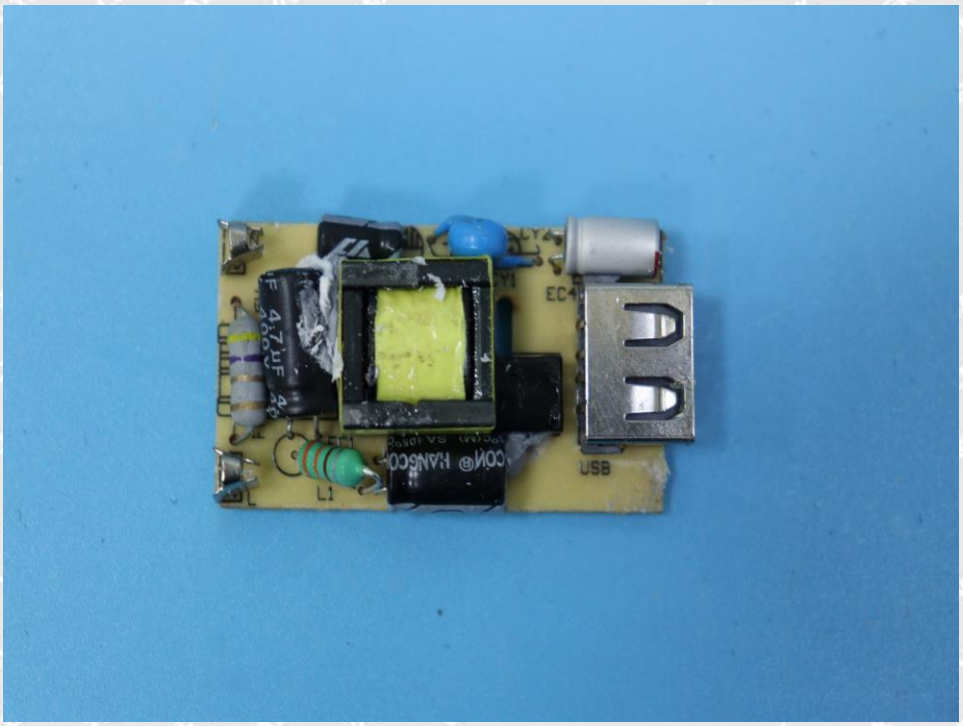

Photo 5

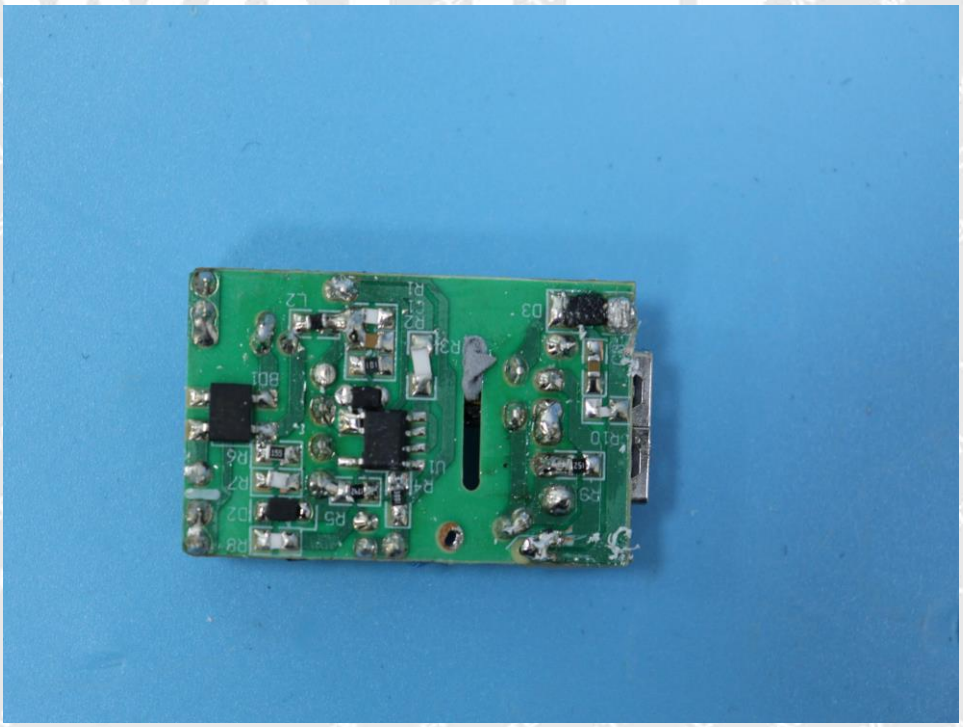

Photo 6

Photo Documentation

Photo 7

Photo 8

Photo Documentation

Photo 9

Photo 10

Photo Documentation

Photo 11

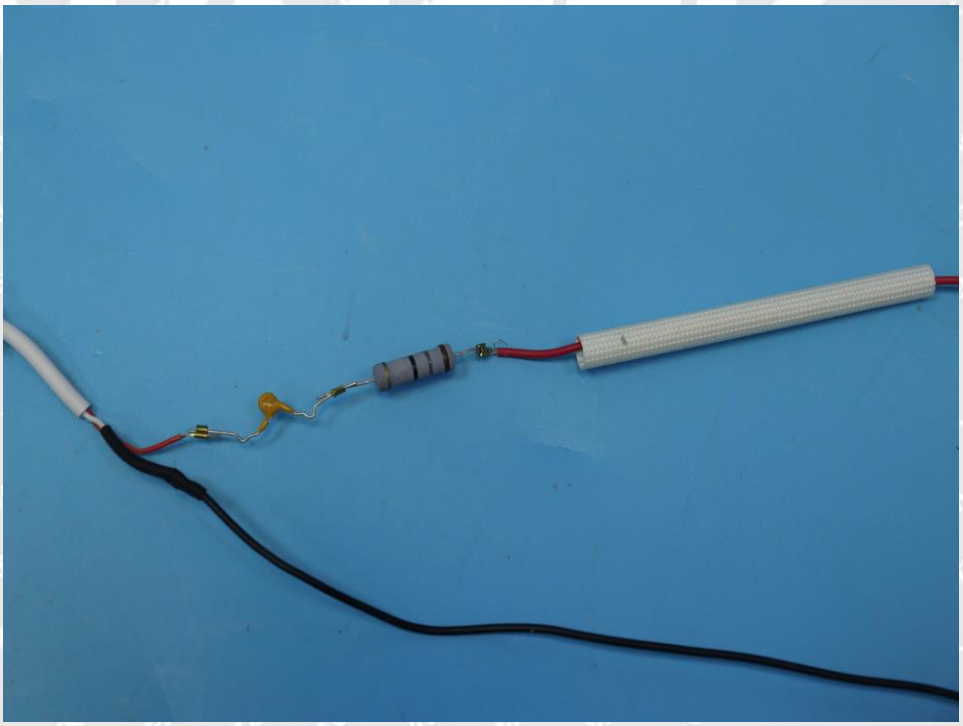

Photo 12

Photo Documentation

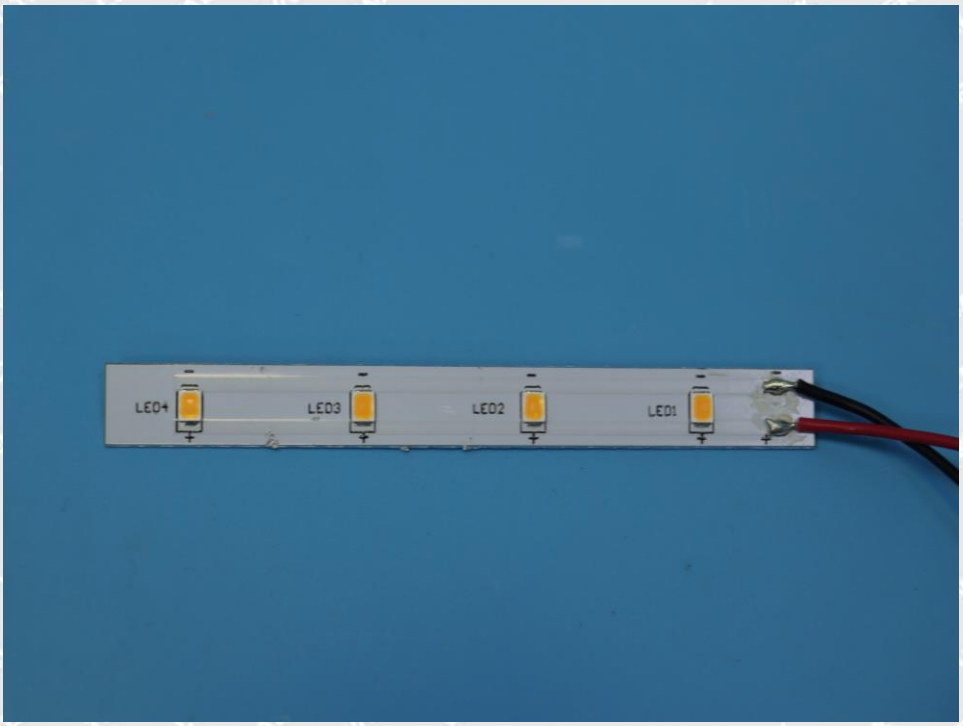

Photo 13

====== End of Photo ======

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检测
TESTING
CNAS L6478

TEST REPORT

Reference No.	:	WTF25F05115218N
Applicant	:	Mid Ocean Brands B.V.
Address	:	Unit 711-716, 7/F., Tower A, 83 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong.
Manufacturer	:	114901
Address	:	114901
Product Name	:	AC/DC ADAPTER
Model No.	:	MO2702
Test specification	:	COMMISSION REGULATION (EU) 2019/1782 Laying down ecodesign requirements for external power supplies pursuant to Directive 2009/125/EC of the European Parliament EN 50563:2011+A1:2013 External a.c. - d.c. and a.c. - a.c. power supplies – Determination of no-load power and average efficiency of active modes
