



TEST REPORT

Reference No...... WTD15D0730387S
Applicant..... HOMING LIGHTING (SHENZHEN) LIMITED
Address..... Building 15 and 9, Nandong Huangpu Road No 46, Shajing Town,
Baoan County, Shenzhen City.
Manufacturer..... HOMING LIGHTING (SHENZHEN) LIMITED
Address..... Building 15 and 9, Nandong Huangpu Road No 46, Shajing Town,
Baoan County, Shenzhen City.
Product Name..... Floor lamp
Model No..... FL1089E-2(49150003/01)
Standards..... Luminaires-Part 2: Particular Requirements-Section Four – Portable
General Purpose Luminaries
EN 60598-2-4:1997 used in conjunction with
EN 60598-1:2015
Date of Receipt sample..... July 22, 2015
Date of Test..... July 22, 2015 to August 18, 2015
Date of Issue..... August 21, 2015
Test Report Form No...... WSL-6059824A-02A
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 compiler and approver.

Prepared By:

Waltek Services (Dongguan) Co., Ltd.

Address: 8/F, Hongyi Buiding, WuShiGang ZhuShan, DongCheng District, Dongguan, Guangdong, China.

Tel: (86)769-22676998

Fax: (86)769-22676828

Compiled by:

Run Huang / Project Engineer

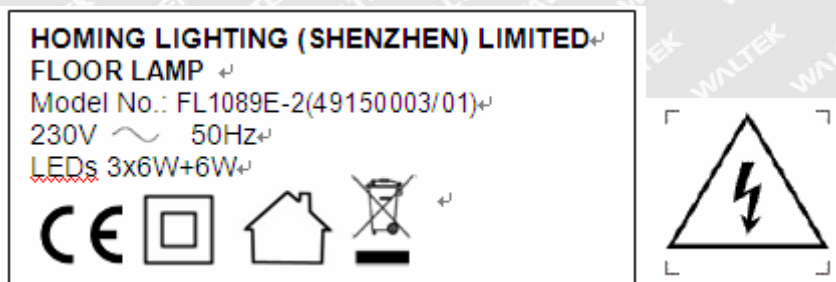
Approved by:



Roger Lynn / Manager



Test item description..... : Floor lamp
Trade Mark..... : N/A
Model/Type reference..... : FL1089E-2(49150003/01)
Ratings..... : 230V~, 50Hz, LEDs 3x6W+6 W; IP20, Class II.

Copy of marking plate:

On the luminaires enclosure

Note: The height of graphical symbol is not less than 7mm for the marking of electrical and electronic equipment, and not less than 5mm for other markings, the height of letters and numerals at least 2mm.

Summary of testing:

- All the test result complies with the requirement of the relevant standard.
- Assessment Of Lighting Equipment Related To Human Exposure To Electromagnetic Fields was evaluated according to EN 62493:2010.
- EN 62471:2008 was evaluated, classification group: exempt ☒ risk 1 ☐ risk 2 ☐ risk 3 ☐.
- LED module is assessed according to standard EN 62031:2008+A1:2013.
- Only the most unfavourable results are recorded in this report.

WALTEK



Test items particulars:	--
Classification of installation and use	Portable
Supply Connection	Non-detachable flexible cords with plug used
.....	--
.....	--
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. This report only assessed the lighting function of the product.	
General product information: 1. This is a portable luminaire. 2. For indoor use, Class II, IP20. 3. Connected to supply via non-detachable flexible cords with plug. 4. Model FL1089E-2 and 49150003/01 are the same product with two model names.	

WALTEK



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

4.2 (0)	GENERAL TEST REQUIREMENTS			
4.2 (0.1)	Information for luminaire design considered	Standard Yes ☒ No ☐		—
4.2 (0.3)	More sections applicable	Yes ☐ No ☒		—

4.4 (2)	CLASSIFICATION			
4.4 (2.2)	Type of protection	Class II		—
4.4 (2.3)	Degree of protection	IP20		—
4.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces	Yes ☒ No ☐		—
4.4 (2.5)	Luminaire for normal use	Yes ☒ No ☐		—
	Luminaire for rough service	Yes ☐ No ☒		—

4.5 (3)	MARKING			P
4.5 (3.2)	Mandatory markings	See rating label		P
	Position of the marking			P
	Format of symbols/text			P
4.5 (3.3)	Additional information			P
	Language of instructions	English		P
4.5 (3.3.1)	Combination luminaires			N
4.5 (3.3.2)	Nominal frequency in Hz	50Hz		P
4.5 (3.3.3)	Operating temperature			N
4.5 (3.3.4)	Symbol or warning notice			N
4.5 (3.3.5)	Wiring diagram			N
4.5 (3.3.6)	Special conditions			N
4.5 (3.3.7)	Metal halide lamp luminaire – warning			N
4.5 (3.3.8)	Limitation for semi-luminaires			N
4.5 (3.3.9)	Power factor and supply current			N
4.5 (3.3.10)	Suitability for use indoors			N
4.5 (3.3.11)	Luminaires with remote control			N
4.5 (3.3.12)	Clip-mounted luminaire – warning			N
4.5 (3.3.13)	Specifications of protective shields			N
4.5 (3.3.14)	Symbol for nature of supply	~		P
4.5 (3.3.15)	Rated current of socket outlet			N



EN 60598-2-4			
Clause	Requirement – Test	Result - Remark	Verdict
4.5 (3.3.16)	Rough service luminaire		N
4.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments	Type Y	P
4.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N
4.5 (3.3.19)	Protective conductor current in instruction if applicable		N
4.5 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N
4.5 (3.3.21)	Non replaceable and non-user replaceable light sources information provided		N
	Cautionary symbol		N
4.5 (3.3.22)	Controllable luminaires, insulation		N
4.5 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P

4.6 (4)	CONSTRUCTION		P
4.6 (4.2)	Components replaceable without difficulty		P
4.6 (4.3)	Wireways smooth and free from sharp edges		P
4.6 (4.4)	Lampholders		N
4.6 (4.4.1)	Integral lampholder		N
4.6 (4.4.2)	Wiring connection		N
4.6 (4.4.3)	Lampholder for end-to-end mounting		N
4.6 (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 have not moved from its position and show no permanent deformation		N
4.6 (4.4.5)	Peak pulse voltage		N
4.6 (4.4.6)	Centre contact		N
4.6 (4.4.7)	Parts in rough service luminaires resistant to tracking		N



EN 60598-2-4			
Clause	Requirement – Test	Result - Remark	Verdict
4.6 (4.4.8)	Lamp connectors		N
4.6 (4.4.9)	Caps and bases correctly used		N
4.6 (4.5)	Starter holders		N
	Starter holder in luminaires other than class II		N
	Starter holder class II construction		N
4.6 (4.6)	Terminal blocks		N
	Tails		N
	Unsecured blocks		N
4.6 (4.7)	Terminals and supply connections		P
4.6 (4.7.1)	Contact to metal parts		N
4.6 (4.7.2)	Test 8 mm live conductor		N
	Test 8 mm earth conductor		N
4.6 (4.7.3)	Terminals for supply conductors		P
4.6 (4.7.3.1)	Welded connections:		N
	- stranded or solid conductor		N
	- spot welding		N
	- welding between wires		N
	- Type Z attachment		N
	- mechanical test according to 15.8.2		N
	- electrical test according to 15.9		N
	- heat test according to 15.9.2.3 and 15.9.2.4		N
4.6 (4.7.4)	Terminals other than supply connection		N
4.6 (4.7.5)	Heat-resistant wiring/sleeves		N
4.6 (4.7.6)	Multi-pole plug		N
	- test at 30 N		N
4.6 (4.8)	Switches:		P
	- adequate rating	See Annex 1	P
	- adequate fixing		P
	- polarized supply		N
	- compliance with EN 61058-1 for electronic switches		N
4.6 (4.9)	Insulating lining and sleeves		P
4.6 (4.9.1)	Retainment		P
	Method of fixing		—



EN 60598-2-4			
Clause	Requirement – Test	Result - Remark	Verdict
4.6 (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
4.6 (4.10)	Insulation of Class II luminaires		N
4.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		N
	Safe installation fixed luminaires		N
	Capacitors and switches		N
	Interference suppression capacitors according to EN 60384-14		N
4.6 (4.10.2)	Assembly gaps:		N
	- not coincidental		N
	- no straight access with test probe		N
4.6 (4.10.3)	Retainment of insulation:		P
	- fixed		P
	- unable to be replaced; luminaire inoperative		P
	- sleeves retained in position		P
	- lining in lampholder		P
4.6 (4.11)	Electrical connections		P
4.6 (4.11.1)	Contact pressure		P
4.6 (4.11.2)	Screws:		N
	- self-tapping screws		N
	- thread-cutting screws		N
4.6 (4.11.3)	Screw locking:		N
	- spring washer		N
	- rivets		N
4.6 (4.11.4)	Material of current-carrying parts		P
4.6 (4.11.5)	No contact to wood or mounting surface		P
4.6 (4.11.6)	Electro-mechanical contact systems		N
4.6 (4.12)	Mechanical connections and glands		P
4.6 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		P



EN 60598-2-4			
Clause	Requirement – Test	Result - Remark	Verdict
	Torque test: torque (Nm); part..... :	Screws used for fixing lampshade, $\Phi 3.87\text{mm}$, 1.2 Nm, five times	P
	Torque test: torque (Nm); part..... :	Screws used for fixing power cord, 0.5 Nm, five times	P
	Torque test: torque (Nm); part..... :		N
4.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N
4.6 (4.12.4)	Locked connections:		P
	- fixed arms; torque (Nm)	>M10; 5.0Nm	P
	- lampholder; torque (Nm)		N
	- push-button switches; torque 0,8 Nm		N
4.6 (4.12.5)	Screwed glands; force (Nm)..... :		N
4.6 (4.13)	Mechanical strength		P
4.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm)		N
	- other parts; energy (Nm)..... :	Enclosure, 0.5Nm, 3 times	P
	1) live parts		P
	2) linings		P
	3) protection		P
	4) covers		P
4.6 (4.13.3)	Straight test finger		P
4.6 (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
4.6 (4.13.6)	Tumbling barrel		N
4.6 (4.14)	Suspensions and adjusting devices		P
4.6 (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



