



TEST REPORT

Reference No...... : WTA25F12347158L
Applicant..... : ONOK LIGHTING, SL
Address..... : Pol. Ind. 3 Parcela B 46800 Xàtiva (Valencia) SPAIN
Manufacturer : The same as above
Address..... : The same as above
Product Name..... : LED Fixed luminaires
Model No...... : See model list on page 3
Test specification..... : Luminaires
Part 2-1: Fixed general purpose luminaires
IEC 60598-2-1:2020
IEC 60598-1:2020
Date of Receipt sample : 2026-01-16
Date of Test : 2026-01-17 to 2026-01-27
Date of Issue..... : 2026-01-28
Test Report Form No...... : WSL-60598211-01B
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:

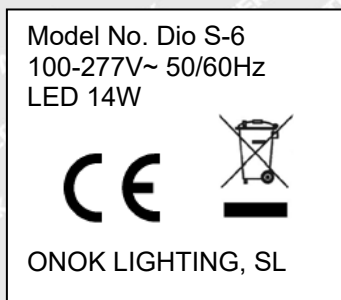
Richard Chan

Approved by:

Jerry Mu



Test item description.....	: Fixed luminaire
Trade Mark.....	: --
Model/Type reference.....	: See model list on page 3
Ratings.....	: See model list on page 3

Copy of marking plate:

On the luminaire surface

Note:

The height of graphical symbols shall not be less than 5 mm.

The height of letters and numerals either shown separately or with or as part of symbols shall not be less than 2 mm.

Remark: The marking labels for the other model is identical as above, expect the model No. and some parameters.

Summary of testing:

1. Unless otherwise specified, the model Dio S-6, Serra 10W were chosen as representative model to perform all tests, and the tests results complied with the requirements of the standards mentioned in page one.
2. EN deviation to IEC 60598-1:2020 and IEC 60598-2-1:2020 were considered and found to comply with the requirement.
3. Integral LED module was assessed according to EN IEC 62031:2020+A11:2021 and found to comply with the requirement.
4. Retinal blue light hazard was assessed according to IEC/TR 62778:2014, lamp classification group: RG1 unlimited.
5. 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.
6. Only the most unfavorable results are recorded in this report.

**Test items particulars:**

Classification of installation and use.....: Fixed luminaires
 Supply Connection.....: Connecting lead (tail)

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:

1. Fixed general purpose luminaires, for indoor use only.
2. All models have the same construction, except for driver and appearance.
3. 100-277VAC, 50/60Hz, other detail see below model list:

Model list

Model	Rated power input (W)	Protection Class	Driver	Different
Dio S-3	LED 7W	Class I	TITI-GP0310F02-700	LED
Dio S-6	LED 14W	Class I	TITI-GP0715F05-700	
Serra 10W	LED 10W	Class I	TITI-GP0310F02-200	COB



IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.4 (0)	GENERAL TEST REQUIREMENTS		P
1.4 (0.3)	More sections applicable.....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
1.4 (0.5)	Components	(see Annex 1)	—
1.4 (0.7)	Information for luminaire design in light sources standards		—
1.4 (0.7.2)	Light source safety standard	EN IEC 62031	—
	Luminaire design in the light source safety standard		P

1.5 (2)	CLASSIFICATION		P
1.5 (2.2)	Type of protection	Class I	—
1.5 (2.3)	Degree of protection.....	IP20	—
1.5 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
1.5 (2.5)	Luminaire for normal use	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Luminaire for rough service	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
1.6 (3)	MARKING		P
1.6 (3.2)	Mandatory markings	See "Copy of marking plate"	P
	Position of the marking	On the luminaries surface	P
	Format of symbols/text		P
1.6 (3.3)	Additional information		P
	Language of instructions	English	P
1.6 (3.3.1)	Combination luminaires		N
1.6 (3.3.2)	Nominal frequency in Hz	50/60Hz	P
1.6 (3.3.3)	Operating temperature		N
1.6 (3.3.5)	Wiring diagram		N
1.6 (3.3.6)	Special conditions		N
1.6 (3.3.7)	Metal halide lamp luminaire – warning		N
1.6 (3.3.8)	Limitation for semi-luminaires		N
1.6 (3.3.9)	Power factor and supply current		N
1.6 (3.3.10)	Suitability for use indoors		N
1.6 (3.3.11)	Luminaires with remote control		N
1.6 (3.3.12)	Clip-mounted luminaire – warning		N
1.6 (3.3.13)	Specifications of protective shields		N
1.6 (3.3.14)	Symbol for nature of supply	~	P
1.6 (3.3.15)	Rated current of socket outlet		N
1.6 (3.3.16)	Rough service luminaire		N



IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments		N
1.6 (3.3.18)	Non-ordinary luminaires with PVC cable		N
1.6 (3.3.19)	Protective conductor current in instruction if applicable		N
1.6 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N
1.6 (3.3.21)	Non-replaceable and non-user replaceable light sources information provided	Non-user replaceable light	P
1.6 (3.3.22)	Controllable luminaires, classification of insulation provided		N
1.6 (3.3.23)	Luminaire without controlgear provided with necessary information for selection of appropriate component		N
1.6 (3.3.24)	If not supplied with terminal block, information on the packaging		P
1.6 (3.3.25)	Luminaires employing light sources emitting UV on mains wiring, information provided		N
1.6 (3.3.26)	Wall mounted luminaire using external flexible cable or cord longer than 0.3 m, information provided		N
1.6 (3.4)	Test with water	15s	P
	Test with hexane	15s	P
	Legible after test		P
	Label attached		P

1.7 (4)	CONSTRUCTION		P
1.7 (4.2)	Components replaceable without difficulty		N
1.7 (4.3)	Wireways smooth and free from sharp edges		P
1.7 (4.4)	Lampholders		N
1.7 (4.4.1)	Integral lampholder		N
1.7 (4.4.2)	Wiring connection		N
1.7 (4.4.3)	Lampholder for end-to-end mounting		N
1.7 (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)	--	—



IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	After test the lampholder have not moved from its position and show no permanent deformation		N
1.7 (4.4.5)	Peak pulse voltage		N
1.7 (4.4.6)	Centre contact		N
1.7 (4.4.7)	Parts in rough service luminaires resistant to tracking		N
1.7 (4.4.8)	Lamp connectors		N
1.7 (4.4.9)	Caps and bases correctly used		N
1.7 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N
1.7 (4.5)	Starter holders		N
	Starter holder in luminaires other than class II		N
	Starter holder class II construction		N
1.7 (4.6)	Terminal blocks		P
	Tails		P
	Unsecured blocks		N
1.7 (4.7)	Terminals and supply connections		P
1.7 (4.7.1)	Contact to metal parts		N
1.7 (4.7.2)	Test 8 mm live conductor		N
	Test 8 mm earth conductor		N
1.7 (4.7.3)	Terminals for supply conductors		N
1.7 (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
1.7 (4.7.4)	Terminals other than supply connection		N
1.7 (4.7.5)	Heat-resistant wiring/sleeves		N
1.7 (4.7.6)	Multi-pole plug		N
	- test at 30 N		N
1.7 (4.8)	Switches		N
	- adequate rating		N
	- adequate fixing		N
	- polarized supply		N



IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- compliance with IEC 61058-1 for electronic switches		N
1.7 (4.9)	Insulating lining and sleeves		P
1.7 (4.9.1)	Retainment		P
	Method of fixing	Heat shrinkable tube	—
1.7 (4.9.2)	Insulated linings and sleeves:		P
	Resistant to a temperature > 20 °C to the wire temperature or		P
	a) & c) Insulation resistance and electric strength		N
	b) Ageing test. Temperature (°C)	--	N
1.7 (4.10)	Double or reinforced insulation		P
1.7 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation	For Class II construction	P
	Safe installation fixed luminaires		P
	Capacitors and switches		N
	Interference suppression capacitors according to IEC 60384-14		N
1.7 (4.10.2)	Assembly gaps:		N
	- not coincidental		N
	- no straight access with test probe		N
1.7 (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
1.7 (4.10.4)	Protective impedance device		N
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor		N
	Y1 or Y2 capacitors comply with IEC 60384-14		N
	Resistors comply with test (a) in 14.1 of IEC 60065		N
1.7 (4.11)	Electrical connections and current-carrying parts		P
1.7 (4.11.1)	Contact pressure		P
1.7 (4.11.2)	Screws:		N
	- self-tapping screws		N
	- thread-cutting screws		N
1.7 (4.11.3)	Screw locking:		P
	- spring washer		P



IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- rivets		N
1.7 (4.11.4)	Material of current-carrying parts	Copper > 50%	P
1.7 (4.11.5)	No contact to wood or mounting surface		P
1.7 (4.11.6)	Electro-mechanical contact systems		N
1.7 (4.12)	Screws and connections (mechanical) and glands		P
1.7 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N
	Torque test: torque (Nm); part.....	Screw use for fixing earth wire: 0.5Nm	P
	Torque test: torque (Nm); part.....	Screw use for fixing wirerope: 0.5Nm	P
	Torque test: torque (Nm); part.....	Screw use for fixing COB cover: 0.5Nm	P
1.7 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N
1.7 (4.12.4)	Locked connections:		N
	- fixed arms; torque (Nm)	--	N
	- lampholder; torque (Nm)	--	N
	- push-button switches; torque 0,8 Nm	--	N
1.7 (4.12.5)	Screwed glands; force (Nm).....	--	N
1.7 (4.13)	Mechanical strength		P
1.7 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm)	--	N
	- other parts; energy (Nm).....	All enclosure: 0.35 Nm	P
	1) live parts		P
	2) linings		P
	3) protection		P
	4) covers		P
1.7 (4.13.2)	Metal parts have adequate mechanical strength		P
1.7 (4.13.3)	Straight test finger	All enclosure: 30 N	P
1.7 (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
1.7 (4.13.6)	Tumbling barrel		N
1.7 (4.14)	Suspensions, fixings and means of adjusting		P



IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7 (4.14.1)	Mechanical load:		P
	A) four times the weight		P
	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
	Fixed luminaire or independent control gear without fixing devices		N
1.7 (4.14.2)	Load to flexible cables		N
	Mass (kg)	--	—
	Stress in conductors (N/mm ²)	--	N
	Mass (kg) of semi-luminaire	--	—
	Bending moment (Nm) of semi-luminaire	--	N
1.7 (4.14.3)	Adjusting devices:		N
	- flexing test; number of cycles.....	--	N
	- strands broken	--	N
	- electric strength test afterwards		N
1.7 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N
1.7 (4.14.5)	Guide pulleys Closed-end connector		N
1.7 (4.14.6)	Strain on socket-outlets		N
1.7 (4.15)	Flammable materials		P
	- glow-wire test 650°C	See Test Table 1.16 (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
1.7 (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
1.7 (4.16)	Luminaires for mounting on normally flammable surfaces		P
	No lamp control gear	(compliance with Section 12)	P



IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Provided with adaptor for a track meet the requirements for direct mounting on normally flammable surfaces		N
1.7 (4.16.1)	Lamp control gear spacing:		N
	- spacing 35 mm		N
	- spacing 10 mm		N
1.7 (4.16.2)	Thermal protection:		N
	- in lamp control gear		N
	- external		N
	- fixed position		N
	- temperature marked lamp control gear		N
1.7 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N
1.7 (4.17)	Drain holes		N
	Clearance at least 5 mm		N
1.7 (4.18)	Resistance to corrosion		N
1.7 (4.18.1)	- rust-resistance		N
1.7 (4.18.2)	- season cracking in copper		N
1.7 (4.18.3)	- corrosion of aluminium		N
1.7 (4.19)	Igniters compatible with ballast		N
1.7 (4.20)	Rough service vibration		N
1.7 (4.21)	Protective shield		N
1.7 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N
	Shield of glass if tungsten halogen lamps		N
1.7 (4.21.2)	Particles from a shattering lamp not impair safety		N
1.7 (4.21.3)	No direct path		N
1.7 (4.21.4)	Impact test on shield		N
	Glow-wire test on lamp compartment.....	See Test Table 1.15 (13.3.2)	N
1.7 (4.22)	Attachments to lamps not cause overheating or damage		N
1.7 (4.23)	Semi-luminaires comply Class II		N
1.7 (4.24)	Photobiological hazards		P
1.7 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N
1.7 (4.24.2)	Retinal blue light hazard		P
	Class of risk group assessed according to IEC/TR 62778	RG1 unlimited	P
	Luminaires with E_{thr} :		N



IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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
	- 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
1.7 (4.25)	Mechanical hazard		P
	No sharp point or edges		P
1.7 (4.26)	Short-circuit protection		N
1.7 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N
1.7 (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
1.7 (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
1.7 (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
1.7 (4.29)	Luminaires with non-replaceable light source		N
	Not possible to replace light source		N



IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Live part not accessible after parts have been opened by hand or tools		N
1.7 (4.30)	Luminaires with non-user replaceable light source		P
	If protective cover provide protection against electric shock and marked with "caution, electric shock risk" symbol:		N
	At least one fixing means requiring use of tool	SELV Max.50VDC	N
1.7 (4.31)	Insulation between circuits		P
	Circuits insulated from LV supply fulfill requirements according 4.31.1 – 4.31.3		P
	Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfill requirements according 4.31.1 – 4.31.3		N
1.7 (4.31.1)	SELV or PELV circuits		P
	Used SELV/PELV source		P
	Voltage ≤ ELV		P
	Insulating of SELV/PELV circuits from LV supply		P
	Insulating of SELV/PELV circuits from other non SELV/PELV circuits		N
	Insulating of SELV/PELV circuits from FELV		N
	Insulating of SELV/PELV circuits from other SELV/PELV circuits		N
	SELV/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
1.7 (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 enter socket-outlets of other voltage systems		N
	Socket outlets does not admit plugs of other voltage systems		N
	Socket-outlets does not have protective conductor contact		N



IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7 (4.31.3)	Other circuits		P
	Other circuits insulated from accessible parts according Table X.1		P
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		N
	- conductive parts are connected together		N
	- test according 7.2.3 of above		N
	- conductive part 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
1.7 (4.32)	Overvoltage protective devices		N
	Comply with IEC 61643-11		N
	External to control gear and connected to earth:		N
	- only in fixed luminaires		N
	- only connected to protective earth		N
1.7 (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
1.7 (4.34)	Electromagnetic fields (EMF)		P
	No harmful electromagnetic fields		P
1.7 (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
1.7 (4.36)	Track-mounted luminaires		N
	Test in accordance with Annex A of IEC60570:2003/AMD2:2019		N



IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.8 (11.2)	CREEPAGE DISTANCES AND CLEARANCES		P
1.8 (11.2.1)	Impulse withstand category (Normal category II)	Category II <input checked="" type="checkbox"/> Category III <input type="checkbox"/>	—
	Category III according Annex U		N
	Protected against pollution, reduced creepage and clearance according Annex P of IEC 61347-1		N
1.8 (11.2.2)	Creepage distances for frequency up to 30 kHz	See Test Table 1.8 (11.2) I	P
	Creepage distances for frequency over 30 kHz:		N
	- Controlgear marked with \hat{U}_{OUT} and f_{JOUT} according IEC 61347-1, clause 7.1, item w	See Test Table 1.8 (11.2) II	N
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 1.8 (11.2) II	N
1.8 (11.2.3)	Clearances for frequency up to 30 kHz	See Test Table 1.8 (11.2) I	P
	Clearances distances for frequency over 30 kHz:		N
	- Controlgear marked with U_p	See Test Table 1.8 (11.2) II	N
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 1.8 (11.2) II	N
1.9 (7)	PROVISION FOR EARTHING		P
1.9 (7.2.1 + 7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		P
	Resistance < 0,5 Ω	0.022 Ω	P
	Self-tapping screws used		N
	Thread-forming screws		N
	Thread-forming screw used in a grove		N
	Earth makes contact first		P
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N
	Protective earthing of the luminaire not via built-in control gear		P
1.9 (7.2.2 + 7.2.3)	Earth continuity in joints, etc.		P
1.9 (7.2.4)	Locking of clamping means		P
	Compliance with 4.7.3		P
1.9 (7.2.5)	Earth terminal integral part of connector socket		N
1.9 (7.2.6)	Earth terminal adjacent to mains terminals		P
1.9 (7.2.7)	Electrolytic corrosion of the earth terminal		P
1.9 (7.2.8)	Material of earth terminal		P
	Contact surface bare metal		P



IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.9 (7.2.10)	Class II luminaire for looping-in		N
	Double or reinforced insulation to functional earth		N
1.9 (7.2.11)	Earthing core coloured green-yellow		P
	Length of earth conductor		N
1.9 (7.2.12)	PELV circuit connected to protective earth for functional purpose		N
1.10 (14)	SCREW TERMINALS		N
	Separately approved; component list.....	(see Annex 1)	N
	Part of the luminaire	(see Annex 3)	N
1.10 (15)	SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS		N
	Separately approved; component list.....	(see Annex 1)	N
	Part of the luminaire	(see Annex 4)	N
1.11 (5)	EXTERNAL AND INTERNAL WIRING		P
1.11 (5.2)	Supply connection and external wiring		P
1.11 (5.2.1)	Means of connection	Connecting lead (tail)	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
1.11 (5.2.2)	Type of cable	(see Annex 1)	N
	Nominal cross-sectional area (mm ²)	(see Annex 1)	N
	Cables equal to IEC 60227 or IEC 60245		N
1.11 (5.2.3)	Type of attachment, X, Y or Z		N
1.11 (5.2.5)	Type Z not connected to screws		N
1.11 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
1.11 (5.2.7)	Cable entries through rigid material have rounded edges		N
1.11 (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
1.11 (5.2.9)	Locking of screwed bushings		N



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Clause	Requirement + Test	Result - Remark	Verdict
1.11 (5.2.10)	Cord anchorage:		N
	- covering protected from abrasion		N
	- clear how to be effective		N
	- no mechanical or thermal stress		N
	- no tying of cables into knots etc.		N
	- insulating material or lining		N
1.11 (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
1.11 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		N
1.11 (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
1.11 (5.2.10.4)	Luminaire with/designed for use with supply cord with maximum current of 2A:		N
	- Ordinary Class III luminaire supplied with SELV ≤ 25 V RMS/60V DC		N
	- Ordinary Class III luminaire supplied with PELV ≤ 12 V RMS/30V DC		N
	- Other than ordinary Class III luminaire supplied with voltage ≤ 12 V RMS/30V DC		N
	Pull test of 30N for 1min		N
1.11 (5.2.11)	External wiring passing into luminaire		N