Date of Receipt sample	:	2025-06-04
Date of Test	:	2025-06-04 to 2025-06-12
Date of Issue	:	2025-06-13
Test Report Form No.	:	WPA-20191782A-01A
Test Result	:	**See following pages**

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

Prepared By:
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Tested by: Finn Yu

Approved by: Jerry Mu

Energy Test Instruction for no-load condition electric power consumption and average active efficiency of external power supplies

Definitions:

EUT – equipment under test;

Nameplate output power (P_O) – the maximum output power as specified by the manufacturer;

No-load condition – the condition in which the input of an external power supply is connected to the mains power source, but the output is not connected to any primary load;

Active mode – a condition in which the input of an external power supply is connected to the mains power source and the output is connected to a load;

Active mode efficiency – the ratio of the power produced by an external power supply in active mode, to the input power required to produce it;

Average active efficiency – the average of the active mode efficiencies at 25%, 50%, 75% and 100% of the nameplate output power.

General conditions for measurements:

Test condition parameter:	
Air speed close to the EUT	≤0.5m/s
Ambient temperature	23°C±5°C
Humidity	60%RH
Test voltage and frequency	115V±1%/60Hz±1% and 230V±1%/50Hz±1%
Total harmonic content of the test current at the EUT	≤0.1% (up to and including the 50th harmonic)
Crest factor of test voltage	1.34 – 1.49
Power measurement accuracy	0.022%
Resolution of power meter	0.01W

Remark:

Use of uncertainty of measurement for decisions on conformity (decision rule):
No decision rule is specified by the 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”).

When determining for test conclusion, measurement uncertainty of tests has been considered, see above table.

The equipment is set to root mean square (r.m.s.) mode.