EN 60598-2-4			
Clause	Requirement – Test	Result - Remark	Verdict
	E) clip-mounted luminaires, glass-shelve. Thickness (mm)		N
	Metal rod. diameter (mm)		N
	Fixed luminaire or independent control gear without fixing devices		N
4.6 (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
4.6 (4.14.3)	Adjusting devices:		P
	- flexing test; number of cycles.....	1500 cycles	P
	- strands broken	< 50 %	P
	- electric strength test afterwards		N
4.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N
4.6 (4.14.5)	Guide pulleys		N
4.6 (4.14.6)	Strain on socket-outlets		N
4.6 (4.15)	Flammable materials:		N
	- glow-wire test 650°C		N
	- spacing ≥30 mm		N
	- screen withstanding test of 13.3.1		N
	- screen dimensions		N
	- no fiercely burning material		N
	- thermal protection		N
	- electronic circuits exempted		N
4.6 (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
4.6 (4.16)	Luminaires for mounting on normally flammable surfaces		P
	No lamp control gear	(compliance with Section 12)	P
4.6 (4.16.1)	Lamp control gear spacing:		N
	- spacing 35 mm		N
	- spacing 10 mm		N



EN 60598-2-4			
Clause	Requirement – Test	Result - Remark	Verdict
4.6 (4.16.2)	Thermal protection:		N
	- in lamp control gear		N
	- external		N
	- fixed position		N
	- temperature marked lamp control gear		N
4.6 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N
4.6 (4.17)	Drain holes		N
	Clearance at least 5 mm		N
4.6 (4.18)	Resistance to corrosion:		P
4.6 (4.18.1)	- rust-resistance		N
4.6 (4.18.2)	- season cracking in copper		P
4.6 (4.18.3)	- corrosion of aluminium		N
4.6 (4.19)	Igniters compatible with ballast		N
4.6 (4.20)	Rough service vibration		N
4.6 (4.21)	Protective shield:		N
4.6 (4.21.1)	Shield fitted		N
	Shield of glass if tungsten halogen lamps		N
4.6 (4.21.2)	Particles from a shattering lamp not impair safety		N
4.6 (4.21.3)	No direct path		N
4.6 (4.21.4)	Impact test on shield		N
	Glow-wire test on lamp compartment :	See Test Table 4.15 (13.3.2)	N
4.6 (4.22)	Attachments to lamps		N
4.6 (4.23)	Semi-luminaires comply Class II		N
4.6 (4.24.1)	UV radiation for tungsten halogen lamps and metal halide lamps (Annex P)		N
4.6 (4.24.2)	Retinal blue light hazard		N
	Luminaires with E_{thr}		N
	a) Fixed luminaires		N
	Distance x m, borderline between RG1 and RG2..... :		N
	Marking and instruction		N
	b) Portable and handheld luminaires		N
	RG1 exceeded at 200 mm according to EN/TR 62778		N
	Marking		N



EN 60598-2-4			
Clause	Requirement – Test	Result - Remark	Verdict
	Portable luminaires for children EN 60598-2-10 and Mains socket outlet nightlights EN 60598-2-12		N
	RG at 200 mm according to EN/62778		N
4.6 (4.25)	No sharp point or edges		P
4.6 (4.26)	Short-circuit protection:		N
4.6 (4.26.1)	Uninsulated accessible SELV parts		N
4.6 (4.26.2)	Short-circuit test		N
4.6 (4.26.3)	Test chain according to Figure 29		N
4.6 (4.27)	Terminal blocks with integrated screwless earthing contacts tested 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
4.6 (4.28)	Fixing of thermal sensing control		N
	External to lamp control gear		N
	Plug-in or easily replaceable type		N
	Adhesive fixing		N
	Positioning		N
	Temperature (°C)		N
	100 cycles between t min and t max		N
	Temperature sensing control still in position		N
4.6 (4.29)	Luminaires with non-replaceable light source		N
	Replacement not possible		N
	Live part not accessible		N
	Breaking of the luminaire or its parts		N
	Removal of parts		N
	Compliance with test probe		N
	Access to live parts		N
4.6 (4.30)	Luminaires with non-user replaceable light source		N
	Protective cover		N
	Fixing means		N
	Cautionary symbol		N
4.6 (4.31)	Insulation between circuits		N



EN 60598-2-4			
Clause	Requirement – Test	Result - Remark	Verdict
	Transformer or control gears		N
	Insulation between circuits		N
	Circuits insulated from LV supply		N
	Insulation provided		N
	Controllable luminaires		N
	Control terminals		N
	Insulation		N
	Control gear U-OUT		N
4.6 (4.31.1)	SELV circuits		N
	Source		N
	Insulation between circuits		N
	Control gear U-OUT		N
	Plug and socket outlet		N
4.6 (4.31.2)	FELV circuits		N
	Source		N
	Insulation between circuits		N
	Plug and socket outlet		N
4.6 (4.31.3)	Other circuits		N
	CI II		N
	Equipotential bonding		N
	All conductive part connected		N
	Resistance < 0,5 Ω:		N
	Insulation fault: accessible part cause electric shock		N
	Master/slave applications		N
4.6 (4.32)	Overvoltage protective devices		N
	External to lamp control gear, connected to earth		N
	Fixed luminaires connected to a protective earth		N
4.6.1 (-)	Insulation not damaged when placing on support		P
4.6.2 (-)	Wiring fixed, to avoid rubbing		P
4.6.3 (-)	Stability (6°)		P
4.6.4 (-)	Candlestick luminaires with switch		N
4.6.5 (-)	E5 lampholders		N
4.7 (11)	CREEPAGE DISTANCES AND CLEARANCES		P
4.7 (11.2)	Creepage distances and clearances.....:	See Table 4.7 (11.2)	P



EN 60598-2-4			
Clause	Requirement – Test	Result - Remark	Verdict
	Working voltage (V)..... :	230V	—
	Rated pulse voltage (kV)..... :	--	—
	Voltage form	Sinusoidal ☒ Non-sinusoidal ☐	—
	PTI	< 600 ☒ ≥ 600 ☐	—
	Impulse withstand category (Normal category II) (Category III Annex U)	Category II ☒ Category III ☐	—

4.8 (7)	PROVISION FOR EARTHING		N
4.8 (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
	Earth makes contact first		N
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N
	Built-in control gear		N
4.8 (7.2.2 + 7.2.3)	Earth continuity in joints, etc.		N
4.8 (7.2.4)	Locking of clamping means		N
	Compliance with 4.7.3		N
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N
4.8 (7.2.5)	Earth terminal integral part of connector socket		N
4.8 (7.2.6)	Earth terminal adjacent to mains terminals		N
4.8 (7.2.7)	Electrolytic corrosion of the earth terminal		N
4.8 (7.2.8)	Material of earth terminal		N
	Contact surface bare metal		N
4.8 (7.2.10)	Class II luminaire for looping-in		N
	Double or reinforced insulation to functional earth		N
4.8 (7.2.11)	Earthing core coloured green-yellow		N
	Length of earth conductor		N



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

4.9 (14)	SCREW TERMINALS		N
	Separately approved; component list..... :	(see Annex 1)	N
	Part of the luminaire :	(see Annex 3)	N
4.9 (15)	SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS		N
	Separately approved; component list..... :	(see Annex 1)	N
	Part of the luminaire :	(see Annex 4)	N
4.10 (5)	EXTERNAL AND INTERNAL WIRING		P
4.10 (5.2)	Supply connection and external wiring		P
4.10 (5.2.1)	Means of connection	Non-detachable flexible cords with plug used	P
4.10 (5.2.2)	Type of cable	(See Annex 1)	P
	Nominal cross-sectional area (mm ²)	(See Annex 1)	P
	Cables equal to EN 60227 or EN 60245		P
4.10 (5.2.3)	Type of attachment, X, Y or Z	Type Y	P
4.10 (5.2.5)	Type Z not connected to screws		N
4.10 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
4.10 (5.2.7)	Cable entries through rigid material have rounded edges		P
4.10 (5.2.8)	Insulating bushings:		P
	- suitably fixed		P
	- material in bushings		P
	- material not likely to deteriorate		P
	- tubes or guards made of insulating material		P
4.10 (5.2.9)	Locking of screwed bushings		N
4.10 (5.2.10)	Cord anchorage:		P
	- covering protected from abrasion		P



EN 60598-2-4			
Clause	Requirement – Test	Result - Remark	Verdict
	- 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
4.10 (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
4.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment	Type Y	P
4.10 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N)	60Nm	P
	- torque test: torque (Nm).....	0.15Nm	P
	- displacement ≤ 2 mm	<1.0 mm	P
	- no movement of conductors		P
	- no damage of cable or cord		P
4.10 (5.2.11)	External wiring passing into luminaire		P
4.10 (5.2.12)	Looping-in terminals		N
4.10 (5.2.13)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N
4.10 (5.2.14)	Mains plug same protection		P
	Class III luminaire plug		P
	No unsafe compatibility		N
4.10 (5.2.16)	Appliance inlets (EN 60320)		N



EN 60598-2-4			
Clause	Requirement – Test	Result - Remark	Verdict
	Installation couplers (EN 61535)		N
	Other appliance inlet or connector		N
	Relevant EN standard		N
4.10 (5.2.17)	No standardized interconnecting cables properly assembled		N
4.10 (5.2.18)	Used plug in accordance with		N
	- EN 60083		N
	- other standard		N
4.10 (5.3)	Internal wiring		P
4.10 (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 earth only		N
4.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P
	Cross-sectional area (mm ²)		P
	Insulation thickness		P
	Extra insulation added where necessary		N
4.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		N
	Adequate cross-sectional area and insulation thickness		N
4.10 (5.3.1.3)	Double or reinforced insulation for class II		N
4.10 (5.3.1.4)	Conductors without insulation		N
4.10 (5.3.1.5)	SELV current-carrying parts		N
4.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N
4.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N
	Joints, raising/lowering devices		N



EN 60598-2-4			
Clause	Requirement – Test	Result - Remark	Verdict
	Telescopic tubes etc.		N
	No twisting over 360°		P
4.10 (5.3.3)	Insulating bushings:		P
	- suitable fixed		P
	- material in bushings		P
	- material not likely to deteriorate		P
	- cables with protective sheath		P
4.10 (5.3.4)	Joints and junctions effectively insulated		N
4.10 (5.3.5)	Strain on internal wiring		N
4.10 (5.3.6)	Wire carriers		N
4.10 (5.3.7)	Wire ends not tinned		N
	Wire ends tinned: no cold flow		P

4.11 (8)	PROTECTION AGAINST ELECTRIC SHOCK		P
4.11 (8.2.1)	Live parts not accessible		P
	Basic insulated parts not used on the outer surface without appropriate protection		P
	Basic insulated parts not accessible with standard test finger on portable, settable and adjustable luminaires		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		N
	Protection in any position		N
	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
4.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		P



