



中国认可
国际互认
检测 TEST REPORT
IEC 60598-2-3
CNAS L4595
Luminaires

Part 2: Particular requirements
Section Three – Luminaires for road and street lighting

Report reference No.....: LCS1604110781S

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Contents: 35 pages



Testing laboratory

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Address: 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China

Testing location: As above

Client

Name: MAGNIZON POWER SYSTEMS FZE

Address: JAFZA LOB11, 1st Floor, Office 32, Jebel Ali Free Zone, Dubai-UAE

Manufacturer

Name: MAGNIZON POWER SYSTEMS FZE

Address: JAFZA LOB11, 1st Floor, Office 32, Jebel Ali Free Zone, Dubai-UAE

Test specification

Standard.....: IEC 60598-2-3: 2002+A1: 2011(see also IEC 60598-1: 2008);
IEC 62031: 2008+A1: 2012; IEC 62493: 2009

Test procedure: Compliance with IEC 60598-2-3: 2002+A1: 2011(see also IEC 60598-1: 2008); IEC 62031: 2008+A1: 2012; IEC 62493: 2009

Non-standard test method: N/A

Test item Description.....: Solar Street Light

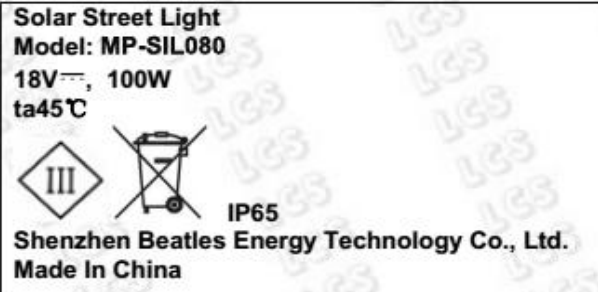
Trademark: N/A

Model and/or type reference: MP-SIL008, MP-SIL012, MP-SIL015, MP-SIL020, MP-SIL025,
MP-SIL030, MP-SIL040, MP-SIL050, MP-SIL060, MP-SIL070,
MP-SIL080, MP-SIL100, MP-SIL120

Rating(s): 18V^{max}, Max.120W

<p>Test item particulars</p> <p>Classification of installation and use.....: Class III</p> <p>Supply Connect: DC Supply leads</p>
<p>Possible test case verdicts</p> <p>Test case does not apply to the test object : N(N/A)</p> <p>Test item does meet the requirement: P(Pass)</p> <p>Test item does not meet the requirement ..: F(Fail)</p>
<p>Testing</p> <p>Date of receipt of test item: April 01, 2016</p> <p>Date(s) of performance of test: April 01, 2016 – April 12, 2016</p>
<p>General remarks</p> <p>This report shall not be reproduced except in full without the written approval of the testing laboratory.</p> <p>The test results presented in this report relate only to the item tested.</p> <p>Clause numbers between brackets refer to clauses in IEC 60598-1 (EN 60598-1).</p> <p>"(see remark #)" refers to a remark appended to the report.</p> <p>"(see Annex #)" refers to an annex appended to the report.</p> <p>Throughout this report a comma is used as the decimal separator.</p>
<p>General product information:</p> <ol style="list-style-type: none"> 1. Max. ambient temperature: 45°C 2. All models are similar except their appearance and model designation, and all tests were conducted on the model MP-SIL080 3. The test report includes: Attachment 1: Report of IEC 62031. Attachment 2: 12 pages of product photos.

Copy of marking plate(s)



IEC 60598-2-3			
Clause	Requirement – Test	Result - Remark	Verdict
3.1 (0)	SCOPE		---
3.1 (0.2)	More sections applicable	Yes [<input checked="" type="checkbox"/>] No [<input type="checkbox"/>]	P
3.4 (2)	CLASSIFICATION		---
3.4 (2.2)	Type of protection	Class III	P
3.4 (2.3)	Degree of protection	IP65	P
3.4 (2.4)	Portable and handheld luminaire	Road lamp	N
	Fixed luminaire suitable for normally flammable surfaces	Yes	P
	Fixed luminaire suitable for non-combustible materials only	No	N
3.4 (2.5)	Luminaire for normal use	Yes	P
	Luminaire for rough service	No	N
3.5 (3)	MARKING		P
3.5 (3.2)	Mandatory markings	See marking label of page 3	P
	Position of the marking	Affixed on surface of the enclosure	P
	Format of symbols/text	See marking label of page 3	P
3.5 (3.3)	Additional information		P
	Language of instructions	In English	P
3.5 (3.3.1)	Combination luminaires	Not combination luminaire	N
3.5 (3.3.2)	Nominal frequency in Hz		N
3.5 (3.3.3)	Operating temperature	Operating temperature is 45°C	P
3.5 (3.3.4)	Symbol or warning notice	No such warning notice	N
3.5 (3.3.5)	Wiring diagram	See annex user instruction	P
3.5 (3.3.6)	Special conditions	Not intend for looping-in	N
3.5 (3.3.7)	Metal halid lamp luminaire – warning		N
3.5 (3.3.8)	Limitation for semi-luminaires		N
3.5 (3.3.9)	Power factor and supply current		N
3.5 (3.3.10)	Suitability for use indoors	Outdoors	N
3.5 (3.3.11)	Luminaires with remote control	No remote control	N
3.5 (3.3.12)	Clip-mounted luminaire - warning		N
3.5 (3.3.13)	Specifications of protective shields		P
3.5 (3.3.14)	Symbol for nature of supply	---	P
3.5 (3.3.15)	Rated current of socket outlet	No socket outlet	N
3.5 (3.3.16)	Rough service luminaire	Normal use luminaire	N