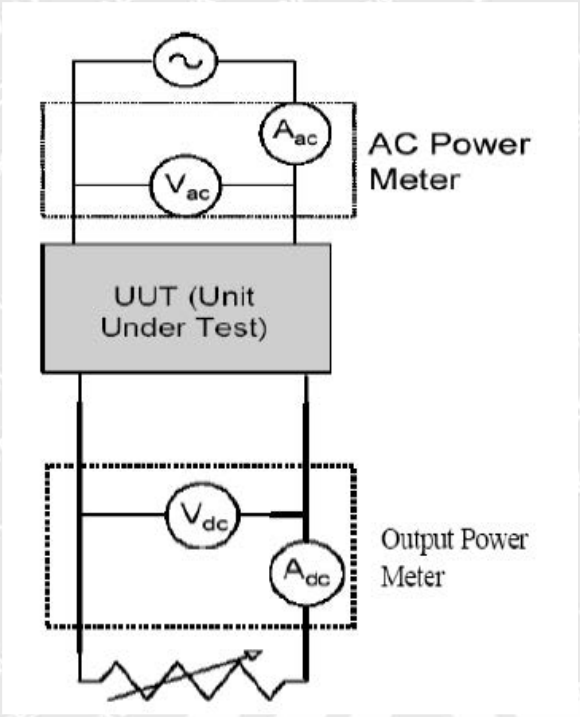
All ‘verdicts’ in this test report based on test voltage as 230V, 50Hz, other test voltages were not considered according to client’s requirement.

Preparation of EUT & Measuring equipment

EUT preparation:

The EUT shall be operated at 100% of nameplate current output for at least 30 minutes immediately prior to conducting efficiency measurements.

Measuring equipment preparation:



Procedure:

Monitor ac input power for a period of 5 minutes to assess the stability of the EUT. If the power level does not drift by more than 5% from the maximum value observed, the EUT can be considered stable and the measurements can be recorded at the end of the 5 minute period. Subsequent load conditions (see below) can then be measured under the same 5 minute stability guidelines.

If ac input power is not stable over a 5 minute period, connect the EUT to the metering equipment and select the mode to be measured. Monitor the power. Average power is determined using either the average power or accumulated energy approaches outlined below.

a) Average power approach: where the power meter can record a true average power over a user selected period, the period selected shall not be less than 5 min (except if there is an operating cycle – see below).

b) Accumulated energy approach: where the power meter can accumulate energy over a user selected period, the period selected shall not be less than 5 min (except if there is an operating cycle – see below). The integrating period shall be such that the total recorded value for energy and time is more than 200 times the resolution of the meter for energy and time. Determine the average power by dividing the accumulated energy by the time for the monitoring period.

If the power varies over a cycle (i.e. a regular sequence of power states that occur over several minutes or hours), the period selected to average power or accumulate energy shall be one or more complete cycles in order to get a representative average value.

Efficiency measurements shall be conducted in sequence from Load Condition 1 to Load Condition 6 as indicated in follow table.

Percentage of Nameplate Output Current	
Load Condition 1	100%±2%
Load Condition 2	75%±2%
Load Condition 3	50%±2%
Load Condition 4	25%±2%
Load Condition 5	10%±1%
Load Condition 6	0%

Product Information:

Model:	MO2702
Product Powered (if known):	Unknown
Integral Input Power Switch	Not Present
Input Cord Length (cm)	Not Present
Output Cord Length (cm)	Not Present

Nameplate Specifications	Input (AC)	Output (DC)
Voltage (V)	100-240	5
Current (mA)	Not Stated	1000
Power (W)	Not Stated	5
Frequency (Hz)	50/60	Not Present

Possible test case verdicts:

- test case does not apply to the test object: ……: N(/A) (Not applicable)
- test object does meet the requirement……: P (Pass)
- test object does not meet the requirement: ……: F (Fail)