EN 60598-2-4			
Clause	Requirement – Test	Result - Remark	Verdict
4.11 (8.2.3.a)	Class II luminaire:		P
	- basic insulated metal parts not accessible during starter or lamp replacement		P
	- basic insulation not accessible other than during starter or lamp replacement		P
	- glass protective shields not used as supplementary insulation		P
4.11 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N
4.11 (8.2.3.c)	Class III luminaires with exposed SELV parts:		N
	Ordinary luminaire:		N
	- touch current		N
	- no-load voltage.....		N
	Other than ordinary luminaire:		N
	- nominal voltage		N
4.11 (8.2.4)	Portable luminaire have protection independent of supporting surface		P
4.11 (8.2.5)	Compliance with the standard test finger or relevant probe		P
4.11 (8.2.6)	Covers reliably secured		P
4.11 (8.2.7)	Discharging of capacitors $\geq 0,5 \mu\text{F}$		P
	Portable plug connected luminaire with capacitor	14V after 1s	P
	Other plug connected luminaire with capacitor		N
	Discharge device on or within capacitor		P
	Discharge device mounted separately		N
4.11.1 (-)	Class I luminaire with bayonet lampholder:		N
	- cap not accessible with test finger		N
	- metal lampholder is earthed		N

4.12 (12)	ENDURANCE TEST AND THERMAL TEST		P
4.12 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 4.13		—
4.12 (12.3)	Endurance test:		
	- mounting-position.....	Acc. to user manual	—
	- test temperature (°C)	25+10°C	—



EN 60598-2-4			
Clause	Requirement – Test	Result - Remark	Verdict
	- total duration (h)	240h	—
	- supply voltage: Un factor; calculated voltage (V) ..	1.1 Un	—
	- lamp used.....	LEDs	—
4.12 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		P
	- marking legible		P
	- no cracks, deformation etc.		P
4.12 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
4.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2) overturned <15°	P
4.12 (12.6)	Thermal test (failed lamp control gear condition):		N
4.12 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A)		—
	- case of abnormal conditions		—
	- electronic lamp control gear		N
	- 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
4.12 (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
4.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N
4.12 (12.7.1)	Luminaire without temperature sensing control		N
4.12 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N
	Test method 12.7.1.1 or Annex W		—



EN 60598-2-4			
Clause	Requirement – Test	Result - Remark	Verdict
	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 4.15 (13.2.1)	N
4.12 (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 Table 4.15 (13.2.1)	N
4.12 (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
4.12 (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 Table 4.15 (13.2.1)	N
4.12 (-)	Test overturned position (overturns < 15°)		N



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

4.13 (9)	RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE		P
4.13 (-)	If IP > IP 20 the order of tests as specified in clause 4.12		P
4.13 (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 SELV parts or where it could become a hazard		N
	d) i) For luminaires without drain holes – no water entry		N
	d) ii) For luminaires with drain holes – no hazardous water entry		N
	e) no water in watertight luminaire		N
	f) no contact with live parts (IP 2X)	IP 20	P
	f) no entry into enclosure (IP 3X and IP 4X)		N
	f) no contact with live parts (IP3X and IP4X)		N
	g) no trace of water on part of lamp requiring protection from splashing water		N
	h) no damage of protective shield or glass envelope		N
4.13 (9.3)	Humidity test 48 h	25°C, 93%RH	P
4.14 (10)	INSULATION RESISTANCE AND ELECTRIC STRENGTH		P
4.14 (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	—
	Insulation resistance (MΩ)		P
	SELV		N
	- between current-carrying parts of different polarity:		N
	- between current-carrying parts and mounting surface.....	--	N

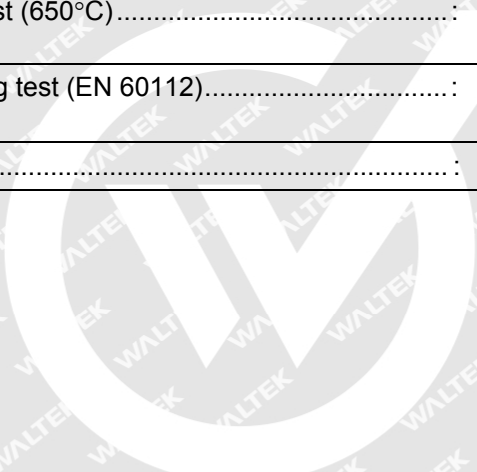


EN 60598-2-4			
Clause	Requirement – Test	Result - Remark	Verdict
	- between current-carrying parts and metal parts of the luminaire..... :	--	N
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :	--	N
	- Insulation bushings as described in Section 5		N
	Other than SELV		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..... :	>100MΩ	P
	- Insulation bushings as described in Section 5	>100MΩ	P
4.14 (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)		P
	SELV		N
	- between current-carrying parts of different polarity :		N
	- between current-carrying parts and mounting surface..... :	--	N
	- between current-carrying parts and metal parts of the luminaire..... :	--	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
	Other than SELV		P
	- between live parts of different polarity	1460V	P
	- between live parts and mounting surface	2920V	P
	- between live parts and metal parts	2920V	P
	- between live parts of different polarity through action of a switch..... :	--	N



EN 60598-2-4			
Clause	Requirement – Test	Result - Remark	Verdict
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :	1460V	P
	- Insulation bushings as described in Section 5 :	2920V	P
4.14 (10.3)	Touch current or protective conductor current (mA) :	Max. 0.005mA	P

4.15 (13)	RESISTANCE TO HEAT, FIRE AND TRACKING		P
4.15 (13.2.1)	Ball-pressure test :	See Test Table 4.15 (13.2.1)	P
4.15 (13.3.1)	Needle-flame test (10 s)..... :	See Test Table 4.15 (13.3.1)	P
4.15 (13.3.2)	Glow-wire test (650°C)..... :	See Test Table 4.15 (13.3.2)	P
4.15 (13.4.1)	Proof tracking test (EN 60112)..... :		N
	- part tested :		N



WALTEK



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

4.7 (11.2)	TABLES: Creepage distances and clearances						P
Table 11.1	Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages						P
RMS working voltage (V) not exceeding	50	150	250	500	750	1000	
Creepage distances							
Required basic insulation, PTI ≥ 600	0,6	0,8	1,5	3	4	5,5	
Measured	--	--	--	--	--	--	
Required basic insulation, PTI < 600	1,2	1,6	2,5	5	8	10	
Measured	--	--	See Note 1	--	--	--	
Required supplementary insulation PTI ≥ 600	-	0,8	1,5	3	4	5,5	
Measured	--	--	--	--	--	--	
Required supplementary insulation PTI < 600	-	1,6	2,5	5	8	10	
Measured	--	--	--	--	--	--	
Required reinforced insulation	-	3,2	5	6	8	11	
Measured	--	--	See Note 2	--	--	--	
Clearances							
Required basic insulation	0,2	0,8	1,5	3	4	5,5	
Measured	--	--	See Note 1	--	--	--	
Required supplementary insulation	-	0,8	1,5	3	4	5,5	
Measured	--	--	--	--	--	--	
Required reinforced insulation	-	1,6	3	6	8	11	
Measured	--	--	See Note 3	--	--	--	
Table 11.2	Minimum distances (mm) for non-sinusoidal pulse voltages						
Rated pulse voltage (peak kV)	2,0	2,5	3,0	4,0	5,0	6,0	8,0
Required clearances	1,0	1,5	2	3	4	5,5	8
Measured	--	--	--	--	--	--	
Rated pulse voltage (peak kV)	10	12	15	20	25	30	40
Required clearances	11	14	18	25	33	40	60
Measured	--	--	--	--	--	--	
Rated pulse voltage (peak kV)	50	60	80	100	-	-	-
Required clearances	75	90	130	170	-	-	-
Measured	--	--	--	--	--	--	



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

Note 1: > 3.0 mm, between live parts of different polarity.

Note 2: >3.0 mm, between outer surface of cable where it is clamped and metal parts.

Note 3: >6.0 mm, between live parts and mounting surface.

>6.0 mm, between live parts and accessible metal parts.

4.15 (13.2.1)	TABLE: Ball Pressure Test of Thermoplastics			P
Allowed impression diameter (mm) :		2.0		—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
Lampshade	SILVER AGE ENGINEERING PLASTICS (DONGGUAN) CO LTD	89.3	0.8mm	
LED PCB	Shenzhen Tongchuangxin electronics Co., Ltd	125	0.8mm	
LED PCB	Shenzhen Long jiang Industry Co., Ltd	125	0.8mm	
Supplementary information:				

WALTEK



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

4.15 (13.3.1)	TABLE: Needle-flame test (EN 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
Switch	Zhejiang LECI Electronics Co.,Ltd	2	Yes	2	P
--	--	--	--	--	--
Supplementary information:					

4.15 (13.3.2)	TABLE: Glow-wire test (EN 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
Lampshade	SILVER AGE ENGINEERING PLASTICS (DONGGUAN) CO LTD	0	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)					P
Supplementary information:					



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

Annex 1 TABLE: Critical components information						P
Object / part No.	Code	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity
Plug	B	Toong Yean Plastic Ind. Co., Ltd.	TY-011	2.5A 250V	EN 50075	VDE 40002154
	D	Yah Fei Electric Lighting Co. Ltd.	YF-C01	2.5A 250V	EN 50075	VDE 126677
	D	Arditi CN Electric (Huizhou) Co., Ltd.	2130	2.5A 250V	EN 50075	VDE 40000145
	D	Shenzhen MJM Electronic Co.,Ltd.	1011	2.5A 250V	EN 50075	DEKRA 2147130.01
Power cord,	B	Toong Yean Plastic Ind. Co., Ltd.	H03VVH2-F	2 x 0.75 mm ²	EN 50525-2-11	VDE 40024356
	D	Yah Fei Electric Lighting Co. Ltd.	H03VVH2-F	2 x 0.75 mm ²	EN 50525-2-11	VDE 40018964
	D	Arditi CN Electric (Huizhou) Co., Ltd.	H03VVH2-F	2 x 0.75 mm ²	EN 50525-2-11	VDE 40032075
	D	Shenzhen MJM Electronic Co., Ltd.	H03VVH2-F	2 x 0.75 mm ²	EN 50525-2-11	VDE 40036699
Switch	B	Zhejiang LECI Electronics Co.,Ltd	RS601D	AC 250V6A	EN 61058-1	TUV AN 50210043 0001
Internal wire	B	Feng Tai Electronic Co.,Ltd	Nr.7997	300/500V, 180°C	VDE 0250	VDE 40013289
	D	Yang Tai Wire & Cable Co.,Ltd	(N)6YAF (7718)	450/750V, 0.3 mm ² , 180°C	VDE 0250	VDE 40002489
	D	HengXing Dian Xian Fu Su Chang	HX (7590)	300/500V, 0.3 mm ² , 180°C	VDE 0250	VDE 131483
	D	Dongguan Zhihe Electrical Cable Tech Co., Ltd	(N)6YAF (8042)	300/500V, 22AWG, 180°C	VDE 0250	VDE 40017520
	D	Dongguan Qinda Wire Co., Ltd	(N)6YAR (8349)	450/750V, 0.5 mm ² , 180°C	VDE 0250	VDE 40028735
Heatshrinkable tube	B	GUANGZHOU KAIHENG ENTERPRISE GROUP	K-2(+)	600V, 125°C	UL 224	UL E214175
	D	SHENZHEN WOER HEAT-SHRINKABLE MATERIAL CO LTD	RSFR-H	600V; 125°C	UL 224	UL E203950
LED	B	Seoul Semiconductor Co.,Ltd	3030	40mA	IEC 62471	KOLAS I-130103-3-K-01
Fuse	B	AEM Components (Suzhou)Co.,Ltd	MF2410	AC 250V 1A	VDE 0820-1 VDE 0820	VDE 40034853