IEC 60598-2-3			
Clause	Requirement – Test	Result - Remark	Verdict
3.5 (3.3.17)	Replacement cord, type X attachment		N
	Replacement cord, type Y attachment		N
	Replacement cord, type Z attachment	Type Z attachment	P
3.5 (3.3.18)	Non-ordinary luminaires with PVC cable		P
3.5 (-)	All relevant information provided on the instruction leaflet	No such terminal block	N
3.5 (3.4)	Test of marking		P
	Test with water	15s	P
	Test with hexane	15s	P
	Legible after test	Yes	P
	Label attached	Yes	P
3.6 (4)	CONSTRUCTION		P
3.6.1 (-)	At least IP X3	IP65	P
3.6.2 (-)	Suspension on span wires		N
3.6.3 (-)	Fixing device		P
3.6.3.1 (-)	Static load test	19.68kg	P
	-drag coefficient	1.2	P
	-loaded area.....m ²	0.29x0.30	P
	-used load	129.5N	P
	-measured deformation..... cm/m	<2cm/m	P
	-no rotation		P
3.6.4 (-)	Adjustable lampholders	No such parts	N
3.6.5 (-)	Glass cover		N
	- means of protection		N
	- number of particles		N
3.6 (4.2)	Components replaceable without difficulty	Can not replaceable without tool	N
3.6 (4.3)	Wireways smooth and free from sharp edges		P
3.6 (4.4)	Lampholders		N
3.6 (4.4.1)	Integral lampholder	No integral lampholder	N
3.6 (4.4.2)	Wiring connection		N
3.6 (4.4.3)	Lampholder for end-to-end mounting	No tubular fluorescent lampholder	N
3.6 (4.4.4)	Positioning		N
3.6 (4.4.5)	Peak pulse voltage	No ignitors	N

IEC 60598-2-3			
Clause	Requirement – Test	Result - Remark	Verdict
3.6 (4.4.6)	Centre contact	No ignitors	N
3.6 (4.4.7)	Rough service luminaires	Not for rough service	N
3.6 (4.4.8)	Lamp connectors	No lamp connector	N
4.6 (4.4.9)	Caps or bases		N
3.6 (4.5)	Starter holders (No starter holder)		---
	Starter holder in luminaires other than class II		N
	Starter holder class II construction		N
3.6 (4.6)	Terminal blocks		---
	Tails		N
	Unsecured blocks		N
3.6 (4.7)	Terminals and supply connections		--
3.6 (4.7.1)	Contact to metal parts		N
3.6 (4.7.2)	Location stranded wires		N
	8 mm test live conductor		N
	8 mm test earth conductor		N
3.6 (4.7.3)	Terminals for supply conductors		N
3.6 (4.7.4)	Terminals other than supply connection	No such terminals	N
3.6 (4.7.5)	Heat-resistant wiring/sleeves		P
3.6 (4.7.6)	Multi-pole plug	No plug	N
3.6 (4.8)	Switches:		---
	- adequate rating	No switch	N
	- adequate fixing		N
	- polarized supply		N
3.6 (4.9)	Insulating lining and sleeves		---
3.6 (4.9.1)	Retainment		P
	Method of fixing.....:		P
3.6 (4.9.2)	Insulated linings and sleeves		---
	a) & c) Insulation resistance and electric strength		P
	b) Ageing test. Temperature (°C).....:		N
3.6 (4.10)	Insulation of Class II luminaires		---
3.6 (4.10.1)	No contact, mounting surface - accessible metal parts - wiring of basic insulation	Class III luminaires	N
	Safe installation fixed luminaires		N
	Capacitors		N

IEC 60598-2-3			
Clause	Requirement – Test	Result - Remark	Verdict
	Interference suppression capacitors according to IEC 60384-14		N
3.6 (4.10.2)	Assembly gaps:		N
	- not coincidental		N
	- no straight access with test probe		N
	- degree of protection		N
3.6 (4.10.3)	Retainment of insulation:		---
	- fixed		N
	- unable to be replaced; luminaire inoperative		N
	- sleeves retained in position		N
	- lining in lampholder		N
3.6 (4.11)	Electrical connections		---
3.6 (4.11.1)	Contact pressure	No pressure transmitted to the insulating material	N
3.6 (4.11.2)	Screws:		P
	- spaced threaded screws		P
	- thread-cutting screws		N
	- at least two self-tapping screws		N
3.6 (4.11.3)	Screw locking:		P
	- spring washer		P
	- rivets	No rivet provided	N
3.6 (4.11.4)	Material of current-carrying parts	>50% copper	P
3.6 (4.11.5)	No contact to wood		P
3.6 (4.11.6)	Electro-mechanical contact systems	No such construction	N
3.6 (4.12)	Mechanical connections and glands		---
3.6 (4.12.1)	Screw not made of soft metal		P
	Screws of insulating material		N
	Torque test: torque (Nm); part	Fix metal enclosure: 4.8mm, 2Nm	P
	Torque test: torque (Nm); part	Fix metal enclosure: 7.1mm, 8Nm	P
3.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N
3.6 (4.12.4)	Locked connections:		---
	- fixed arms; torque (Nm).....	2.5 Nm	P
	- lampholder; torque (Nm).....	No lampholder	N

IEC 60598-2-3			
Clause	Requirement – Test	Result - Remark	Verdict
	- push-button switches; torque (0.8Nm)	No such component	N
3.6 (4.12.5)	Screwed glands; force (N)	No such glands	N
3.6 (4.13)	Mechanical strength		---
3.6 (4.13.1)	Impact tests:		---
	- fragile parts; energy (Nm)	0.5Nm for glasses enclosure	P
	- other parts; energy (Nm)	0.7Nm for metal enclosure	P
	1) live parts	Not accessible	P
	2) linings	No linings provided	N
	3) protection	IP65	P
	4) covers	No such covers	N
3.6 (4.13.2)	Metal parts enclosing live parts shall have adequate mechanical strength		P
3.6 (4.13.3)	Straight test finger	30N	P
3.6 (4.13.4)	Rough service luminaires		---
	a) fixed	Normal service luminaires	N
	b) hand-held		N
	c) delivered with a stand		N
	d) for temporary installations and suitable for mounting on a stand		N
3.6 (4.13.6)	Tumbling barrel		N
3.6 (4.14)	Suspensions and adjusting devices (No such devices)		N
3.6 (4.14.1)	Mechanical load:		P
	A) four times the weight	4x19.68kg	P
	B) torque 2,5 Nm		P
	C) bracket arm; force (N)	40N, 1minute	P
	D) load track-mounted luminaires		N
	E) clip-mounted luminaires, glass-shelve. Thickness (mm)		N
	metal rod. diameter (mm)		N
3.6 (4.14.2)	Load to flexible cables		---
	Mass (kg)		N
	Stress in conductors (N/mm ²)		N
	Mass (kg) of semi-luminaire.....		N
	Bending moment (Nm) of semi-luminaire ...		N
3.6 (4.14.3)	Adjusting devices:		---
	- rotating test; number of cycles.....		N