COMMISSION REGULATION (EU) 2019/1782				
Annex II Ecodesign requirements for external power supplies				
Clause	Requirement + Test		Result – Remark	Verdict
1.	**Energy efficiency requirements:**			
(a)	From 1 April 2020, the no-load condition power consumption shall not exceed the following values:			P
	AC-AC external power supplies, except low voltage and multiple voltage output external power supplies			N
	0.21 W			N
	AC-DC external power supplies, except low voltage and multiple voltage output external power supplies			P
	$P_O \leq 49.0$ W	0.10 W		N
	$P_O > 49.0$ W	0.21 W		N
	Low voltage external power supplies			N
	$P_O \leq 49.0$ W	0.10 W	0.04 W (115V), 0.07 W (230V).	P
	$P_O > 49.0$ W	0.21 W		N
	Multiple voltage output external power supplies			N
	0.30 W			N
(b)	From 1 April 2020, the average active efficiency shall be not less than the following values:			P
	AC-AC external power supplies, except low voltage and multiple voltage output external power supplies			N
	or AC-DC external power supplies, except low voltage and multiple voltage output external power supplies			P
	$P_O \leq 1.0$ W	$0.5 \times P_O/1W + 0.160$		N
	$1 W < P_O \leq 49.0$ W	$0.071 \times \ln(P_O/1W) - 0.0014 \times P_O/1W + 0.67$		N
	$P_O > 49.0$ W	0.880		N
	Low voltage external power supplies			N
	$P_O \leq 1.0$ W	$0.517 \times P_O/1W + 0.087$		N
	$1 W < P_O \leq 49.0$ W	$0.0834 \times \ln(P_O/1W) - 0.0014 \times Po/1W + 0.609$	Average active efficiency: 76.73% (115V), 74.35% (230V). Limit: 73.62%	P
	$P_O > 49.0$ W	0.870		N
	Multiple voltage output external power supplies			N
	$P_O \leq 1.0$ W	$0.497 \times P_O/1W + 0.067$		N
	$1 W < P_O \leq 49.0$ W	$0.075 \times \ln(P_O/ 1W) + 0.561$		N
	$P_O > 49.0$ W	0.860		N
2.	**Information requirements:**			

COMMISSION REGULATION (EU) 2019/1782					
Annex II Ecodesign requirements for external power supplies					
Clause	Requirement + Test			Result – Remark	Verdict
(a)	from 1 April 2020, the nameplate shall include the following information:				P
	Nameplate information	Value and precision	Unit	5.0V, 1.0A, 5.0W	P
	Output power	X.X	W		
	Output voltage	X.X	V		
	Output current	X.X	A		
	Notes: In cases where more than one physical output or more than one output voltage at load condition 1 are measured, the sets of available Output voltage — Output current – Output power shall be given.				N
(b)	From 1 April 2020, instruction manuals for end-users (where applicable), and free access websites of manufacturers, importers or authorised representatives shall include the information of attachment 1, in the order as set out:			See attachment 1	P
	The relevant load conditions are as follows:				P
	Percentage of nameplate output current				P
	Load condition 1	100 % ± 2 %			
	Load condition 2	75 % ± 2 %			
	Load condition 3	50 % ± 2 %			
	Load condition 4	25 % ± 2 %			
	Load condition 5	10 % ± 1 %			
	Load condition 6	0 % (no-load condition)			
(c)	From 1 April 2020, the technical documentation for the purposes of conformity assessment pursuant to Article 4 shall contain the following elements:				P
(1)	For external power supplies with a nameplate output power greater than 10 watts:				N
	In cases where more than one physical output or more than one output voltage at load condition 1 are measured, the relevant reported quantities shall be specified for each measurement.				N
(2)	for external power supplies with a nameplate output power of 10 watts or less:				P
	In cases where more than one physical output or more than one output voltage at load condition 1 are measured, the relevant reported quantities shall be specified for each measurement.				N
3.	**Measurements and calculations**				
	For the purposes of compliance and verification of compliance with the requirements of this Regulation,			EN 50563: 2011+ A1: 2013	P

COMMISSION REGULATION (EU) 2019/1782			
Annex II Ecodesign requirements for external power supplies			
Clause	Requirement + Test	Result – Remark	Verdict
	measurements and calculations shall be made using harmonised standards the reference numbers of which have been published for this purpose in the Official Journal of the European Union, or other reliable, accurate and reproducible methods, which take into account the generally recognised state of the art.	Test Method for Calculating the Energy Efficiency of Single Voltage External Ac-Dc and Ac-Ac Power Supplies (August 13, 2004)	

Appendix-Test Data Sheet

Test Result:

Test item	Tested at 115V, 60Hz	Tested at 230V, 50Hz	Efficiency requirements
No load power (W)	0.043	0.068	≤ 0.100
Efficiency of 10% full load (%)	73.47%	66.79%	---
Average efficiency (%)	76.73%	74.35%	≥ 73.62%
Complies with performance mark	COMMISSION REGULATION (EU) 2019/1782		