EN 60598-2-4						
Clause	Requirement – Test			Result - Remark		Verdict
LED PCB	B	Shenzhen Tongchuangxin electronics Co., Ltd	TCX-M, TCX	V-0, 130°C	UL 796	UL E250336
	D	Shenzhen Long jiang Industry Co., Ltd	LJ-M	V-0, 130°C	UL 796	UL E300052
Lampshade	B	SILVER AGE ENGINEERING PLASTICS (DONGGUAN) CO LTD	3370	V-0, 85°C 5VB,	UL 94	UL E225348
Mylar sheet	B	DONGGUAN CITY FIRST QUALITY SILICONE RUBBER ELECTRON MATERIAL CO LTD	YIP10020030 0100K(*)	V-0, 150°C, thickness min. 1.0mm	UL 94	UL E341634
	D	DONGGUAN GAOBU AOBOTE ELECTRONIC MATERIALS FACTORY	ABTCP800A BTSEB900AB TST600	V-0, 150°C, thickness min. 1.0mm	UL 94	UL E364005
	D	GUANG ZHOU PINK SUN ENTERPRISES CO LTD	PS-A	V-0, 150°C, thickness min. 1.0mm	UL 94	UL E229613
	D	Dongguan Huayue Thermal Technology Co Ltd	LA	V-0, 150°C, thickness min. 1.0mm	UL 94	UL E472302

The codes above have the following meaning:

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



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

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12					
	Type reference :	FL1089E-2(49150003/01)	—			
	Lamp used	LEDs	—			
	Lamp control gear used.....	Integral controlgear	—			
	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:					
	- abnormal operating mode	a. Overturned position under 15°	—			
	- test 1: rated voltage	--	—			
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage	1.06 x 240V=254.4V	—			
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage	--	—			
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage	1.1 x 240V=264V	—			
	Through wiring or looping-in wiring loaded by a current of A during the test	--	—			
	Temperature measurements, (°C)					
Part	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1	test 2	test 3	limit	test 4	limit
Power cord	--	28.9	--	90	--	--
Stressed power cord	--	29.4	--	90	--	--
Internal wire to LED PCB (big)	--	91.2	--	180	--	--
Internal wire to LED PCB (small)	--	73.2	--	180	--	--
Switch	--	27.7	--	55	--	--
LED PCB (big)	--	99.2	--	Ref.	--	--
Lampshade (internal)	--	64.3	--	For Cl.13	--	--
Lampshade (external)	--	57.4	--	75		



EN 60598-2-4						
Clause	Requirement – Test			Result - Remark		Verdict
Metal lampshade of Adjustable point	--	51.8	--	60	--	--
Mounting surface (flammable surface)	--	26.5	--	90	27.8	130
Surface illuminated by lamp(0.1m)	--	28.8	--	90	30.2	175
Ambient	--	25.0	--	--	25.0	--



WALTEK



EN 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 (mm ²)		—
(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

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



EN 60598-2-4			
Clause	Requirement – Test	Result - Remark	Verdict
(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
(15.5.1)	Terminals internal wiring		N
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples).....:		N
(15.5.1.2)	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 external wiring		N
	Terminal size and rating		N
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N)		N
	Pull test pin or tab terminals (4 samples); pull (N)		N



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

(15.6.3.1)		TABLE: Contact resistance test									N
		Voltage drop (mV) after 1 h									—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)										N	
		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)										N	
		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)										N	
		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)										N	
		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)										N	
										N	
Supplementary information:											



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

	CENELEC COMMON MODIFICATIONS (EN)		—
--	--	--	---

4.5 (3)	MARKING		—
7.5 (3.3.101)	Adequate warning on the package		N

4.6 (4)	CONSTRUCTION		—
(-)	IP X3 or better		N
	Degree of protection with/without plug		P
	Plug system according to regional or national standard		P

4.10 (5)	EXTERNAL AND INTERNAL WIRING		—
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 HD21 S2 or HD22 S2		P

ZB	ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)		—
(3.3)	DK: power supply cord with label		N
	IT: warning label on Class 0 luminaire		N
(4.5.1)	DK: socket-outlets		N
(5.2.1)	CY, DK, FI, SE, GB: type of plug		N

ZC	ANNEX ZC, NATIONAL DEVIATIONS (EN)		—
(4 & 5)	FR: Shuttered socket-outlets 10/16A		N
(13.3)	DK: Needle flame test during 30 s		N
(13.3)	GB: Requirements according to United Kingdom Building Regulation		N
(13.3.2)	FR: Glow-wire test 850°C alt. 750°C for luminaires in premises open to public or 960°C for luminaires in emergency exits		N



EN 62493			
Clause	Requirement – Test	Result - Remark	Verdict

ANNEX 5	Assessment Of Lighting Equipment Related To Human Exposure To Electromagnetic Fields according to standard EN 62493:2010		P
----------------	---	--	----------

4.2	Application of limits (Test summary)		P
	Specific absorption rate (SAR)		P
a)	CISPR 15 clause 4.3.1 Disturbance voltage mains terminals 20 kHz to 30 MHz	See EMC report approved also by waltek (report No. WTD15S0730643E)	P
b)	CISPR 15 clause 4.4 Radiated electromagnetic disturbances 100 kHz to 30 MHz	See EMC report approved also by waltek (report No. WTD15S0730643E)	P
c)	CISPR 15 clause 4.4.2 Radiated electromagnetic disturbances 30MHz to 300MHz	See EMC report approved also by waltek (report No. WTD15S0730643E)	P
	Induced current density		P
d)	Induced current density 20 kHz - 10 MHz		P

4.2.d	INDUCED CURRENT DENSITY		P
-------	-------------------------	--	---

	Power supply system utilized:		—
	Voltage	230VAC	—
	Frequency	50Hz	—
	Environmental conditions:		—
	Temperature.....	23.4°C	—
	Humidity.....	55%	—
	EuT operation mode:		—
	☒ Normal operation	Lighting	—
	☐ Other operation:		—
			—

4.2.d	MEASUREMENT RESULTS				P
	Measuring with “Van der Hoofden” test head				
Location of EUT	Test model	Measuring distance	Result(F)	Limit(F)	Verdict
Around the EUT	FL1089E-2(49150003/01)	50cm	0.101	0.85	P



EN 62493			
Clause	Requirement – Test	Result - Remark	Verdict
4.3	Lighting equipment deemed to comply without testing		N
	Lighting equipment without electronic control gear is deemed to comply with the requirements of the standard without testing. All kind of ignitors, starters, switches, dimmers (including phase control units e.g. triac, GTO) and sensors are not considered as electronic control gear.		N



WALTEK



EN 62031			
Clause	Requirement – Test	Result - Remark	Verdict
ANNEX 6	LED modules for general lighting – Safety specifications EN 62031:2008+A1:2013		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
6	CLASSIFICATION		P
	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.		P
13	FAULT CONDITIONS		P
13.1	In compliance with IEC 61347-1 (clause numbers between parentheses refer to IEC 61347-1)		P
	When operated under fault conditions the LED-module:		P
	- does not emit flames or molten material		P
	- does not produce flammable gases		P
	- protection against accidental contact not impaired		P
	Thermally protected controlgear does not exceed the marked temperature value		N
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected		N
- (14.1)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (except between live parts and accessible metal parts)		N
	Distances on printed boards provided with coating according to IEC 60664-3		N
- (14.2)	Short-circuit or interruption of semiconductor devices	LED	P
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile		N
- (14.4)	Short-circuit across electrolytic capacitors		N
- (14.5)	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P



EN 62031			
Clause	Requirement – Test	Result - Remark	Verdict
	After the tests the insulation resistance with d.c. 500 V (M Ω) are ≥ 1 M Ω	100M Ω	P
	Temperature declared thermally protected LED-modules fulfil the requirements in Annex C of IEC 61437-1		N
13.2	Module withstands overpower condition >15 min.	1.5 times power	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
A	ANNEX A - TESTS		P
	All tests performed in accordance with the advice given in Annex H of IEC 61347-1, if applicable		P

WALTEK



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

	Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules IEC/EN 61347-2-13:2006		P
--	--	--	----------

4 (4)	GENERAL REQUIREMENTS		P
	Insulation materials according requirements in Annex N of IEC 61347-1	(see Annex N)	N
	Compliance of independent controlgear enclosure with IEC 60598-1		N
	Built-in magnetic ballast with double or reinforced insulation comply with Annex I of IEC 61347-1		N
	Built-in electronic controlgear with double or reinforced insulation comply with Annex O of IEC 61347-1	(see Annex O)	N
	SELV controlgear comply with Annex L of IEC 61347-1	(see Annex L)	N
	Independent SELV controlgear comply with Annex I of this part 2	(see Annex I)	N

6 (6)	CLASSIFICATION		P
	Independent controlgear.....:	Yes ☐ No ☒	—
	Built-in controlgear	Yes ☐ No ☒	—
	Integral controlgear	Yes ☒ No ☐	—
	SELV-equivalent or isolating controlgear	Yes ☐ No ☒	—
	Auto-wound controlgear	Yes ☐ No ☒	—
	Independent SELV controlgear	Yes ☐ No ☒	—

7	MARKING		N
7.1 (7.1)	Mandatory markings:		N
	a) mark of origin		N
	b) model number, type reference		N
	c) symbol for independent controlgear, if applicable		N
	d) correlation between interchangeable parts and controlgear marked		N
	e) rated supply voltage (V)		N
	supply frequency (Hz)		N
	supply current (A)		N
	f) earthing symbol		N
	k) wiring diagram		N
	l) value of t_c		N