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Clause	Requirement + Test	Result - Remark	Verdict
1.11 (5.2.12)	Looping-in terminals		N
1.11 (5.2.13)	Wire ends not tinned		N
	Wire ends tinned: no cold flow		N
1.11 (5.2.14)	Mains plug same protection		N
	Class III luminaire plug		N
	No unsafe compatibility		N
1.11 (5.2.15)	Connectors for Class III luminaires (IEC 60603 or IEC 62680)		N
1.11 (5.2.16)	Appliance inlets (IEC 60320)		N
	Installation couplers (IEC 61535)		N
	Other appliance inlet or connector according relevant IEC standard		N
1.11 (5.2.17)	No standardized interconnecting cables properly assembled		N
1.11 (5.2.18)	Used plug in accordance with		N
	- IEC 60083		N
	- other standard		N
1.11 (5.3)	Internal wiring		P
1.11 (5.3.1)	Internal wiring of suitable size and type	(see Annex 1)	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 earth only		P
1.11 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P
	Cross-sectional area (mm ²).....	(see Annex 1)	P
	Insulation thickness		N
	Extra insulation added where necessary		N
1.11 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		P
	Cross-sectional area (mm ²).....	See Annex 1	P
1.11 (5.3.1.3)	Double or reinforced insulation for class II	For Class II construction	P
1.11 (5.3.1.4)	Conductors without insulation		N
1.11 (5.3.1.5)	SELV/PELV current-carrying parts		P
1.11 (5.3.1.6)	Insulation thickness other than PVC or rubber		N
1.11 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N



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Clause	Requirement + Test	Result - Remark	Verdict
	Joints, raising/lowering devices		N
	Telescopic tubes etc.		N
	No twisting over 360°		P
1.11 (5.3.3)	Insulating bushings:		P
	- suitable fixed		P
	- material in bushings		P
	- material not likely to deteriorate		P
	- cables with protective sheath		P
1.11 (5.3.4)	Joints and junctions effectively insulated		N
1.11 (5.3.5)	Strain on internal wiring		N
1.11 (5.3.6)	Wire carriers		N
1.11 (5.3.7)	Wire ends not tinned		N
	Wire ends tinned: no cold flow		P
1.11 (5.4)	Test to determine suitability of conductors having a reduced cross-sectional area		P
	Under test the temperature of the luminaire wiring insulation not exceed the limits stated in Table 12.2	(see Annex 2)	P
	No damage to luminaire wiring after test		P

1.12 (8)	PROTECTION AGAINST ELECTRIC SHOCK		P
1.12 (8.2.1)	Live parts not accessible		P
	Basic insulated parts not used on the outer surface without appropriate protection		P
	Basic insulated parts not accessible with standard test finger on portable, settable and adjustable luminaires		N
	Basic insulated parts not accessible with Ø 50 mm probe from outside, within arms reach, on wall-mounted luminaires		P
	Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements		N
	Basic insulation only accessible under lamp or starter replacement		N
	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



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Clause	Requirement + Test	Result - Remark	Verdict
1.12 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N
1.12 (8.2.3.a)	Class II luminaire:		N
	- basic insulated metal parts not accessible during starter or lamp replacement		N
	- basic insulation not accessible other than during starter or lamp replacement		N
	- glass protective shields not used as supplementary insulation		N
1.12 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N
1.12 (8.2.3.c)	SELV 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
	- interrupted DC voltage (V)		N
	- touch current if applicable (mA)		N
	One conductive part insulated if required		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
	Class III luminaire only for connection to SELV		N
	Class III luminaire not provided with means for protective earthing		N
1.12 (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
	One pole insulated if required		N
1.12 (8.2.4)	Portable luminaire have protection independent of supporting surface		N
1.12 (8.2.5)	Compliance with the standard test finger or relevant probe		P
1.12 (8.2.6)	Covers reliably secured		P



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Clause	Requirement + Test	Result - Remark	Verdict
1.12 (8.2.7)	Luminaire other than below with capacitor > 0,5 μ F not exceed 50 V 1 min after disconnection		P
	Portable luminaire with capacitor > 0,1 μ F (0.25) not exceed 34 V 1 s after disconnection		N
	Other luminaires with capacitor > 0,1 μ F (0.25) with plug and track adaptors not exceed 60 V 5 s after disconnection		N
1.13 (12)	ENDURANCE TEST AND THERMAL TEST		P
1.13 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 1.13		N
1.13 (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)	—
1.13 (12.3)	Endurance test:		P
	a) mounting-position	Acc. user manual	—
	b) test temperature ($^{\circ}$ C)	35 $^{\circ}$ C	—
	c) total duration (h)	240h	—
	d) supply voltage (V)	264V	—
	d) if not equipped with controlgear, constant voltage/current (V) or (A)	--	—
	e) luminaire ceases to operate		—
1.13 (12.3.1d)	d) Class III luminaires powered via information technology communication cable:		N
	- voltage under normal operation (V)		—
	- voltage under abnormal operation (V)		—
	e) luminaire ceases to operate		—
	f) luminaire with constant light output function		N
1.13 (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
1.13 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
1.13 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	N
1.13 (12.6)	Thermal test (failed lamp control gear condition):		N



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Clause	Requirement + Test	Result - Remark	Verdict
1.13 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A)	--	—
	- case of abnormal conditions.....	--	—
	- electronic lamp control gear		N
	- measured winding temperature (°C): at 1,1 Un	--	—
	- measured mounting surface temperature (°C) at 1,1 Un	--	N
	- calculated mounting surface temperature (°C)	--	N
	- track-mounted luminaires		N
1.13 (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
1.13 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N
1.13 (12.7.1)	Luminaire without temperature sensing control		N
1.13 (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 Table 1.15 (13.2.1)	N
1.13 (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.....	--	—



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Clause	Requirement + Test	Result - Remark	Verdict
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un.....	--	—
	- calculated temperature of fixing point/exposed part (°C)	--	—
	Ball-pressure test.....	See Table 1.15 (13.2.1)	N
1.13 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N
	- case of abnormal conditions.....	--	—
	- Components retained in place after the test		N
	- Test with standard test finger after the test		N
1.13 (12.7.2)	Luminaire with temperature sensing control		N
	- thermal link	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- manual reset cut-out.....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- auto reset cut-out.....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- case of abnormal conditions.....	--	—
	- highest measured temperature of fixing point/exposed part (°C):.....	--	—
	Ball-pressure test:	See Table 1.15 (13.2.1)	N

1.14 (9)	RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE		P
1.14 (-)	If IP > IP 20 the order of tests as specified in clause 1.12		N
1.14 (9.2)	Tests for ingress of dust, solid objects and moisture:		—
	- classification according to IP	IP20	—
	- mounting position during test.....	Acc. to user manual	—
	- 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