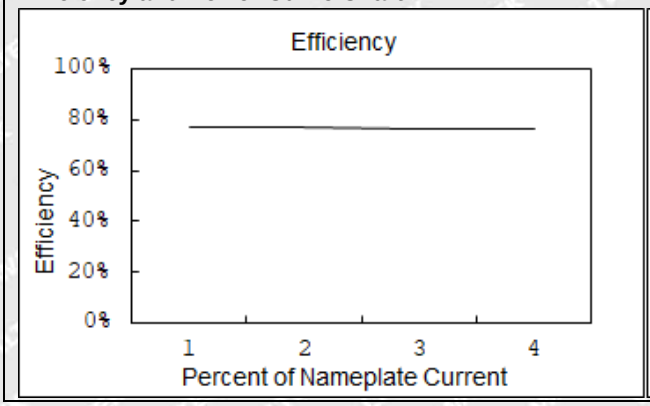
Measurement and calculation:

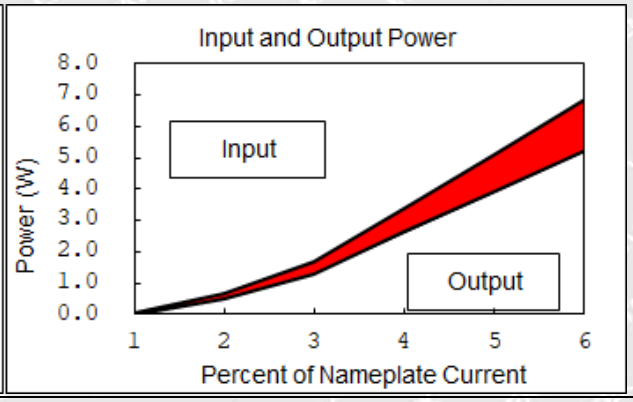
Input Voltage, Frequency	115VAC, 60Hz					
Reported Quantity	**Description**					
Load condition	6	5	4	3	2	1
	0%	10 % ± 1 %	25 % ± 2 %	50 % ± 2 %	75 % ± 2 %	100 % ± 2 %
Output current (mA)	0	100	250	500	750	1000
Output voltage (V)	5.134	5.145	5.183	5.235	5.247	5.226
Active output power (W)	0.000	0.515	1.296	2.618	3.935	5.226
Input power (W)	0.043	0.700	1.683	3.400	5.127	6.858
Total harmonic distortion THDi (%)	404.12%	246.58%	204.53%	164.60%	142.21%	127.73%
True power factor	0.2218	0.3725	0.4313	0.5000	0.5420	0.5696
Power consumed (W)	0.043	0.186	0.387	0.783	1.192	1.632
Active mode efficiency	---	73.47%	76.99%	76.99%	76.76%	76.20%
Average active efficiency	---	---	76.73%			

Calculation information:

True Power Factor = Input Power / (Input Voltage * Input current)
Power consumed = Input Power - Active Output Power
Efficiency = Active Output Power / Input Power
Average Efficiency = (Efficiency 1 + Efficiency 2 + Efficiency 3 + Efficiency 4) / 4
No Load Power consumption = Load condition at 0% load

Efficiency and Power Curve Chart:



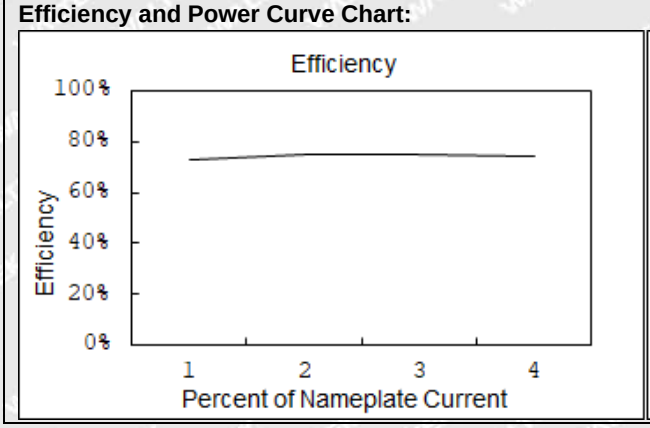


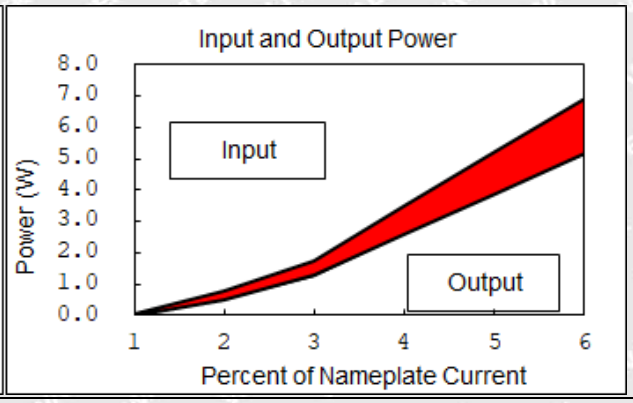
Input Voltage, Frequency	230VAC, 50Hz					
Reported Quantity	**Description**					
Load condition	6	5	4	3	2	1
	0%	10 % ± 1 %	25 % ± 2 %	50 % ± 2 %	75 % ± 2 %	100 % ± 2 %
Output current (mA)	0	100	250	500	750	1000
Output voltage (V)	5.131	5.116	5.154	5.187	5.192	5.152
Active output power (W)	0.000	0.512	1.289	2.594	3.894	5.152
Input power (W)	0.068	0.766	1.760	3.462	5.204	6.921
Total harmonic distortion THDi (%)	464.32%	302.10%	279.59%	247.41%	227.56%	206.33%
True power factor	0.1894	0.3119	0.3350	0.3704	0.3959	0.4264
Power consumed (W)	0.068	0.254	0.472	0.869	1.310	1.769
Active mode efficiency	---	66.79%	73.21%	74.91%	74.83%	74.44%
Average active efficiency	---	---	74.35%			

Calculation information:

True Power Factor = Input Power / (Input Voltage * Input current)
Power consumed = Input Power - Active Output Power
Efficiency = Active Output Power / Input Power
Average Efficiency = (Efficiency 1 + Efficiency 2 + Efficiency 3 + Efficiency 4) / 4
No Load Power consumption = Load condition at 0% load

Efficiency and Power Curve Chart:





Attachment 1: Information in instruction manuals for end-users (where applicable), and free access websites

The user manual also can be accessed via internet: N/A

Information published	Value and precision	Unit	Notes
Manufacturer's name or trade mark, commercial registration number and address	N/A		
Model identifier	MO2702		
Input voltage	100-240	V	Specified by the manufacturer. Shall be a value or a range.
Input AC frequency	50/60	Hz	Specified by the manufacturer. Shall be a value or a range.
Output voltage	5.0	V	Nameplate output voltage. Shall indicate whether is AC or DC. In cases where more than one physical output or more than one output voltage at load condition 1 are measured, the sets of available Output voltage — Output current – Output power shall be published.
Output current	1.0	A	Nameplate output current. In cases where more than one physical output or more than one output voltage at load condition 1 are measured, the sets of available Output voltage — Output current – Output power shall be published.
Output power	5.0	W	Nameplate output power. In cases where more than one physical output or more than one output voltage at load condition 1 are measured, the sets of available Output voltage — Output current – Output power shall be published.
Average active efficiency	74.4	%	Declared by the manufacturer based on the value calculated as arithmetical mean of efficiency at load conditions 1-4. In cases where multiple average active efficiencies are declared for multiple output voltages available at load condition 1, the value published shall be the average active efficiency declared for the lowest output voltage.
Efficiency at low load (10 %)	66.8	%	Declared by the manufacturer based on the value calculated at load condition 5. External power supplies with a nameplate output power of 10 W or less shall be exempted from this requirement. In cases where multiple average active efficiencies are declared for multiple output voltages available at load condition 1, the value published shall be the value declared for the lowest output voltage.
No-load power consumption	0.07	W	Declared by the manufacturer based on the value measured for load condition 6.