EN 61347-2-13			
Clause	Requirement – Test	Result - Remark	Verdict
	m) symbol for declared temperature		N
	Constant voltage type:	Yes ☐ No ☐	—
	- rated output voltage (V)		N
	Constant current type:	Yes ☐ No ☐	—
	- rated output current (A)		N
	- rated maximum output voltage (V)		N
	- indication if for LED modules only		N
7.2 (7.1)	Information to be provided, if applicable:		N
	h) declaration on protection against accidental contact		N
	i) cross-section of conductors (mm ²)		N
	j) number, type and wattage of lamp(s)		N
	- directly mains-connected windings		N
	- SELV-equivalent controlgear		N
- (7.2)	Marking durable and legible		N
	Rubbing 15 s water, 15 s petroleum; marking legible		N

8 (10)	PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS		P
- (10.1)	Controlgear protected against accidental contact with live parts		N
- (A2)	Voltage measured with 50 k Ω		N
- (A3)	Voltage > 35 V r.m.s. or > 60 V d.c. or protective impedance device	--	N
	Lacquer or enamel not used for protection or insulation	No such material used	P
	Adequate mechanical strength on parts providing protection		P
- (10.2)	Capacitors > 0,5 F: voltage after 1 min (V): < 50 V	4V after 1min	P
- (10.3)	Controlgear providing SELV		N
	Accessible conductive parts are insulated from live parts by double or reinforced insulation in SELV controlgear		N
	No connection between output circuit and the body or protective earthing circuit		N
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		N
	SELV outputs separated by at least basic insulation		N
	ELV conductive parts insulated as live parts		N
	Tests according Annex L of IEC 61347-1		N



EN 61347-2-13			
Clause	Requirement – Test	Result - Remark	Verdict
- (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		N
	Y1 or Y2 capacitors comply with IEC 60384-14		N
	Resistors comply with test (a) in 14.1 of IEC 60065		N
8.1 (-)	SELV-equivalent controlgear accessible parts are insulated from live parts by double or reinforced insulation according 8.6 and 13.1 in IEC 60065		N
8.2 (-)	Exposed terminals of SELV or SELV-equivalent controlgear are allowed if: - the rated or maximum output voltage does not exceeding 25 V r.m.s. - the no-load output voltage does not exceed 30 V r.m.s. or $33\sqrt{2}$ V peak		N
	Insulated terminals if rated output voltage > 25 V		N
	One capacitor Y1 or two capacitors Y2 complying with IEC 60384-14 of the same values used in series between SELV or SELV-equivalent output and primary circuits		N
	Other components bridging the separating transformer complying with IEC 60065, clause 14		N

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

10 (9)	PROVISION FOR EARTHING		N
- (9.1)	Provisions for protective earthing		N



EN 61347-2-13			
Clause	Requirement – Test	Result - Remark	Verdict
	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
	Earthing via means of fixing		N
	Earthing terminal only used for the earthing of the control gear		N
	All parts of material minimizing the danger of electrolytic corrosion		N
	Made of brass or equivalent material		N
	Contact surface bare metal		N
- (9.2)	Provision for functional earthing		N
	Comply with clause 8 and 9.1		N
- (9.3)	Earth contact via the track on the printed board		N
	Test with a current of 25 A between earthing terminal and each of the accessible metal parts; measured resistance (Ω) at ≥ 10 A according 7.2.3 of IEC 60598-1: $< 0,5 \Omega$:		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 mm ² and of copper or equivalent		N
	Protective earthing wires in line with 5.3.1.1 and clause 7		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 and each of the accessible metal parts at ≥ 10 A according 7.2.3 of IEC 60598-1: $< 0,5 \Omega$:		N
	Output earthing terminal marked as in 7.1 t) of IEC 61347-1		N

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 (MQ):	P



EN 61347-2-13			
Clause	Requirement – Test	Result - Remark	Verdict
	For basic insulation $\geq 2 \text{ M}\Omega$	Between L & N (remove fuse): $100 \text{ M}\Omega$	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	See Annex L	N
11 (-)	Adequate insulation between input and output terminals not bounded together in SELV-equivalent controlgear		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		P
	Working voltage > 50 V $\leq 1000 \text{ V}$, test voltage (V):		P
	Basic insulation, $2U+1000 \text{ V}$	Between L & N (remove fuse): 1460 V	P
	Supplementary insulation, $2U+ 1000 \text{ V}$		N
	Reinforced insulation, test voltage (V): $4U+ 2000 \text{ V}$		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	See Annex N	N
12 (-)	Windings in separating transformers in SELV-equivalent control gear according to 14.3.2 of EN 60065		N

13 (13)	THERMAL ENDURANCE FOR WINDINGS (Not applicable)		—
----------------	--	--	---

14 (14)	FAULT CONDITIONS		P
	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 14)	P



EN 61347-2-13			
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)		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 14)	P
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile	No such materials	N
- (14.4)	Short-circuit across electrolytic capacitors	(see appended table 14)	P
- (14.5)	After the tests has been carried out on three samples:		P
	The insulation resistance $\geq 1 \text{ M}\Omega$		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 (-)	Temperature declared thermally protected controlgear fulfil the requirements in Annex C	Not thermally protected controlgear.	N
- (14.6)	Relevant fault condition tests with high-power supply		P
15 (-)	TRANSFORMER HEATING		P
	Windings of separating transformer in a SELV-equivalent controlgear fulfil the requirements according to 7.1 and 11.2 of IEC 60065		N
15.1 (-)	Normal operation		P
	Temperatures do not exceed the changed values of the values in column 2 of Table 3 of IEC 60065, in respect to relevant ambient temperature at t_c , under normal operation	(see appended table)	P
15.2 (-)	Abnormal operation		P
	Temperatures do not exceed the changed values of the values in column 3 of Table 3 of IEC 60065, in respect to relevant ambient temperature at t_c , under abnormal conditions of Cl. 16 and fault conditions of Cl. 14		P
	Ambient temperature at t_c	(see appended table)	—
16	ABNORMAL CONDITIONS		P
	Safety not impaired when ballast is operated at any voltage between 90% and 110% of rated voltage		P
16.1 (-)	Control gear which are of the constant voltage output type:		—
	a) No LED module inserted	(see appended table 14)	P



EN 61347-2-13			
Clause	Requirement – Test	Result - Remark	Verdict
	b) Double LED modules or equivalent load connected to the output terminals	(see appended table 14)	P
	c) Output terminal short-circuited (20 cm and 200 cm or declared length)	(see appended table 14)	P
	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		P
16.2 (-)	Control gear which are of the constant current output type: See appended table		—
	a) No LED module connected		N
	b) Double the LED modules or equivalent load connected in series to the output terminals		N
	c) Output terminal short-circuited (20cm and 200cm or declared length)		N
	Maximum output voltage not exceeded		N
	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		N

17 (15)	CONSTRUCTION		P
17 (-)	Socket-outlet in the output circuit does not accept plugs complying with IEC 60083 and IEC 60906		N
	Not possible to engage plugs accepted by socket-outlet in the output circuit with socket-outlets complying with IEC 60083 and IEC 60906		N
- (15.1)	Wood, cotton, silk, paper and similar fibrous material		P
	Wood, cotton, silk, paper and similar fibrous material not used as insulation	No such part	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 $\leq 3\text{ A}$, $\leq 25\text{ V}$ r.m.s. or $\leq 60\text{ V d.c.}$ and $\leq 72\text{ W}$ 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



EN 61347-2-13			
Clause	Requirement – Test	Result - Remark	Verdict
	- socket-outlets without protective earth		N

18 (16)	CREEPAGE DISTANCES AND CLEARANCES		P
- (16)	Creepage distances and clearances according to Table 3 and 4, as appropriate	(see appended table)	P
	Controlgears providing SELV comply with L.1 in Annex L		N
	Insulating lining of metallic enclosures		N
	Basic insulation on printed boards tested according to clause 14		P
	Distances subjected to both sinusoidal voltage as non-sinusoidal pulses not less than value in either Table 3 or 4	(see appended table)	P
	Creepage distances not less than minimum clearance		P

19 (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
(4.11.2)	Screws:		N
	- self-tapping screws	No screws used	N
	- thread-cutting screws		N
	- at least two self-tapping screws		N
(4.11.3)	Screw locking:		N
	- spring washer		N
	- rivets		N
(4.11.4)	Material of current-carrying parts	Copper	P
(4.11.5)	No contact to wood		P
(4.11.6)	Electro-mechanical contact systems		N
(4.12)	Mechanical connections and glands:		N
(4.12.1)	Mechanical stress		N
	Screws not made of soft metal		N
	Screws of insulating material		N
	Torque test: part; torque (Nm)		N
(4.12.2)	Screw diameter < 3 mm screwed into metal		N
(4.12.3)	Void		—
(4.12.4)	Locked connections		N
(4.12.5)	Screwed glands: force (N)		N



EN 61347-2-13			
Clause	Requirement – Test	Result - Remark	Verdict
20 (18)	RESISTANCE TO HEAT, FIRE AND TRACKING		P
(18.1)	Parts of insulating material retaining live parts in position, ball-pressure test:		P
	- part; test temperature (°C,):	See clause 13 of EN60598-2-4	P
(18.2)	Printed boards in accordance with IEC 60249-1, 4.3		P
(18.3)	External parts of insulating material preventing electric shock glow-wire test 650 °C	See clause 13 of EN60598-2-4	P
(18.4)	Parts of insulating material retaining live parts in position, needle-flame test 10 s:		P
	- flame extinguished within 30 s		P
	- no flaming drops igniting tissue paper		P
(18.5)	Tracking test		N

21 (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

14	TABLE: tests of fault conditions			P
Part		Simulated fault	Description	Hazard
Charging mode				
Output to LED module		Shorted circuit	Unit shut down immediately, recoverable	No
Output to LED module		Open circuit	Unit shut down immediately, recoverable	No
Output to LED module		Double load	Unit shut down immediately, recoverable	No
BD1		Shorted circuit	Fuse opened immediately	No
R1		Shorted circuit	A lamp not lit immediately, unrecoverable	No
C1		Shorted circuit	A lamp not lit immediately, recoverable	No



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

18 (16)	TABLE: creepage distances and clearances				P
	Min. Cr. (mm)	Limit: Cr.(mm)	Min. Cl. (mm)	Limit: Cl.(mm)	
1. Between L and N (before fuse):	>3.0	2.5	>3.0	1.7	
2. Between pins of fuse:	>3.0	2.5	>3.0	1.7	

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		P
A.2	Voltage ≤ 35 V peak or ≤ 60 V d.c. :	See clause 8 in this Test Report	P
A.3	If voltage > 35 V r.m.s. or > 60 V d.c. or protective impedance device; touch current does not exceed 0,7 mA (peak) or 2 mA d.c. :		N
	Comply with Annex G of IEC 60598-1		P
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 controlgear, 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		N
	b) manual resetting type		N
	c) non-renewable, non-resetting type		N
	d) renewable, non-resetting type		N
	e) other type of thermal protection; description :		N
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