IEC 60598-2-3			
Clause	Requirement – Test	Result - Remark	Verdict
	- strands broken		N
	- electric strength test afterwards		N
3.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N
3.6 (4.14.5)	Guide pulleys		N
3.6 (4.14.6)	Strain on socket-outlets		N
3.6 (4.15)	Flammable materials:		P
	- glow-wire test 650 °C		P
	- spacing \geq 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
3.6 (4.15.2)	Luminaires made of thermoplastic material		---
	a) construction	Metal enclosure	N
	b) temperature sensing control		N
	c) surface temperature		N
3.6 (4.16)	Luminaires marked with "F" symbol		P
	No lamp control gear		N
3.6 (4.16.1)	Lamp control gear spacing:		N
	- spacing 35 mm		N
	- spacing 10 mm		N
3.6 (4.16.2)	Thermal protection:		---
	- in lamp control gear	No such component	N
	- external		N
	- fixed position		N
	- temperature marked lamp control gear		N
3.6 (4.16.3)	"F" curve measured		N
3.6 (4.17)	Drain holes	No such constructions	N
	Clearance at least 5 mm		N
3.6 (4.18)	Resistance to corrosion:		---
3.6 (4.18.1)	- rust-resistance		N
3.6 (4.18.2)	- season cracking in copper		N
3.6 (4.18.3)	- corrosion of aluminium		N

IEC 60598-2-3			
Clause	Requirement – Test	Result - Remark	Verdict
3.6 (4.19)	Igniters compatible with ballast	No igniters	N
3.6 (4.20)	Rough service vibration	No such appliance	N
3.6 (4.21)	Protective shield:	(No such protective shield)	---
3.6 (4.21.1)	Shield fitted		N
3.6 (4.21.2)	Particles from a shattering lamp not impair safety		N
3.6 (4.21.3)	No direct path		N
3.6 (4.21.4)	Impact test on shield		N
	Glow-wire test on lamp compartment		N
3.6 (4.22)	Attachments to lamps		N
3.6 (4.23)	Semi-luminaires comply Class II		N
3.6 (4.24)	UV radiation, metal halide lamps		N
3.6 (4.25)	No sharp point or edges	No sharp points or edges	P
3.6 (4.26)	Short-circuit protection:		---
3.6 (4.26.1)	Uninsulated accessible SELV parts		N
3.6 (4.26.2)	Short-circuit test		N
3.6 (4.26.3)	Test chain according to IEC 61032		N
3.7 (11)	CREEPAGE DISTANCES AND CLEARANCES		N
	Working voltage (V)	18Vdc	N
	Voltage form	Sinusoidal [] Non-sinusoidal [√]	N
	PTI	< 600 [√] ≥ 600 []	N
	Rated pulse voltage (kV)		N
	(1) Current-carrying parts of different polarity: cr (mm); cl (mm).....		N
	(2) current-carrying parts and accessible parts: cr (mm); cl (mm)		N
	(3) Parts becoming live due to breakdown of basic insulation and metal parts: cr (mm); cl (mm).....		N
	(4) Outer surface of cable where it is clamped and metal parts: cr (mm); cl (mm)		N
	(5) Current-carrying parts of switches and metal parts, after removal of insulation: cr (mm); cl (mm).....		N
	(6) Current-carrying parts and supporting surface: cr (mm); cl (mm)		N

IEC 60598-2-3			
Clause	Requirement – Test	Result - Remark	Verdict
3.8 (7)	PROVISION FOR EARTHING		N
3.8 (7.2.1 + 7.2.3)	Accessible metal parts		N
	Metal parts and supporting surface		N
	Resistance < 0,5 Ω		N
	Two spaced threaded screws used		N
	Thread-forming screws		N
	Connector earthing first		N
3.8 (7.2.2 + 7.2.3)	Earth continuity in joints etc		N
3.8 (7.2.4)	Locking of clamping means	No such parts	N
	Compliance with 4.7.3	Screw terminal	N
3.8 (7.2.5)	Earth terminal integral part of connector socket		N
3.8 (7.2.6)	Earth terminal adjacent to mains terminals		N
4.8 (7.2.7)	Electrolytic corrosion of the earth terminal	No such part	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
4.8 (7.2.11)	Earthing core coloured green-yellow		N
	Length of earth conductor		N
3.9 (14)	SCREW TERMINALS		N
3.9 (-)	Additional requirements		N
3.9 (14)	Separately approved; component list		N
	Part of the luminaire		N
3.9 (15)	SCREWLESS TERMINALS		N
	Separately approved; component list		N
	Part of the luminaire		N
3.10 (5)	EXTERNAL AND INTERNAL WIRING		P
3.10 (5.2)	Supply connection and external wiring		P
3.10 (5.2.1)	Means of connection	Supply leads	P
	Connecting leads:		P
	- without a means for connection to the supply		N

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Clause	Requirement – Test	Result - Remark	Verdict
	- 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
3.10 (5.2.2)	Type of cable	H05RN-F	P
	Nominal cross-sectional area (mm ²)	2X0.75mm ²	P
3.10 (5.2.3)	Type of attachment, X, Y or Z	Type Z	P
3.10 (5.2.5)	Type Z not connected to screw		N
3.10 (5.2.6)	Cable entries:		---
	- suitable for introduction		P
	- adequate degree of protection		P
3.10 (5.2.7)	Cable entries through rigid material have rounded edges		P
3.10 (5.2.8)	Insulating bushings:		---
	- suitably fixed		P
	- material in bushings		P
	- tubes or guards made of insulating material		P
3.10 (5.2.9)	Locking of bushings		N
3.10 (5.2.10)	Cord anchorage:		---
3.10.1 (-)	-additional requirements		P
3.10 (5.2.10)	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		P
	- no tying of cables into knots etc.		P
	- insulating material or lining		P
3.10 (5.2.10.1)	Cord anchorage for type X attachment cord	Not such construction	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