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Clause	Requirement + Test	Result - Remark	Verdict
	e) no entry into enclosure (IP 3X and IP 4X)		N
	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
1.14 (9.3)	Humidity test 48 h	25°C, 93%RH	P
1.15 (10)	INSULATION RESISTANCE AND ELECTRIC STRENGTH		P
1.15 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø	--	—
	Insulation resistance (MΩ).....	--	—
	SELV/PELV:		P
	- between current-carrying parts of different polarity	--	N
	- 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	--	N
	- Insulation bushings as described in Section 5	--	N
	Other than SELV/PELV:		P
	- between live parts of different polarity	100MΩ	P
	- between live parts and mounting surface	100MΩ	P
	- between live parts and metal parts.....	100MΩ	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
1.15 (10.2.2)	Electric strength test		P
	Dummy lamp		N
	Luminaires with ignitors after 24 h test		N
	Luminaires with manual ignitors		N
	Test voltage (V).....	--	N
	SELV/PELV:		N



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Clause	Requirement + Test	Result - Remark	Verdict
	- between current-carrying parts of different polarity	--	N
	- between current-carrying parts and mounting surface	500V	P
	- between current-carrying parts and metal parts of the luminaire	500V	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts	--	N
	- Insulation bushings as described in Section 5	--	N
	Other than SELV/PELV:		P
	- between live parts of different polarity	1554V (U=277V)	P
	- between live parts and mounting surface	1554V, 3180V (For Class II construction) (U=277V)	P
	- between live parts and metal parts	1554V, 3180V (For Class II construction) (U=277V)	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
1.15 (10.3)	Touch current or protective conductor current (mA)	Protective conductor current: Max. 0.085mA Touch current (For Class II construction): Max. 0.093mA	P

1.16 (13)	RESISTANCE TO HEAT, FIRE AND TRACKING		P
1.16 (13.2.1)	Ball-pressure test	See Test Table 1.15 (13.2.1)	N
1.16 (13.3.1)	Needle-flame test (10 s)	See Test Table 1.15 (13.3.1)	N
1.16 (13.3.2)	Glow-wire test (650°C)	See Test Table 1.15 (13.3.2)	P
1.16 (13.4)	Proof tracking test (IEC 60112)	See Test Table 1.15 (13.4)	N



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Clause	Requirement + Test	Result - Remark	Verdict

1.8 (11.2)	TABLE: Creepage distances and clearances							P
	Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages							P
	Applicable part of IEC 60598-1 Table 11.1* and 11.2*							P
	Insulation type **	Measured clearance	Required		Measured creepage	Required		
			clearance	*Table		creepage	*Table	
Distance 1:	B	2.7	1.5	11.1B	2.7	2.77	11.1A	
Working voltage (V).....	Max. 277V~					—		
PTI.....	< 600 <input checked="" type="checkbox"/>					≥ 600 <input type="checkbox"/>		
Pulse voltage if applicable (kV)	--					—		
Supplementary information: Live parts of different polarity								
Distance 2:	B	2.8	1.5	11.1B	2.8	2.77	11.1A	
Working voltage (V).....	Max. 277V~					—		
PTI.....	< 600 <input checked="" type="checkbox"/>					≥ 600 <input type="checkbox"/>		
Pulse voltage if applicable (kV)	--					—		
Supplementary information: Live parts and mounting surface								
Distance 3:	B	2.7	1.5	11.1B	2.7	2.77	11.1A	
Working voltage (V).....	Max. 277V~					—		
PTI.....	< 600 <input checked="" type="checkbox"/>					≥ 600 <input type="checkbox"/>		
Pulse voltage if applicable (kV)	--					—		
Supplementary information: Live parts and metal parts								
Distance 4:	R	6.2	3.0	11.1B	6.2	5.54	11.1A	
Working voltage (V).....	Max. 277V~					—		
PTI.....	< 600 <input checked="" type="checkbox"/>					≥ 600 <input type="checkbox"/>		
Pulse voltage if applicable (kV)	--					—		
Supplementary information: : Current-carrying parts and accessible parts (Class II construction)								

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



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Clause	Requirement + Test	Result - Remark	Verdict

1.8 (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 <input type="checkbox"/>	≥ 600 <input type="checkbox"/>	—
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 <input type="checkbox"/>	≥ 600 <input type="checkbox"/>	—
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 <input type="checkbox"/>	≥ 600 <input type="checkbox"/>	—
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
1.16 (13.2.1)	TABLE: Ball Pressure Test of Thermoplastics				N
Allowed impression diameter (mm)					≤2.0
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)		Impression diameter (mm)	
--	--	--		--	
--	--	--		--	
Supplementary information:					

1.16 (13.3.1)	TABLE: Needle-flame test (IEC 60695-11-5)				N
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
--	--	--	--	--	--
Supplementary information:					

1.16 (13.3.2)	TABLE: Glow-wire test (IEC 60695-2-11)				P
Glow wire temperature					650°C
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
Lens	See Annex 1	30	No	0	P
COB cover	See Annex 1	30	No	0	P
Reflector	See Annex 1	30	No	0	P
LED cover	See Annex 1	30	No	0	P
Lamp cover	See Annex 1	30	No	0	P
Any flame or glowing of the sample extinguished within 30 s of withdrawing the glow-wire, and any burning or molten drop did not ignite the underlying parts (Yes/No).....					Yes
Supplementary information:					

1.16 (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:					