EN 61347-2-13			
Clause	Requirement – Test	Result - Remark	Verdict
	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		N
	Output of windings connected to the mains supply short-circuited, and other part of the controlgear operated under normal conditions		N
	Increasing of the current through the windings continuously until operation of the protection means		N
	Continuous measuring of the highest surface temperature		N
	Controlgear according to C5 a) or C5 e) operated until stable conditions are achieved		N
	Automatic-resetting thermal protectors working 3 times		N
	Controlgear according to C5 b) working 6 times		N
	Controlgear 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

E	ANNEX E – USE OF CONSTANT S OTHER THAN 4500 IN t_w TESTS		N
E1	Constant S claimed		N
	Claimed test method		N
E2	Procedure A		N
	Adequate data provided by the manufacturer		N
	The inverse of the slope is greater than or equal to the claimed value of S		N
	Compliance with the failure criteria for procedure B		N
E3	Procedure B		N
	Claimed value of T1		N
	Claimed value of T2		N
	Endurance test carried out at:		N



EN 61347-2-13			
Clause	Requirement – Test	Result - Remark	Verdict
	T1 (7 samples)		N
	T2 (7 samples)		N
	Duration of test calculated from equation (2)		N
	T1		N
	T2		N
	During the test: - No open circuit - No breakdown insulation		N
	The claimed constant S is deemed to be verified		N

F	ANNEX F - DRAUGHT-PROOF ENCLOSURE		P
	Draught-proof enclosure in accordance with the description		P
	Dimensions of the enclosure		P
	Other design; description		N

H	ANNEX H - TESTS		P
	All tests performed in accordance with the advise given in Annex H, if applicable		P

I	ANNEX I - PARTICULAR ADDITIONAL REQUIREMENTS FOR INDEPENDENT SELV D.C. OR A.C. SUPPLIED ELECTRONIC CONTROLGEAR FOR LED MODULES		N
I.3	Classification		—
I.3.1	Class I	Yes ☐ No ☐	—
	Class II	Yes ☐ No ☐	—
I.3.2	a) non-inherently short circuit proof controlgear	Yes ☐ No ☐	—
	b) non-inherently open circuit proof controlgear	Yes ☐ No ☐	—
	c) inherently short circuit proof controlgear	Yes ☐ No ☐	—
	d) inherently open circuit proof controlgear	Yes ☐ No ☐	—
	e) fail safe controlgear	Yes ☐ No ☐	—
	f) non-short-circuit proof controlgear	Yes ☐ No ☐	—
	g) non-open-circuit proof controlgear	Yes ☐ No ☐	—
I.4	Marking		N
	Adequate symbols are used		N
I.5	Protection against electric shock		N
I.5.1	No connection between output winding and body		N



EN 61347-2-13			
Clause	Requirement – Test	Result - Remark	Verdict
	No connection between output winding and protective earthing circuit		N
I.5.2	Input and output circuits electrically separated from each other		N
I.5.2.1	Insulation between input and output winding of the HF-transformer consists of double or reinforced insulation		N
	Class II: insulation between input/output and body consists of double or reinforced insulation		N
	Class I: insulation between input and body consists of basic and between output and body supplementary insulation		N
I.5.2.2	Insulation between input and output winding via the core consists of double or reinforced insulation		N
	Insulation between cord and windings of the HD-transformer consists of basic insulation		N
I.5.2.3	Serrated tape, additional layer		N
I.5.2.4	Class I controlgear for fixed connection provided with basic insulation plus protective screening comply with the following conditions:		N
	a) Insulation between the input winding and the protective screen complies with the requirements for basic insulation		N
	b) Insulation between the protective screen and the output winding complies with the requirements for basic insulation		N
	c) Metal screen consists of a metal foil or of a wire wound screen		N
	d) Metal screen so arranged that both edges cannot simultaneously touch a magnetic core		N
	e) Metal screen and its lead-out wire have a cross-section sufficient to ensure that an overload device will open the circuit before the screen is destroyed		N
	f) Lead-out wire sufficiently fixed to the metal screen		N
I.5.2.5	Last turn of each winding of the transformer retained by positive means		N
	Impregnated winding		N
	Winding held together by means of insulating material		N
I.5.3	Components bridging between input and output circuit		N
I.5.3.1	Used capacitors and resistors comply with 8.2		N
I.5.3.2	Used opto-couplers		N
I.6	Heating		N



EN 61347-2-13			
Clause	Requirement – Test	Result - Remark	Verdict
I.6.1	No excessive temperatures in normal use		N
	Used material classified as Class _____		
	Stated value of t_a _____		
I.6.2	Upri: 1.06 time supply rated voltage		
	Determined temperature rises in windings: - Primary: _____ K - Limit max: _____ K - Secondary: _____ K - Limit max: _____ K		N
	After the test:		N
	- no connections have worked loose		N
	- no reduction of creepage distances and clearances		N
	- no flow of sealing compound		N
	- no operation of protecting devices		N
	- electric strength test between input and output windings		N
I.6.3	Cycling test (10 cycles):		N
I.6.3.1	- heat run at _____ K		N
I.6.3.2	- moisture treatment 48 h		N
I.6.3.3	- vibration test 1 h; 1,5 g		N
I.6.3.4	After the tests:		N
	- insulation resistance		N
	- dielectric strength test at 35 % of specified value; test voltage _____ V		N
	- Current or the ohmic component does not deviates by more than 30 %		N
I.7	Short-circuit and overload protection		N
I.7.1	Upri: 1.06 times rated voltage or 0.94 and 1.06 times rated supply voltage - used voltage _____ V		N
I.7.2 I.7.3 I.7.4	Determined temperature rise in windings and on other parts:		N
	- test according to Clause I.7.3.1 to I.7.3.5		N
	- Primary winding _____ K		N
	- Limit max _____ K		N
	- Secondary winding _____ K		N
	- Limit max _____ K		N



EN 61347-2-13			
Clause	Requirement – Test	Result - Remark	Verdict
	- External enclosure ____ K		N
	- Limit max ____K		N
	- Rubber insulation of wiring _____ K		N
	- Limit max ____K		N
	- PVC insulation of wiring ____ K		N
	- Limit max ____ K		N
	- Supports ____ K		N
	- Limit max ____ K		N
I.7.5	Fail-safe convertors		N
I.7.5.1	- Upri: 1.06 times rated supply voltage V:		—
	- Isec: 1.5 times rated output current A:		—
	- time until steady-state conditions t1 (h) :		—
	- time until failure t2 (h): < t1; < 5 h :		N
I.7.5.2	During the test:		N
	- no flames, molten material, etc.		N
	- temperature rise of enclosure < 150 K		N
	- temperature rise of plywood support < 100 K		N
	After the test:		N
	- electric strength (test voltage; 35 % of specified value); no flashover or breakdown for primary-to-secondary and for primary-to-body		N
	- live parts not accessible by test finger through holes of enclosure		N
I.8	Insulation resistance and electric strength		N
I.8.1	Conditioned 48 h between 91 % and 95 %		N
I.8.2	Adequate insulation (500 V d.c. for 1 min) between:		N
	Live parts and the body -for basic insulation not less than 2 M		N
	Live parts and the body -for reinforced insulation not less than 4 M		N
	Input- and output circuits not less than 5 M		N
	Metal parts of class II controlgear which are separated from live parts by basic insulation only and the body not less than 5 M		N
	Metal foil in contact with the inner and outer surfaces of enclosures of insulating material not less than 2 M		N
I.8.3	Electric strength test:		N



EN 61347-2-13			
Clause	Requirement – Test	Result - Remark	Verdict
	1) Between live parts of input circuits and live parts of output circuits		N
	2) Over basic or supplementary insulation between:		N
	a) live parts which are or may become of different polarity		N
	b) live parts and enclosure if intended to be connected to protective earth		N
	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
	3) Over reinforced insulation between the body and live parts		N
	No flashover or breakdown occurred		N
I.9	Construction		N
I.9.1	Comply with all requirements		N
I.9.2	The distance between input and output terminals shall not be less than 25 mm		N
I.10	Components		N
I.10.1	Socket-outlets in the output circuit does not accept plugs complying with IEC 60083 and IEC 60906-1		N
I.10.2	Self-resetting devices shall not be used unless it is certain that there will be no hazards		N
	Compliance is checked by connecting the controlgear for 48 h at 1.06 times the rated voltage with the output short-circuited		N
I.11	Creepage distances and clearances		N
	1. Insulation between input and output circuits:		N
	a) measured values > specified values (mm)		N
	b) measured values > specified values (mm)		N
	c) measured values > specified values (mm)		N
	2. Insulation between adjacent input circuits: measured values > specified values (mm)		N
	2. Insulation between adjacent output circuits: measured values > specified values (mm)		N
	3. Insulation between terminals for external connection:		N
	a) measured values > specified values (mm)		N
	b) measured values > specified values (mm)		N
	c) measured values > specified values (mm)		N
	4. Basic or supplementary insulation:		N
	a) measured values > specified values (mm)		N



EN 61347-2-13			
Clause	Requirement – Test	Result - Remark	Verdict
	b) measured values > specified values (mm)		N
	c) measured values > specified values (mm)		N
	d) measured values > specified values (mm)		N
	e) measured values > specified values (mm)		N
	5. Reinforced insulation: measured values > specified values (mm)		N
	6. Distances through insulation:		N
	a) measured values > specified values (mm)		N
	b) measured values > specified values (mm)		N
	c) measured values > specified values (mm)		N
	d) measured values > specified values (mm)		N

L	ANNEX L: PARTICULAR ADDITIONAL REQUIREMENTS FOR CONTROLGEARS PROVIDING SELV (IEC 61347-1)		
L.3	Classification		
	Class I	Yes ☐ No ☐	—
	Class II	Yes ☐ No ☐	—
	Class III	Yes ☐ No ☐	—
	non-inherently short circuit proof controlgear	Yes ☐ No ☐	—
	inherently short circuit proof controlgear	Yes ☐ No ☐	—
	fail safe controlgear	Yes ☐ No ☐	—
	non-short-circuit proof controlgear	Yes ☐ No ☐	—
L.4	Marking		N
	Adequate symbols are used		N
L.5	Protection against electric shock		N
	Comply with 9.2 of IEC 61558-1		N
L.6	Heating		N
	No excessive temperatures in normal use		N
	Value if capacitor tc marked :	See Annex 1	—
	Winding insulation classified as Class :		—
	Comply with tests of clause 14 of IEC 61558-1 with adjustments		N
L.7	Short-circuit and overload protection		N
	Comply with tests of clause 15 of IEC 61558-1 with adjustments		N
L.8	Insulation resistance and electric strength		N
L.8.1	Conditioned 48 h between 91 % and 95 %		N