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Clause	Requirement – Test	Result - Remark	Verdict
	Labyrinth type anchorages		N
3.10 (5.2.10.2)	Cord anchorages for type Y and type Z attachments	type Z	P
3.10 (5.2.10.3)	Tests:		---
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N)	60N	P
	- torque test: torque (Nm)	0.25Nm	P
	- displacement \leq 2 mm	1.2mm	P
	- no movement of conductors		P
	- no damage of cable or cord		P
3.10 (5.2.11)	External wiring passing into luminaire		N
3.10 (5.2.12)	Looping-in terminals	No looping-in appliance	N
3.10 (5.2.13)	Wire ends not tinned		N
	Wire ends tinned: no cold flow		N
3.10 (5.2.14)	Mains plug same protection	No plug	N
	Class III luminaire plug		N
3.10 (5.2.15)	Colour code low voltage	No such leads	N
3.10 (5.2.16)	Appliance inlets (IEC 60320)	No inlet	N
	Appliance couplers of class II type		N
3.10 (5.3)	Internal wiring		---
3.10 (5.3.1)	Internal wiring of suitable size type	18AWG	P
	Through wiring		N
	-not delivered/mounting instruction		N
	-Socket outlet loaded(A).....		N
	-temperature.....		N
	Green-yellow for earth only		P
3.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		---
	cross-sectional area (mm ²)	18AWG	P
	insulation thickness	>0.6mm	P
	Extra insulation added where necessary		N
3.10 (5.3.1.2)	Internal wiring connected fixed wiring via internal current-limiting device		N
	Adequate cross-sectional area and insulation thickness		N
3.10 (5.3.1.3)	Double or reinforced insulation for class II	Class III luminaire	N
3.10 (5.3.1.4)	Conductors without insulation	Not used	N
3.10 (5.3.1.5)	SELV current-carrying parts		N

IEC 60598-2-3			
Clause	Requirement – Test	Result - Remark	Verdict
3.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N
3.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N
	Joints, raising/lowering devices		P
	Telescopic tubes etc.		N
	No twisting over 360°		P
3.10 (5.3.3)	Openings		---
	Bushings not removable		N
	Bushings in sharp openings		N
	Cables with protective sheath		N
3.10 (5.3.4)	Joints and junctions effectively insulated		---
3.10 (5.3.5)	Strain on internal wiring		P
3.10 (5.3.6)	Wire carriers		N
3.10 (5.3.7)	Wire ends not tinned	Wire ends are clamped safely	P
	Wire ends tinned: no cold flow		N
3.11 (8)	PROTECTION AGAINST ELECTRIC SHOCK		P
3.11 (8.2.1)	Live parts not accessible	Class III luminaire	P
	Protection in any position		P
	Insulation lacquer not reliable		N
	Double-ended tungsten filament lamp		N
	Double-ended high pressure discharge lamp		N
3.11 (8.2.2)	Portable luminaire adjusted in most unfavourable	Fixed luminaire	N
4.11 (8.2.3)	Class II luminaire:		---
	-basic insulated metal parts not accessible during starter or lamp replacement	Class III	N
	-basic insulation not accessible other than during starter or lamp replacement		N
	-glass protective shields not used as supplementary insulation		N
	Class I luminaire with BC lampholder		N
3.11 (8.2.4)	Portable luminaire:		---
	-protection independent of supporting surface	Fixed luminaire	N
	- terminal block completely covered		N

IEC 60598-2-3			
Clause	Requirement – Test	Result - Remark	Verdict
3.11 (8.2.6)	Covers reliably secured	No such covers	P
3.11 (8.2.7)	Discharging of capacitors $\geq 0,5 \mu\text{F}$	No such capacitors	N
	Portable plug connected luminaire with capacitor		N
	Other plug connected luminaire with capacitor		N
	Discharge device on or within capacitor		N
	Discharge device mounted separately		N
3.12 (12)	ENDURANCE TEST AND THERMAL TEST		P
3.12 (12.3)	Endurance test:		P
	- mounting-position	Fixed supporting structure	P
	- test temperature ($^{\circ}\text{C}$).....	55 $^{\circ}\text{C}$	P
	- total duration (h).....	240hrs. Totally 10 cycles, each 24h	P
	- supply voltage: Un factor; calculated voltage (V).....	1.1x18Vdc	P
	- lamp used	LED lamp	P
3.12 (12.3.2)	After endurance test:		---
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N
	- marking legible		P
	- no cracks, deformation etc.		P
3.12 (12.4)	Thermal test (normal operation)		P
3.12 (12.5)	Thermal test (abnormal operation)		N
3.12 (12.6)	Thermal test (failed lamp control gear condition):		---
3.12 (12.6.1)	- case of abnormal conditions.....		N
	- electronic lamp control gear		N
	- measured winding temperature ($^{\circ}\text{C}$): at 1,1 Un.....		N
	- measured mounting surface temperature ($^{\circ}\text{C}$): at 1,1 Un		N
	- calculated mounting surface temperature ($^{\circ}\text{C}$)		N
	- track-mounted luminaires		N
3.12 (12.6.2)	Temperature sensing control		---
	-case of abnormal conditions		N

IEC 60598-2-3			
Clause	Requirement – Test	Result - Remark	Verdict
	- thermal link		
	- manual reset cut-out		N
	- auto reset cut-out		N
	- measured mounting surface temperature (°C):		N
	- track-mounted luminaires		N
3.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		---
	- case of abnormal conditions		N
3.12 (12.7.1)	- measured winding temperature(°C) at 1,1 Un.....		N
	- measured temperature of fixing point/ exposed part (°C): at 1,1 Un		N
	- calculated temperature of fixing point/ exposed part (°C)		N
3.12 (12.7.2)	Temperature sensing control		---
	- thermal link		N
	- manual reset cut-out		N
	- auto reset cut-out		N
	- measured temperature of fixing point/ exposed part (°C):		N
3.13 (9)	RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE		P
3.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP.....	IP65	P
	- mounting position during test.....		P
	- fixing screws tightened; torque (Nm)		P
	- tests according to clauses.....		P
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		P
	b) no talcum in dust-tight luminaire		N
	c) no trace of water on current-carrying parts or where it could become a hazard		P
	d) i) For luminaires without drain holes – no water entry		P
	d) ii) For luminaires with drain holes – no hazardous water entry		N
	e) no water in watertight luminaire		N