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Clause	Requirement + Test	Result - Remark	Verdict
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ANNEX 1 components					P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity
Lead wire to driver	DONGGUAN ZHIHE ELECTRICAL CABLE TECH CO LTD	8043	0.5mm ² , 200°C, 300/500V, double-insulated	VDE 0250	VDE 40043532
Alternative	Dongguan Rizhan Electronics Co Ltd	1332	20AWG, 300V; 200°C; double-insulated	--	UL E528300
Alternative	DONGGUAN ZHIHE ELECTRICAL CABLE TECH CO LTD	1332	20AWG, 300V; 200°C; double-insulated	--	UL E258239
Earth wire	Zhongshan Guzhen Pinzheng Wire and Electric Appliance Factory	H05V-K	0.75mm ²	EN 50525-2-31	VDE 40044733
Alternative	Guangdong Detong Electric Wire & Cable Co., Ltd.	H05V-K	0.75mm ²	EN 50525-2-31	VDE 40050475
Alternative	Jiangmen Tingjia Wire Co., Ltd	H05V-K	0.75mm ²	EN 50525-2-31	VDE 40057301
Driver 1	Zhongshan Wukong lighting Co., LTD	TITI-GP0310F02-700	Input: 100-277VAC; 50/60Hz; Max.0.2A Output: 8-15VDC Uout: 25VDC; 700mA; Max.10.5W; ta:25°C; tc:85°C	EN 61347-1 EN 61347-2-13	CE
Driver 2	Zhongshan Wukong lighting Co., LTD	TITI-GP0715F05-700	Input: 100-277VAC; 50/60Hz; Max.0.222A Output: 15-20VDC Uout: 30VDC; 700mA; Max.14W; ta:25°C; tc:80°C	EN 61347-1 EN 61347-2-13	CE
Driver 3	Zhongshan Wukong lighting Co., LTD	TITI-GP0310F02-200	Input: 100-277VAC; 50/60Hz; Max.0.15A Output: 27-42VDC Uout: 50VDC; 250mA; Max.8.4W; ta:25°C; tc:80°C	EN 61347-1 EN 61347-2-13	CE
Output wire of driver	Guangdong Detong Electric Wire & Cable Co., Ltd.	2464	22AWG; 300V; 80°C	--	UL E491958
Alternative	Guangdong Detong Electric Wire & Cable Co., Ltd.	1007	22AWG; 300V; 80°C	--	UL E491958
LED	Bridgelux	BXEX-**G-11H-3A1-00-0-0	I _F =700mA; V _F =2.8-3.2V; 2700-6800K	IEC/TR 62778	Tested with appliance



IEC 60598-2-1					
Clause	Requirement + Test	Result - Remark			Verdict
LED board	WING SHING ELECTRONIC & PCB LTD	YS-4	V-0; AI	--	UL E190407
LED lens	GUANGDONG WAYLAM ENGINEERING PLASTICS Co., LTD	PC-F2805	PC; V-0	--	UL E257285
LED cover	NAN YA PLASTICS (HUI ZHOU) CORP LTD	5420G6	PC; V-0	--	UL E235269
COB	Bridgelux	BXKC- **G1501-B-1*	I _F =200mA; V _F =35.5V; 2700-6500K	IEC/TR 62778	Tested with appliance
COB board	Guangdong Huarui High-Tech Materials Co.,Ltd.	SPS-AL-01, HR-01	V-0; AI	--	UL E497857
COB cover	WANHUA CHEMICAL GROUP CO LTD	A1105	PC; V-2	--	UL E351523
COB lens	GUANGDONG WAYLAM ENGINEERING PLASTICS Co., LTD	PC-F2805	PC; V-0	--	UL E257285
Heat shrinkable tube	SHENZHEN WOLIDA TRADING CO LTD	RSFR-H	600VAC; 125°C	--	UL E329530



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

ANNEX 2	Temperature measurements, thermal tests of Section 12		P
----------------	--	--	----------

ANNEX 2-1	Type reference	Dio S-6	—
	Lamp used.....	Integral LED	—
	Lamp control gear used	TITI-GP0715F05-700	—
	Mounting position of luminaire	Acc. to user manual	—
	Supply wattage (W).....	--	—
	Supply current (A)	--	—
	Temperatures in test 1 - 4 below are corrected for ta (°C)	25.0	P
	- abnormal operating mode	--	—
1.12 (12.4)	- test 1: rated voltage	--	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current	1.06 times rated voltage a: 100 x 1.06=106V b: 277 x 1.06=293.6V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage	--	—
	Through wiring or looping-in wiring loaded by a current of A during the test	--	—
1.12 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current.....	--	—

Temperature measurements, (°C)

Par	Ambient	Clause 12.4 – normal					Clause 12.5 – abnormal	
		test 1	test 2		test 3	limit	test 4	limit
			a	b				
Lead wire to driver	25.0	--	73.4	72.5	--	200	--	--
Driver(Tc)	25.0	--	77.9	78.9	--	80	--	--
Output wire of driver	25.0	--	78.3	79.2	--	80	--	--
LED board	25.0	--	78.7	80.0	--	Ref.	--	--
LED lens	25.0	--	100.5	104.4	--	Ref.	--	--
Lamp cover	25.0	--	72.7	73.5	--	Ref.	--	--
Mounting surface	25.0	--	61.0	61.6	--	90	--	--
Illuminated surface (0.1m)	25.0	--	39.1	39.5	--	90	--	--

Supplementary information:



IEC 60598-2-1

Clause	Requirement + Test	Result - Remark	Verdict
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ANNEX 2-2	Type reference	Serra 10W	—
	Lamp used.....	Integral LED	—
	Lamp control gear used	TITI-GP0310F02-200	—
	Mounting position of luminaire	Acc. to user manual	—
	Supply wattage (W).....	--	—
	Supply current (A)	--	—
	Temperatures in test 1 - 4 below are corrected for t_a (°C)	25.0	P
	- abnormal operating mode	--	—
1.12 (12.4)	- test 1: rated voltage	--	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current	1.06 times rated voltage a: $100 \times 1.06=106V$ b: $277 \times 1.06=293.6V$	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage	--	—
	Through wiring or looping-in wiring loaded by a current of A during the test	--	—
1.12 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current.....	--	—

Temperature measurements, (°C)

Par	Ambient	Clause 12.4 – normal					Clause 12.5 – abnormal	
		test 1	test 2		test 3	limit	test 4	limit
			a	b				
Lead wire to driver	25.0	--	71.2	76.0	--	200	--	--
Driver(T_c)	25.0	--	74.3	79.5	--	80	--	--
Output wire of driver	25.0	--	69.5	74.3	--	80	--	--
COB board	25.0	--	62.5	64.5	--	Ref.	--	--
COB lens	25.0	--	98.9	101.4	--	Ref.	--	--
Reflector	25.0	--	53.1	54.2	--	Ref.	--	--
Mounting surface	25.0	--	52.2	53.7	--	90	--	--
Illuminated surface (0.1m)	25.0	--	37.5	38.2	--	90	--	--
Supplementary information:								



IEC 60598-2-1			
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 (mm ²).....	--	N
(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)	--	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 60598-2-1			
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



IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N)		N
(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)	TABLE: Contact resistance test / Heating tests										N
(15.6.3.2)	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										N
	Voltage drop after 10th alt. 25th cycle										N
	Max. allowed voltage drop (mV).....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Voltage drop after 50th alt. 100th cycle										N
	Max. allowed voltage drop (mV).....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Continued ageing: voltage drop after 10th alt. 25th cycle										N
	Max. allowed voltage drop (mV).....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Continued ageing: voltage drop after 50th alt. 100th cycle										N
	Max. allowed voltage drop (mV).....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
Supplementary information:											