Attachment 1: Equipment List

Equipment	Model/Type	Internal ID	Cal. Due. Date
Temperature & Humidity Datalogger	Testo 608-H1	WTFN1009A1-002	2026-01-06
AC power source	Ainuo AN60002H	WTFN1005A1-005	2026-01-06
Digital power meter	EVERFINE PF2010A	WTFN1004A1-002	2026-01-06
Digital power meter	YOKOGAWA WT310E	WTFL1003A1-003	2026-01-06
DC Electronic Load	ITECH IT8513B	WTFN1025A1-001	2026-01-06

Attachment 2: Photo document

Model: MO2702

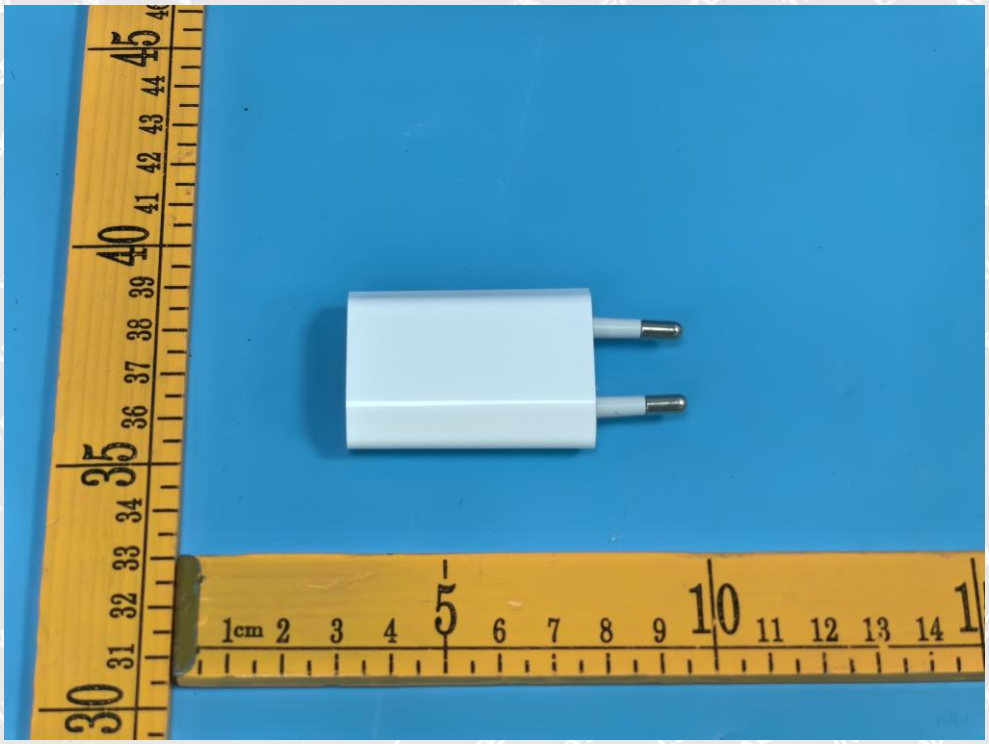


Photo 1

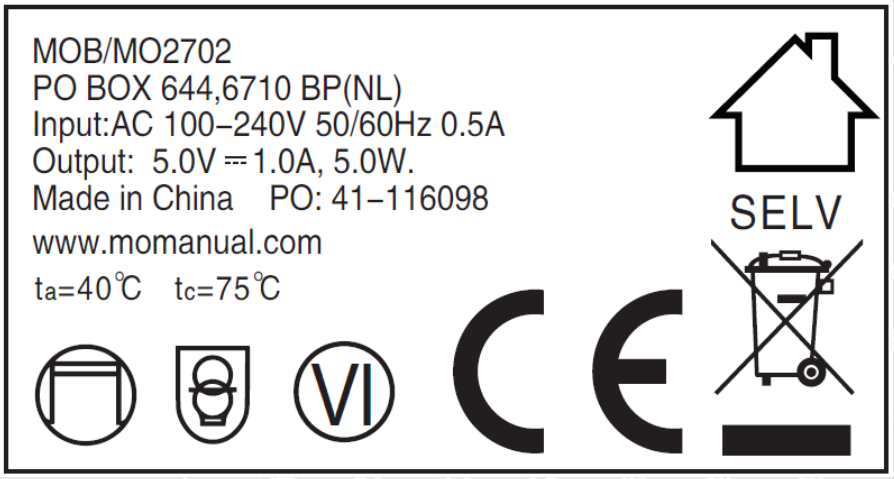


Photo 2

====== End of Report ======