IEC 60598-2-3			
Clause	Requirement – Test	Result - Remark	Verdict
	f) no contact with live parts (IP 2X)		N
	f) no entry into enclosure (IP 3X and IP 4X)		N
3.13 (9.3)	Humidity test 48 h	Relative humidity 93%, temperature 45°C , 120h, followed by hi-pot test	P
3.14 (10)	INSULATION RESISTANCE AND ELECTRIC STRENGTH		P
4.14 (10.2.1)	Insulation resistance test:		P
	Insulation resistance (MΩ):		P
	SELV:		---
	- between current-carrying parts of different polarity	>100 MΩ, limits: 1MΩ	P
	- between current-carrying parts and mounting surface	>100 MΩ, limits:1MΩ	P
	- between current-carrying parts and metal parts of the luminaire	>100 MΩ, limits: 1MΩ	P
	Other than SELV:		---
	- between live parts of different polarity		N
	- between live parts and mounting surface :		N
	- between live parts and metal parts		N
	- between live parts of different polarity through action of a switch		N
3.14 (10.2.2)	Electric strength test:		---
	Dummy lamp		P
	Luminaires with ignitors after 24 h test		N
	Luminaires with manual ignitors		N
	Test voltage (V):		P
	SELV:		---
	- between current carrying parts of different polarity	500Vac, 1min, no damage	P
	- between current carrying parts and mounting surface	500Vac, 1min, no damage	P
	- between current-carrying parts and metal parts of the luminaire	500Vac, 1min, no damage	P
	Other than SELV:		---
	- between live parts of different polarity		N
	- between live parts and mounting surface :		N
	- between live parts and metal parts		N

IEC 60598-2-3			
Clause	Requirement – Test	Result - Remark	Verdict
	- between live parts of different polarity through action of a switch		N
3.14 (10.3.1)	Leakage current (Ma).....		N
3.15 (13)	RESISTANCE TO HEAT, FIRE AND TRACKING		P
3.15 (13.2.1)	Ball-pressure test:		---
	- part tested; temperature (°C).....	Transparent lamp cover, 75°C, 0.8mm	P
	- part tested; temperature (°C).....		N
	- part tested; temperature (°C).....		N
3.15 (13.3.1)	Needle flame test (10 s):		---
	- part tested		N
	- part tested		N
3.15 (13.3.2)	Glow-wire test (650°C):		---
	- part tested	Transparent lamp cover, 650°C, no burning	P
	- part tested		N
	- part tested		N
3.15 (13.4.1)	Tracking test: part tested.....		N
EMF			
	The tested product also complies to the requirements of IEC 62493: 2009		--
	Limit.....0.85	Measured max.:.....0.0028	P

Tables

ANNEX 1: components						P
object/part No.	Code	manufacturer/trademark	type/model	technical data	standard	mark(s) of conformity
Internal wire	B	Shenzhen Jianhong Electronics Co.,Ltd.	Waterproof cables	2*0.75	UL-817	UL
Terminal Blocks	B	--	--	--	--	--
Plastic lens	B	Zhongshan Guzhen Fangyuan Lamshade Co.,Ltd.	--	--	--	--
Solar Panel	B	Ningbo OSda Solar Co.,LTD	Monocrystalline Solar Panel	18V100W	IEC/EN 61215:2005 ; IEC 61730-1:2004/EN61730-1:2007; IEC 61730-2:2004/EN 61730-2:2007	TUV
LifePO4 Battery	B	Mottcell	IFR26650	12.8V 57Ah	UL1642	UL MH48000
Controller	B	SRNE	SR-DH100	12V6.7A	--	CE ROHS 金太阳
FUSE	B	Shenzhen Jurui Technology Co., Ltd.	5*20	10A	GB14048.1-2001 GB14048.2-2001	CCC, CE
LED Bead	B	Shenzhen Huaxinweitian Opto-Electronics Co.,Ltd.	Bridgelux 45mil	3.1-3.3V 350MA	--	--

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

ANNEX 2: Temperature measurements, thermal tests of Section 12		P
Type reference	MP-SIL080	P
Lamp used.....	LED lamp	P
Ballast used.....	--	N
Mounting position of luminaire	Normally	P

Tables

Supply wattage (W).....	98.6W	P
Supply current (A).....		N
Calculated power factor		N
Table: measured temperatures corrected for Ta = 45°C:		P
- abnormal operating mode	--	N
- test 1: rated voltage.....		N
- test 2: 1,06 times rated voltage or 1,05 times rated wattage	18Vacx1.06	P
- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..	--	N
- test 4: 1,1 times rated voltage or 1,05 times rated wattage		N

temperature (°C) of part	clause 12.4 – normal				clause 12.5 – abnormal	
	test 1	test 2	test 3	limits	test 4	Limit
Transparent lamp cover	--	57.6	---	105	---	---
Internal wire	--	57.5	---	105	---	---
Metal enclosure	--	55.2	---	Ref.	---	---
Terminal block	---	54.1	---	85	---	---
PCB near LED	--	65.4	---	Ref.	---	---
Mounting surface	--	56.3	---	90	---	---
Surface of controller	--	50.6	---	70	---	---
Surface of LifePO4 Battery	--	53.2	---	60	---	---
Ambient	--	45.1	---	---	---	---

	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

Tables

(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

(15)	ANNEX 4: screwless terminals (part of the luminaire)	N
	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
(15.5.1)	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
(15.5.2)	Permanent connections: pull-off test (20 N)	N
(15.6)	Electrical tests	—
	Voltage drop (mV) after 1 h (4 samples)	N
	Voltage drop of two inseparable joints	N
	Number of cycles	N

Tables

	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
(15.7)	Terminals external wiring										N
	Terminal size and rating										N
(15.8.1)	Pull test spring-type terminals (4 samples); pull (N)										N
	Pull test pin or tab terminals (4 samples); pull (N)										N
(15.9)	Contact resistance test										N
	Voltage drop (mV) after 1 h										N
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Voltage drop of two inseparable joints										
	Voltage drop after 10th alt. 25th cycle										
	Max. allowed voltage drop (mV).....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Voltage drop after 50th alt. 100th cycle										
	Max. allowed voltage drop (mV).....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Continued ageing: voltage drop after 10th alt. 25th cycle										
	Max. allowed voltage drop (mV).....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Continued ageing: voltage drop after 50th alt. 100th cycle										
	Max. allowed voltage drop (mV).....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											

Attachment 1

<p>TEST REPORT</p> <p>IEC 62031</p> <p>LED MODULES FOR GENERAL LIGHTING-SAFETY SPECIFICATIONS</p>	
Report reference No.	See report IEC 60598-2-3
Tested by(name + signature)	See report IEC 60598-2-3
Approved by(name + signature) ...	See report IEC 60598-2-3
Date of issue	See report IEC 60598-2-3
Contents	See report IEC 60598-2-3
Testing laboratory	
Name	See report IEC 60598-2-3
Address	See report IEC 60598-2-3
Testing location	See report IEC 60598-2-3
Client	
Name	See report IEC 60598-2-3
Address	See report IEC 60598-2-3
Manufacturer	
Name	See report IEC 60598-2-3
Address	See report IEC 60598-2-3
Test specification	
Standard	IEC 62031: 2008+A1: 2012
Test procedure	Compliance with IEC 62031: 2008+A1: 2012
Non-standard test method	N/A
Test item Description	
Trademark	See report IEC 60598-2-3
Model and/or type reference	See report IEC 60598-2-3
Rating(s)	See report IEC 60598-2-3