EN IEC 60598-2-1			
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 60598-2-1 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES Luminaires Part 2: Particular Requirements: Section One – Fixed general purpose luminaires	
Differences according to.....:	EN IEC 60598-2-1:2021 used in conjunction with EN IEC 60598-1:2021+A11:2022
Annex Form No.....:	--
Annex Form Originator.....:	--
Master Annex Form.....:	--
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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
	GB: Requirements according to United Kingdom Building Regulation		N



EN IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
ANNEX 6	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 <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Independent module	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Integral module	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	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 1)	N
	Part of the luminaire	(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 luminaire	(see Annex 3)	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 IEC 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 $\geq 2 \text{ M}\Omega$	> 100 MΩ	P
	For double or reinforced insulation $\geq 4 \text{ M}\Omega$	--	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		N
	Working voltage $\leq 50 \text{ V}$, test voltage 500 V		N
	Working voltage $> 50 \text{ V} \leq 1000 \text{ V}$, test voltage (V):		P
	Basic insulation, $2U + 1000 \text{ V}$		P
	Supplementary insulation, $2U + 1000 \text{ V}$		N
	Double or reinforced insulation, $4U + 2000 \text{ V}$		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
- (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)	N



EN IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
	Creepage distances on printed boards less than specified in clause 16 in Part 1 provided with coating according to IEC 60664-3	(see appended table)	P
- (14.2)	Short-circuit or interruption of semiconductor devices	LED	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)	P
- (14.5)	After the tests has been carried out on three samples:		P
	The insulation resistance $\geq 1 \text{ M}\Omega$	$> 100 \text{ M}\Omega$	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 $> 15 \text{ min.}$		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
14	TABLE: tests of fault conditions		N
15	CONSTRUCTION		P
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
16	CREEPAGE DISTANCES AND CLEARANCES		N
	Creepage and distances and clearances in compliance with IEC 60598-1		N
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
	- part tested; temperature ($^{\circ}\text{C}$).....	See Test Table 19 (18.1)	N
(18.2)	Test of printed boards		N



EN IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
	- part tested.....:	See Test Table 19 (18.2)	N
(18.3)	Glow-wire test (650°C):		N
	- part tested.....:	See Test Table 19 (18.3)	N
(18.4)	Needle flame test (10 s):		N
	- part tested.....:	See Test Table 19 (18.4)	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	RG1 unlimited	P
22.3	Infrared radiation		N
A	ANNEX A - TESTS		P
	All tests performed in accordance with the advice given in Annex H of IEC 61347-1, if applicable		P



IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

Annex 7	Retinal blue light hazard Of Lamps And Lamp Systems IEC TR 62778:2014	P
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Annex 7-1	TABLE: Spectroradiometric measurement			P	
	Measurement performed on:	<input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input checked="" type="checkbox"/> Luminaire		—	
	Model number	Dio S-6		—	
	Test voltage (V)	277V		—	
	Test current (mA)	--		—	
	Test frequency (Hz)	--		—	
	Ambient, t (°C)	25.3		—	
	Measurement distance	<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm		—	
	Source size	<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small : mm		—	
	Field of view	<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)		—	
	Item	Symbol	Units	Result	Remark
	Correlated colour temperature	CCT	K	--	—
	x/y colour coordinates	---	---	-- / --	—
	Blue light hazard radiance	L _B	W/(m ² ·sr ¹)	1.315e+003	—
	Blue light hazard irradiance	E _B	W/m ²	--	—
	Luminance	L	cd/m ²	2.518e+006	—
	Illuminance	E	lx	--	—
Lamp classification group: RG1 unlimited.					



IEC TR 62778

Clause	Requirement + Test	Result - Remark	Verdict
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Annex 7-2	TABLE: Spectroradiometric measurement			P	
	Measurement performed on:	<input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input checked="" type="checkbox"/> Luminaire		—	
	Model number	:	Serra 10W	—	
	Test voltage (V)	:	277V	—	
	Test current (mA)	:	--	—	
	Test frequency (Hz)	:	--	—	
	Ambient, t (°C)	:	25.3	—	
	Measurement distance	:	<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm	—	
	Source size	:	<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small : mm	—	
	Field of view	:	<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)	—	
	Item	Symbol	Units	Result	Remark
	Correlated colour temperature	CCT	K	--	—
	x/y colour coordinates	---	---	-- / --	—
	Blue light hazard radiance	L _B	W/(m ² ·sr ¹)	1.399e+003	—
	Blue light hazard irradiance	E _B	W/m ²	--	—
	Luminance	L	cd/m ²	2.828e+006	—
	Illuminance	E	lx	--	—
Lamp classification group: RG1 unlimited.					



EN 62493			
Clause	Requirement + Test	Result - Remark	Verdict
ANNEX 8	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 <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	2) incandescent-lamp technology	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	3) LED-light-source technology	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	4) OLED-light-source technology	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	5) high-pressure discharge lamp	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	6) low-pressure discharge lamp technologies with exposure distance ≥ 50 cm	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	7) independent auxiliary	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	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 $P_{\text{int,rad}}$		—
	Exclusion level P_{max}		—
	Input power $P_{\text{int,rad}} < \text{exclusion level } P_{\text{max}}$		N
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



EN 62493			
Clause	Requirement + Test	Result - Remark	Verdict
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 =====