EN 61347-2-13			
Clause	Requirement – Test		Verdict
L.8.2	Insulation resistance		N
	Between input- and output circuits not less than 5 MΩ		N
	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		N
L.8.3	Electric strength		N
	1) Between live parts of input circuits and live parts of output circuits		N
	2) Over basic or supplementary insulation between:		N
	a) live parts having different polarity		N
	b) live parts and body if intended to be connected to protective earth		N
	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		N
L.9	Construction		N
L.9.1	Transformer comply with 19.12 of IEC 61558-1 and 19 of IEC 61558-2-6		N
	HF transformer comply with 19 of IEC 61558-2-16		N
L.10	Components		N
	Protective devices comply with 20.6 – 20.11 of IEC 61558-1		N
L.11	Creepage distances and clearances		N
	1. Insulation between input and output circuits, basic insulation:		N
	a) measured values > specified values (mm)		N
	b) measured values > specified values (mm)		N
	c) measured values > specified values (mm)		N
	2. Insulation between input and output circuits, double or reinforced insulation:		N
	a) measured values > specified values (mm)		N
	b) measured values > specified values (mm)		N
	c) measured values > specified values (mm)		N



EN 61347-2-13			
Clause	Requirement – Test		Verdict
	3. Insulation between adjacent input circuits		N
	- measured values > specified values (mm)		N
	3. Insulation between adjacent output circuits		N
	- measured values > specified values (mm)		N
	4. Insulation between terminals for external connection:		N
	- measured values > specified values (mm)		N
	5. Basic or supplementary insulation:		N
	a) measured values > specified values (mm)		N
	b) measured values > specified values (mm)		N
	c) measured values > specified values (mm)		N
	d) measured values > specified values (mm)		N
	e) measured values > specified values (mm)		N
	6. Reinforced insulation or insulation:		N
	Between the body and live parts or where it is required by the standard (mm)		N
	Between body and output circuit if provision against transient voltages: measured values > specified values (mm)		N
	7. Distance through insulation:		N
	a) measured values > specified values (mm)		N
	b) measured values > specified values (mm)		N
	c) measured values > specified values (mm)		N
N	ANNEX N: REQUIREMENTS FOR INSULATION MATERIALS USED FOR DOUBLE OR REINFORCED INSULATION (IEC 61347-1)		N
N.4	General requirements		N
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		N
N.4.3.1	Thickness and composition of thin sheet insulation		N
	- Inside the ballast and not subjected to handling or abrasion during the production and during maintenance		N



EN 61347-2-13			
Clause	Requirement – Test	Result - Remark	Verdict
	- Non-separated layers: Min. 3 layers and fulfil mandrel test of 150 N		N
	- Separated layers: Min. 2 layers and each layer fulfil mandrel test of 50 N		N
	- Separated layers (alternative): Min. 3 layers and 2/3 of the layers fulfil mandrel test of 100 N		N
N.4.3.2	Mandrel test (electric strength test during mechanical stress)		N
	Electric strength test after mandrel test:		N
	- 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		N
	- 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 (IEC 61347-1)		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
	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



EN 61347-2-13			
Clause	Requirement – Test	Result - Remark	Verdict
	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
O.18	Resistance to corrosion		N
	Clause 21 (19)	See clause 21	N
Annex I (EN 61347-1)	Additional requirements for built-in magnetic ballasts with double or reinforced insulation		N
Annex J	Schedule of more onerous requirement		N
Annex K	Conformity testing during manufacture		N



EN 62471			
Clause	Requirement – Test	Result - Remark	Verdict

Annex 6	Photobiological safety evaluated according to standard EN 62471:2008.	P
Emission limits for risk groups of continuous wave lamps (for model FL1089E-2(49150003/01)) (for big lamp part) α= 0.0569rad		P

Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	E_S	$\text{W}\cdot\text{m}^{-2}$	0.001	1.0e-04	-	-	-	-
Near UV		E_{UVA}	$\text{W}\cdot\text{m}^{-2}$	0.33	4.2e-05	-	-	-	-
Blue light	$B(\lambda)$	L_B	$\text{W}\cdot\text{m}^{-2}\cdot\text{sr}^{-1}$	100	2.0e+01	10000	-	400000	-
Bluelight, small source	$B(\lambda)$	E_B	$\text{W}\cdot\text{m}^{-2}$	0.01*	-	1.0	-	400	-
Retinal thermal	$R(\lambda)$	L_R	$\text{W}\cdot\text{m}^{-2}\cdot\text{sr}^{-1}$	28000/ α	6.5e+03	28000/ α	-	71000/ α	-
Retinal thermal, weak visual stimulus**	$R(\lambda)$	L_{IR}	$\text{W}\cdot\text{m}^{-2}\cdot\text{sr}^{-1}$	545000	-				
				0.0017 $\leq\alpha\leq$ 0.011	-				
IR radiation, eye		E_{IR}	$\text{W}\cdot\text{m}^{-2}$	6000/ α	-				
				0.011 $\leq\alpha\leq$ 0.1	-				
IR radiation, eye		E_{IR}	$\text{W}\cdot\text{m}^{-2}$	100	0.0e+00	570	-	3200	-

* Small source defined as one with $\alpha < 0.011$ radian. Averaging field of view at 10000 s is 0.1 radian.

** Involves evaluation of non-GLS source.

Assessment:

Lamp classification group..... exempt ☒ risk 1 ☐ risk 2 ☐ risk 3 ☐



EN 62471			
Clause	Requirement – Test	Result - Remark	Verdict

Annex 6		Photobiological safety evaluated according to standard EN 62471:2008.							P	
Emission limits for risk groups of continuous wave lamps (for model FL1089E-2(49150003/01)) (for small lamp part)									P	
$\alpha = 0.0163\text{rad}$										
Risk	Action spectrum	Symbol	Units	Emission Measurement						
				Exempt		Low risk		Mod risk		
				Limit	Result	Limit	Result	Limit	Result	
Actinic UV	$S_{UV}(\lambda)$	E_S	$\text{W}\cdot\text{m}^{-2}$	0.001	1.6e-04	-	-	-	-	
Near UV		E_{UVA}	$\text{W}\cdot\text{m}^{-2}$	0.33	6.0e-06	-	-	-	-	
Blue light	$B(\lambda)$	L_B	$\text{W}\cdot\text{m}^{-2}\cdot\text{sr}^{-1}$	100	2.9e+01	10000	-	4000000	-	
Bluelight, small source	$B(\lambda)$	E_B	$\text{W}\cdot\text{m}^{-2}$	0.01*	-	1.0	-	400	-	
Retinal thermal	$R(\lambda)$	L_R	$\text{W}\cdot\text{m}^{-2}\cdot\text{sr}^{-1}$	28000/ α	1.2e+04	28000/ α	-	71000/ α	-	
Retinal thermal, weak visual stimulus**	$R(\lambda)$	L_{IR}	$\text{W}\cdot\text{m}^{-2}\cdot\text{sr}^{-1}$	545000 0.0017 $\leq\alpha\leq$ 0.011	-					
				6000/ α 0.011 $\leq\alpha\leq$ 0.1	-					
IR radiation, eye		E_{IR}	$\text{W}\cdot\text{m}^{-2}$	100	0.0e+00	570	-	3200	-	
* Small source defined as one with $\alpha<0.011$ radian. Averaging field of view at 10000 s is 0.1 radian.										
** Involves evaluation of non-GLS source.										
Assessment:										
Lamp classification group..... exempt ☒ risk 1 ☐ risk 2 ☐ risk 3 ☐										

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



Page 1 of 5

Photo Documentation

Reference No.: WTD15D0730387S

Model: FL1089E-2(49150003/01)