IEC 62031			
Clause	Requirement - Test	Result - Remark	Verdict
4	GENERAL REQUIREMENTS		---
4.1	Modules shall be so designed and constructed that in normal use (see manufacturer's instruction) they operate without danger to the user or surroundings:		P
4.2	For LED modules, all electrical measurements, unless otherwise specified, shall be carried out at voltage limits (min/max), current limits (min/max) or power limits (min/max) and minimum frequency, in a draught-free room at the temperature limits of the allowed range specified by the manufacturer. Unless the manufacturer indicates the most critical combination, all combinations (min/max) of voltage/current/power and temperature shall be tested.		P
4.3	For self-ballasted LED modules, the electrical measurements shall be carried out at the tolerance limit values of the marked supply voltage.		N
4.4	Integral modules not having their own enclosure shall be treated as integral components of luminaires as defined in IEC 60598-1, Clause 0.5. They shall be tested assembled in the luminaire, and as far as applicable with the present standard.		P
4.5	Independent modules shall comply, in addition to this standard, with the requirements of relevant clauses of IEC 60598-1, where these requirements are not already covered in this standard.		N
4.6	If the module is a factory sealed unit, it shall not be opened for any tests. In the case of doubt based on the inspection of the module and the examination of the circuit diagram, and in agreement with the manufacturer or responsible vendor, such specially prepared modules shall be submitted for testing so that a fault condition can be simulated.		P
5	GENERAL TEST REQUIREMENTS		---
5.1	Tests according to this standard are type tests		P
5.2	Unless otherwise specified, the tests are carried out at an ambient temperature of 10°C to 30°C		P

IEC 62031			
Clause	Requirement - Test	Result - Remark	Verdict
5.3	Unless otherwise specified, the type test is carried out on one sample consisting of one or more items submitted for the purpose of the type test.		P
5.4	If the light output has detectably changed, the module shall not be used for further tests.		P
5.5	For SELV-operated LED modules, the requirements of IEC 61347-2-13, Annex I, apply additionally.		N
6	CLASSIFICATION		---
	Independent		N
	Built-in		N
	Integral		P
7	MARKING		---
7.1	Mandatory marking for built-in or independent modules		N
	a) Mark of origin (trade mark, manufacturer's name or name of the responsible vendor/supplier).		N
	b) Model number or type reference of the manufacturer.		N
	c) Either the - If the LED module requires a stable voltage(s), the rated supply voltage or voltage range, both together with the supply frequency shall be marked. Marking of the rated supply current(s) is voluntary. - If the LED module requires a stable current, the rated supply current(s) or current range, both together with the supply frequency shall be marked. Marking of the rated supply voltage(s) is voluntary.		N
	d) Nominal power.		N
	e) Indication of position and purpose of the connections where it is necessary for safety. In case of connecting wires, a clear indication shall be given in a wiring diagram.		N
	f) Value of t_c . If this relates to a certain place on the LED module, this place shall be indicated or specified in the manufacturer's literature.		N
	g) For eye protection, see requirements of IEC 62471.		N

IEC 62031			
Clause	Requirement - Test	Result - Remark	Verdict
	h) Built-in modules shall be marked in order to separate them from independent modules. The mark shall be located on the packaging or on the module itself.		N
	i) The heat transfer temperature t_d (if the LED module is provided with a cap enabling the insertion and the withdrawal without the use of tools and reliant on heat-conduction to the luminaire).		N
	k) Working voltage at which the insulation is designed.		N
7.2	Location of marking		---
	Items a), b), c) and f) of 7.1 shall be marked on the module.		N
	Items d), e), g) and h) of 7.1 shall be marked legible on the module or on the module data sheet.		N
	For integral modules, no marking is required, but the information given in 7.1 a) to g) shall be provided in the technical literature of the manufacturer.		N
7.3	Durability and legibility of marking		N
	Rubbing 15 s water, 15 s petroleum; marking legible		N
8 (14)	SCREW TERMINALS		N
	Separately approved: component list		N
	Part of the luminaire		N
8 (15)	SCREWLESS TERMINALS and electrical connections		N
	Separately approved: component list		N
	Part of the luminaire		N

IEC 62031			
Clause	Requirement - Test	Result - Remark	Verdict
9	PROVISION FOR EARTHING		N
	External metal parts connected to the earth terminal:		N
	- compliance with 7.2.1 in EN 60598-1		N
	Test with a current of 10 A between earthing terminal and each of the accessible metal parts; measured resistance (Ω): $< 0,5 \Omega$		N
	Protective earth, symbol		N
	Terminal complying with clause 8 in Part 1		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
	Conductors by tracks on printed circuit boards:		N
	- a.c. current of 25 A for 1 min between earthing terminal and accessible metal parts		N
	- compliance with clause 7.2.1 in EN 60598-1		N
10	PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS		N
10.1	Ballast protected against accidental contact with live parts		N
A1	Current measured according to EN 60990, figure 4 and clause 7.1: max. 0,7 mA (peak) or 2,0 mA d.c., for $f \geq 1000$ Hz max. 70 mA		N
A2	Voltage at 50 k Ω (V): max. 34 V (peak)		N
	Lacquer or enamel not considered to be adequate protection		N
	Adequate mechanical strength on parts providing protection		N
10.2	Capacitors $> 0,5 \mu\text{F}$: voltage after 1 min (V): < 50 V		N
11	MOISTURE RESISTANCE AND INSULATION		P