WALTEK



Photo Documentation

Model: Dio S-6



Photo 1



Photo 2



Photo Documentation

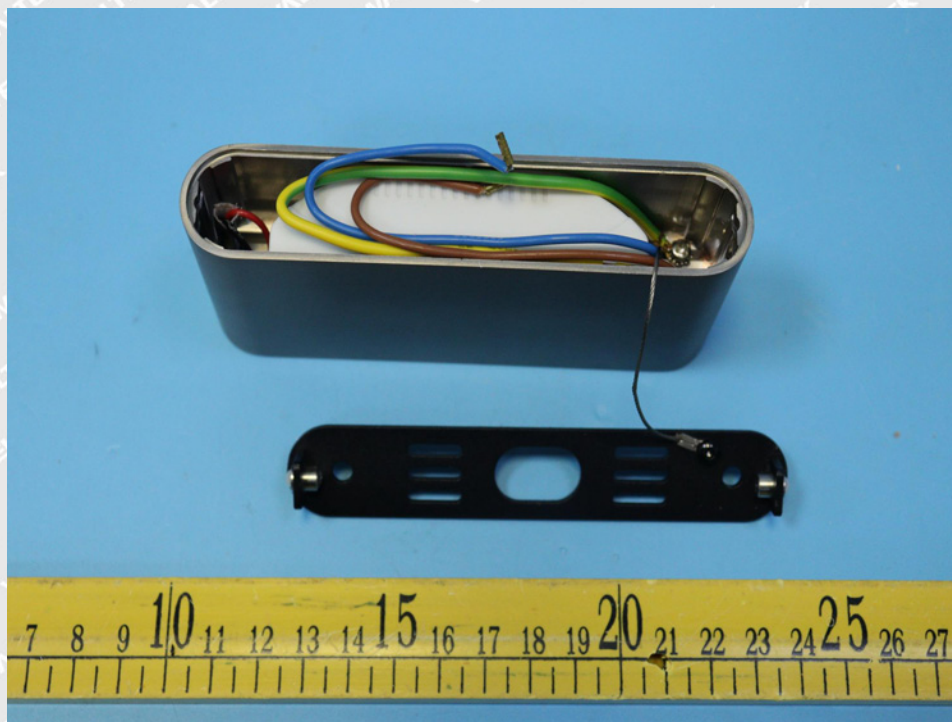


Photo 3



Photo 4

Heat shrinkable tubefixed on the fixed wiring for all models (served as supplementary insulation)



Photo Documentation

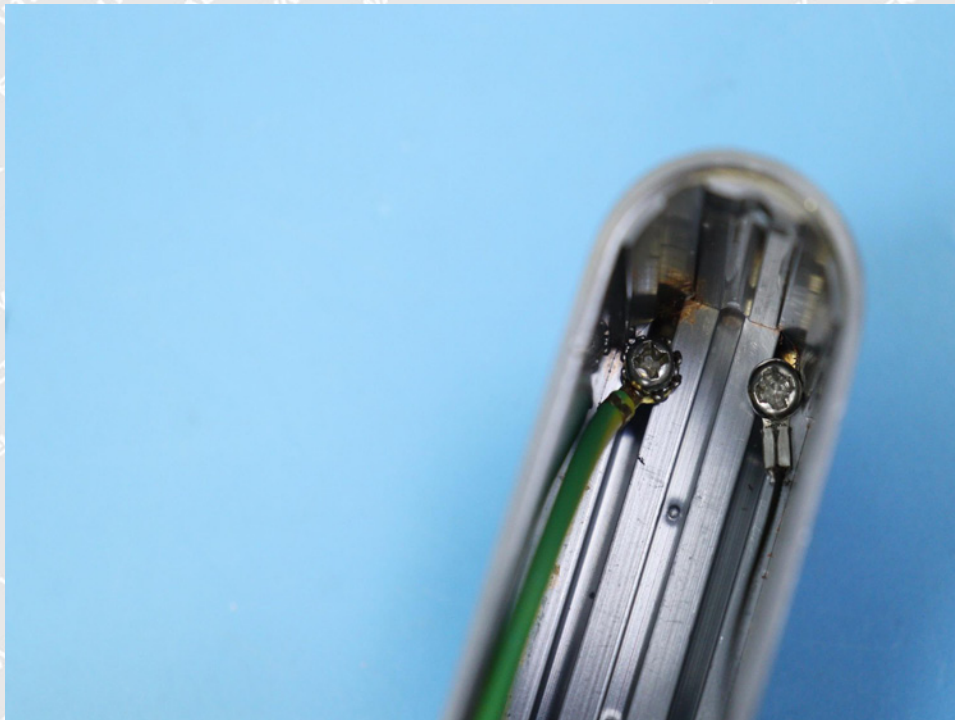


Photo 5



Photo 6



Photo Documentation



Photo 7



Photo 8



Photo Documentation

Model: Serra 10W



Photo 9



Photo 10



Photo Documentation



Photo 11

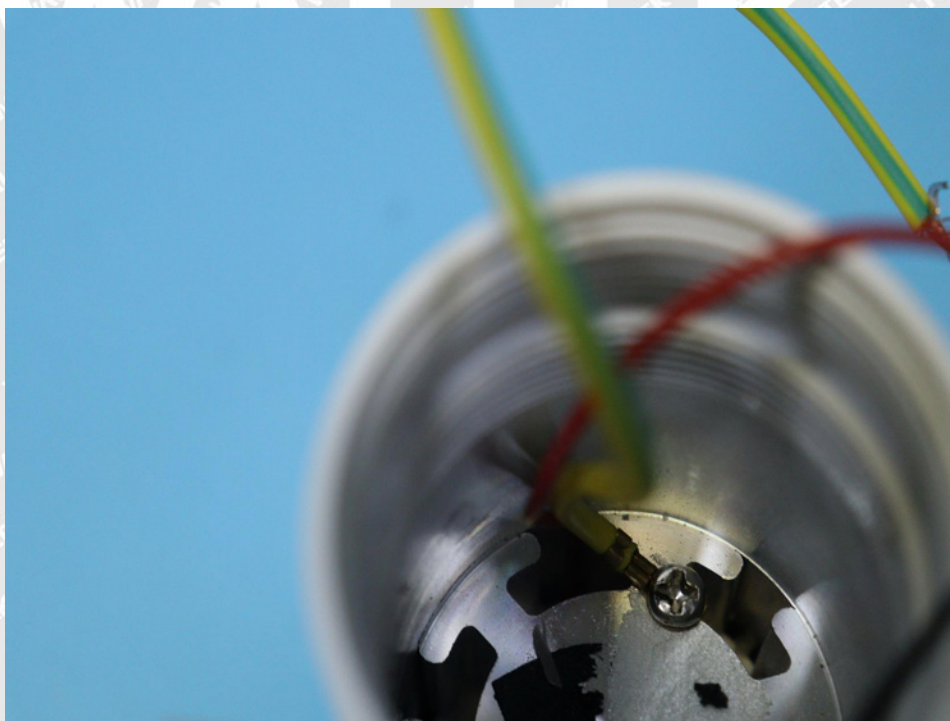


Photo 12



Photo Documentation



Photo 13



Photo 14



Photo Documentation

Model: Dio S-6



Photo 15



Photo 16

====End of Photo====