Photo 1



Photo 2



Photo Documentation

Reference No.: WTD15D0730387S

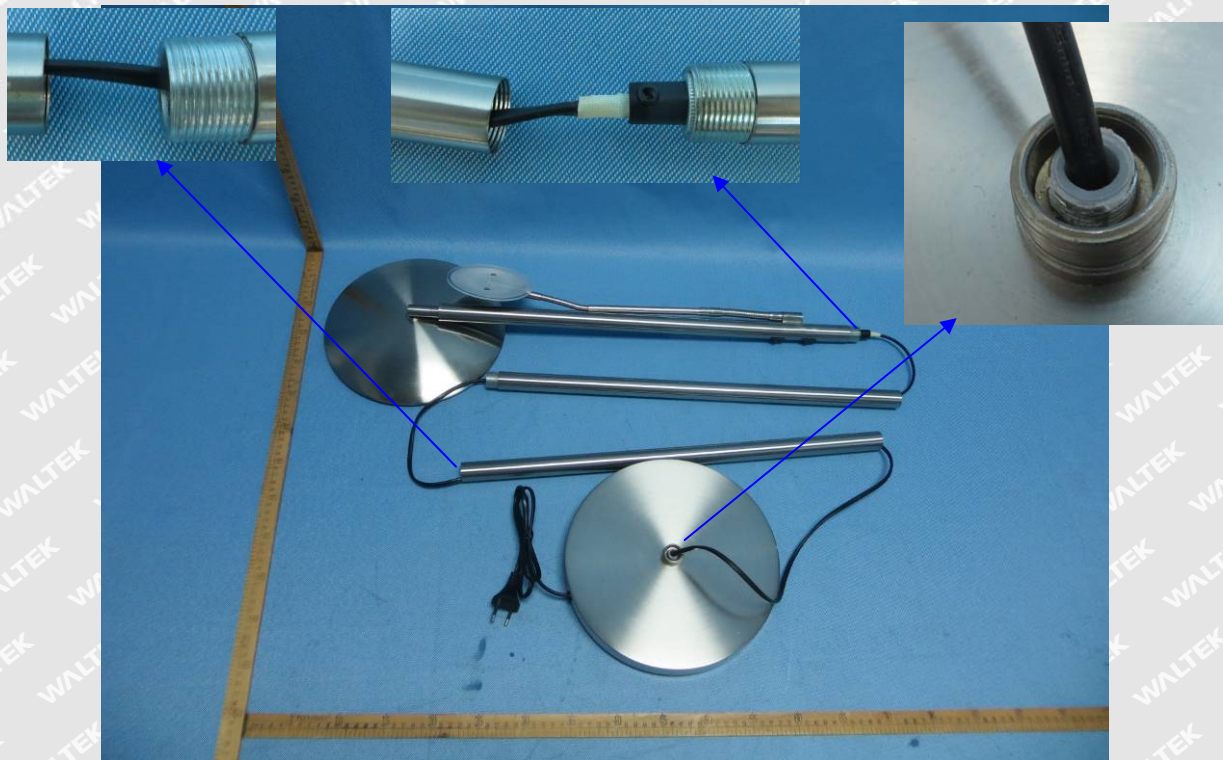


Photo 3



Photo 4



Photo Documentation

Reference No.: WTD15D0730387S



Photo 5

Photo 5

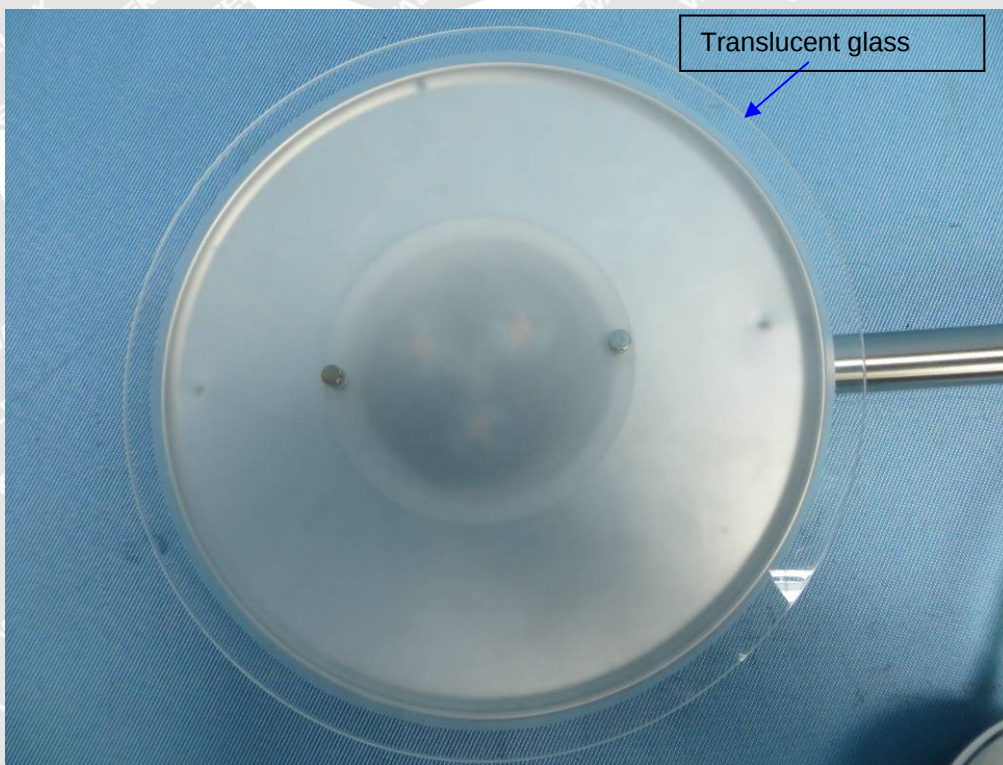
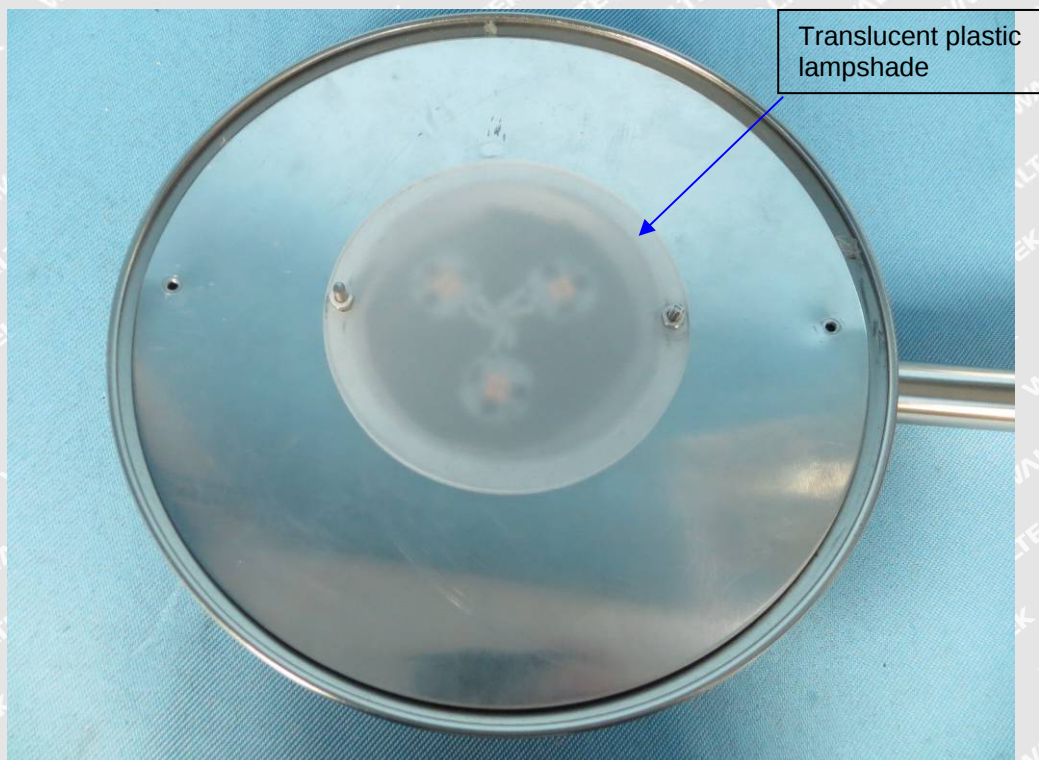


Photo 6



Photo Documentation

Reference No.: WTD15D0730387S



Translucent plastic
lampshade

Photo 7



Photo 8



Photo Documentation

Reference No.: WTD15D0730387S

Translucent plastic
lampshade

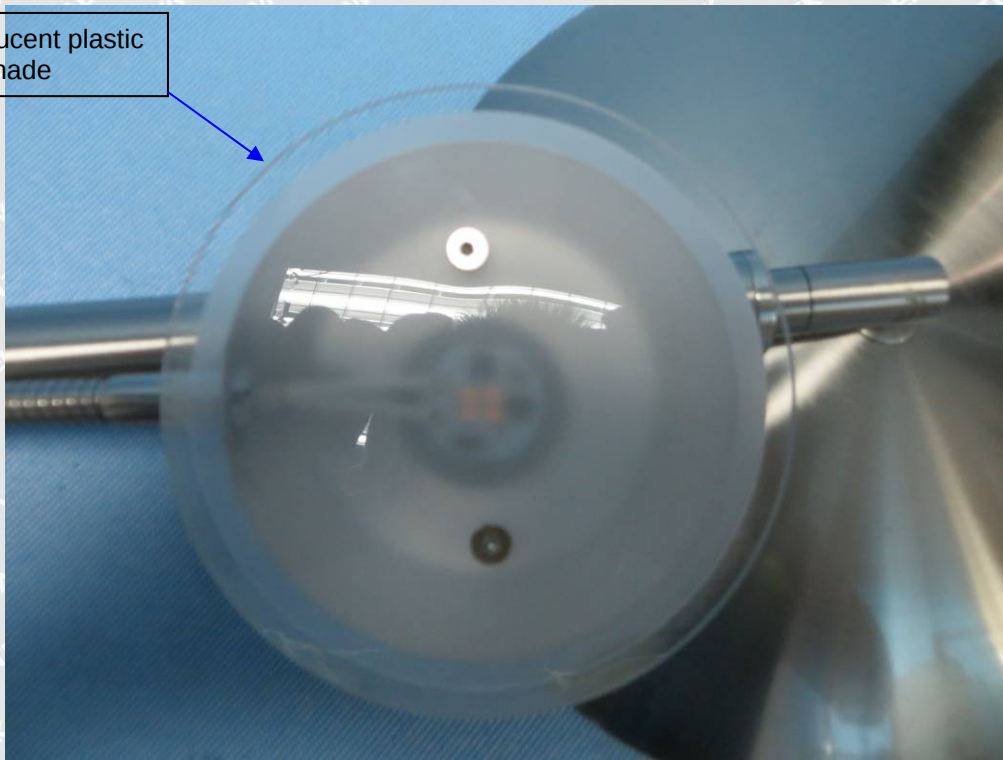


Photo 9

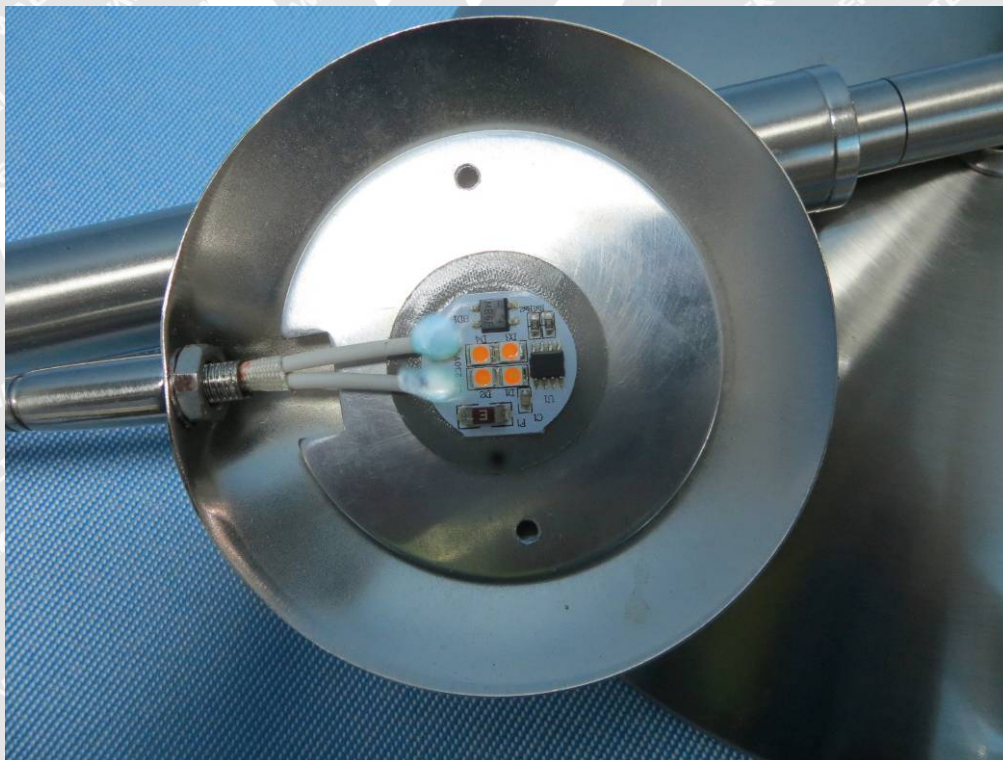


Photo 10