IEC 62031			
Clause	Requirement - Test	Result - Remark	Verdict
	After storage 120 h at 91-95% relative humidity and 45 °C measuring of insulation resistance with d.c. 500 V (MΩ): ≥ 2 MΩ	Refer to table 11	P
	The leakage current shall not exceed the values shown in figure 2 when measured in accordance with annex I	Refer to table 11	P
12	ELECTRIC STRENGTH		P
	Immediately after clause 11 electric strength test for 1 min	Refer to table 12	P
	Working voltage ≤ 50 V, test voltage 500 V		P
	Working voltage > 50 V, test voltage (V): 2U + 1000 V		N
	Reinforced insulation, test voltage (V):		N
	No flashover or breakdown		P
13	FAULT CONDITIONS		---
	Windings of ballasts shall have adequate thermal endurance	No such parts	N
13.1	General		P
	When operated under fault conditions the ballast: - does not emit flames or molten material	No such parts	N
	- does not produce flammable gases		N
	- protection against accidental contact not impaired		N
	Thermally protected ballasts does not exceed the marked temperature value	Not thermally protected ballasts	N
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected		N
	Short-circuit of creepage distances and clearances if less than specified in clause 18 (except between live parts and accessible metal parts)		N
	Short-circuit or interruption of semiconductor devices		N
	Short-circuit across insulation consisting of lacquer, enamel or textile		N
	Short-circuit across electrolytic capacitors		N
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite	No ignition	N
13.2	Overpower condition		P

IEC 62031			
Clause	Requirement - Test	Result - Remark	Verdict
	The test shall be started at an ambient temperature as specified in Annex A.		P
	The module shall be switched on and the power monitored (at the input side) The voltage or the current shall be increased until 150 % of the rated power is reached . The test shall be continued until the module is thermally stabilised. A stable condition is reached, if the temperature does not change by more than 5 K in 1 h. The temperature shall be measured in the tc point. The module shall withstand the overpower condition for at least 15 min, the time period of which can lie within the stabilisation period if the temperature change is ≤ 5 K.		P
	If the module contains an automatic protective device or circuit which limits the power, it is subjected to a 15 min operation at this limit. If the device or circuit effectively limits the power over this period, the module has passed the test, provided the compliance (4.1 and last paragraph of 13.2) is fulfilled.		N
	After finalising the overpower mode, the module is operated under normal conditions until thermally being stable.		P
	A module fails safe if no fire, smoke or flammable gas is produced and if the 15 min overpower condition has been withstood. To check whether molten material might present a safety hazard, a tissue paper, as specified in 4.187 of ISO 4046-4, spread below the module shall not ignite.		N
15	Construction		P
	Wood, cotton, silk, paper and similar fibrous material shall not be used as insulation.		P
16	Creepage distances and clearances		N
	Working voltage (V)	See report IEC 60598-2-3	N
	Voltage form	Sinusoidal [] Non-sinusoidal [√]	N
	PTI	< 600 [√] > 600 []	N
	Impulse withstand category (normal category II) (category III annex U)	Normal category II	N
	Rated pulse voltage (kV)		N

IEC 62031			
Clause	Requirement - Test	Result - Remark	Verdict
	(1) Current-carrying parts of different polarity: cr (mm); cl (mm)		N
	(2) Current-carrying parts and accessible parts: cr (mm); cl (mm)		N
	(3) Parts becoming live due to breakdown of basic insulation and metal parts: cr (mm); cl (mm)		N
	(4) Outer surface of cable where it is clamp and metal parts: cr (mm); cl (mm)		N
	(5) not used		N
	(6) Current-carrying parts and supporting surface: cr (mm); cl (mm)		N
17	SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS		P
17 (4.11)	Electrical connections		P
17(4.11.1)	Contact pressure	No pressure transmitted to the insulating material	P
17 (4.11.2)	Screws:		P
	- Self-tapping screws		P
	- thread-cutting screws		N
17 (4.11.3)	Screw locking:		N
	- spring washer		N
	- rivets	No rivet provided	N
17 (4.11.4)	Material of current-carrying parts	> 50% copper	P
17 (4.11.5)	No contact to wood or mounting surface	No wood	P
17 (4.11.6)	Electro-mechanical contact systems	No such construction	N
17 (4.12)	Mechanical connections and glands		P
17 (4.12.1)	Screw not made of soft metal		P
	Screws of insulating material		N
	Torque test: torque (Nm); part	See report of IEC 60598-2-3	P
	Torque test: torque (Nm); part		N
17 (4.12.2)	Screw with diameter < 3 mm screw into metal		N
17 (4.12.4)	Locked connections:		N
	- fixed arms; torque (Nm)		N
	- lampholder; torque (Nm)		N
	- push-button switches; torque (Nm)	No such switches	N
1.6 (4.12.5)	Screwed glands; force (N)		N
18	RESISTANCE TO HEAT, FIRE AND TRACKING		---
18.1	Parts of insulating material retaining live parts in position, ball-pressure test:		P
	- part; test temperature (°C)	See report of IEC 60598-2-3	P

IEC 62031			
Clause	Requirement - Test	Result - Remark	Verdict
18.2	Printed boards in accordance with IEC 60249-1, 4.3		N
18.3	External parts of insulating material preventing electric shock glow-wire test 650 °C		N
18.4	Parts of insulating material retaining live parts in position, needle-flame test 10 s:		N
	- flame extinguished within 30 s		N
	- no flaming drops igniting tissue paper		N
18.5	Tracking test	Ordinary	N
19	RESISTANCE TO CORROSION		---
	Rust protection:		N
	-10% solution of ammonium chloride in water		N
	- adequate varnish on the outer surface		N
20	Information for luminaire design		---
	Information is given in Annex D.		N
21	Heat management		---
21.1	General		N
	Clause 21 is applicable for exchangeable modules. It is not applicable for non-exchangeable modules. Exchangeability is safeguarded by means of a cap or base and a lampholder. Precondition is that a heat conducting thermal interface to the luminaire is needed for keeping the temperature below the rated maximum temperature t_c .		N
21.2	Heat-conducting foil and paste		N
	For the purpose of heat-transfer from the LED module to the luminaire, the use of a heatconducting foil can be necessary. Any heat-conducting foil shall be delivered within the LED module packaging.		N
21.3	Heat protection (under consideration)		N
	LED modules shall be equipped with a device that cuts the power off or reduces it when t_c is exceeded.		N
21.4	Construction		N

IEC 62031			
Clause	Requirement - Test	Result - Remark	Verdict
	The heat-conduction from the LED module to the luminaire, the electrical connection and the mechanical holding in the cap/holder system should be separate unless the contrary is proven safe (under consideration).		N
Annex D	Information for luminaire design		--
D.1	General		N
	For safe operation of these LED modules, it is essential to observe the recommendations of this annex.		N
D.2	Design freedom		N
	A diagrammatic cross section of an LED module fixed by means of a lampholder to a luminaire with the locations for temperature measurements (t_a , t_c , t_d , t_j and t_l) and thermal resistances (R_{th} , module, R_{th} , luminaire and R_{th} , ambient) is given with Figure D.1.		N
D.3	Testing in the luminaire		N
	The knowledge of t_d and P_d as provided by the LED module manufacturer, of the geometry and the surface properties of the cap and of the t_a of the luminaire to be designed, will allow for designing a luminaire that will most probably keep the t_c of the LED module. However, testing in the luminaire if the luminaires does so will still be necessary.		N

Tables

Table 11(a)		Humidity test			N
Test condition:	Temperature	Relative Humidity	Duration	Breakdown (Y/N)	
	45°C	93%	120 hours	N	
Test points		Measured insulation		Limited insulation	
Between	To				
+ & -	Enclosure	>100MΩ		1MΩ	

Table 11(b)		Touch current measurement (mA)			N
Condition	Normal		Reverse		
Model No.	ON	OFF	ON	OFF	
--	--	--	--	--	

Table 12		Electric strength		P
Test points		Test voltage		Results
Between	To			
+ & -	Enclosure	500Vac		No breakdown

13		TABLE: tests of fault conditions		N
Part	Simulated fault	Test result		Hazard

16		TABLE: creepage distances and clearances					N
		Minimum distances for a.c. (50/60 Hz) sinusoidal voltages					N
RMS working voltage (V) not exceeding		50	150	250	500	750	1000
1 minimum distances between live parts of different polarity. Specify the value measured.							
2 minimum distances between live parts and accessible parts which are permanently fixed to the ballast, including screws or devices for fixing covers or fixing the ballast to its support. Specify the value measured.							
- required creepage distances (mm), insulation PTI ≥ 600		0,6	1,4	1,7	3	4	5,5
- required creepage distances (mm), insulation PTI < 600		1,2	1,6	2,5	5	8	10
- required clearances (mm)		0,2	1,4	1,7	3	4	5,5
3 minimum distances between live parts and a flat supporting surface or a loose metal cover, if any, if the construction does not ensure that the values under 2 above are maintained under the most unfavourable circumstances							
- required clearances (mm)		2	3,2	3,6	4,8	6	8
		Minimum distances for non-sinusoidal pulse voltages					N

Tables

rated pulse voltage (peak kV)	2,0	2,5	3,0	4,0	5,0	6,0	8,0
required minimum distances, clearances (mm)	1,0	1,5	2	3	4	5,5	8
Specify the value measured							
rated pulse voltage (peak kV)	10	12	15	20	25	30	40
required minimum distances, clearances (mm)	11	14	18	25	33	40	60
Specify the value measured							
rated pulse voltage (peak kV)	50	60	80	100	-	-	-
required minimum distances, clearances (mm)	75	90	130	170	-	-	-
Specify the value measured							

ATTACHMENT 2 Photo Documentation

View:
Model:
MP-SIL080

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB

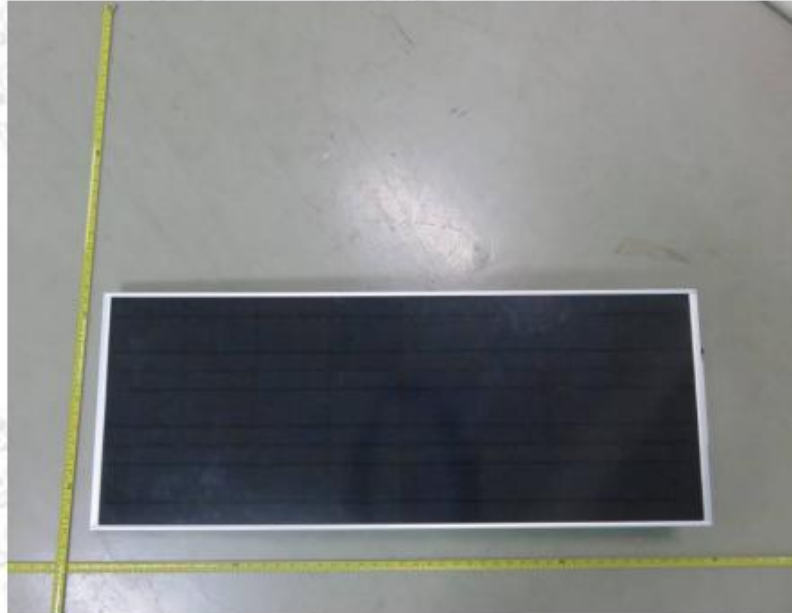


Figure 1

View:

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB



Figure 2

ATTACHMENT 2 Photo Documentation

View:

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB



Figure 3

View:

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB

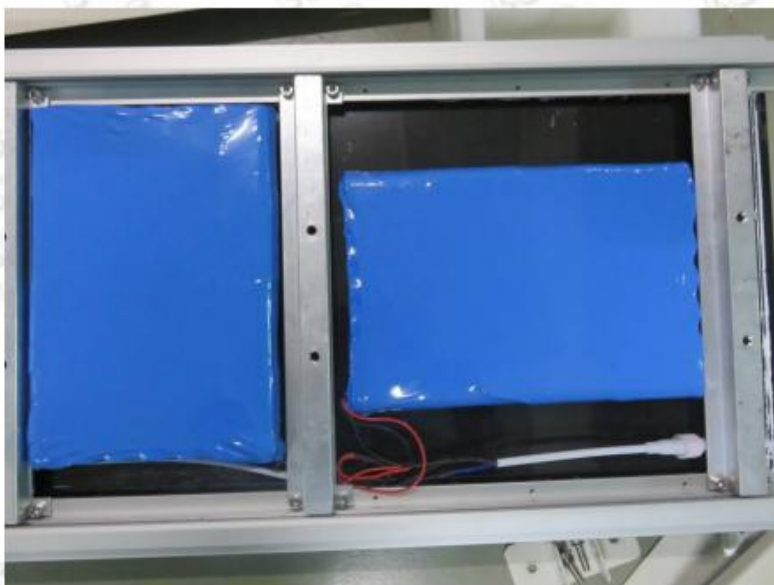


Figure 4

ATTACHMENT 2 Photo Documentation

View:

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB



Figure 5

View:

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB



Figure 6

ATTACHMENT 2 Photo Documentation

View:
Model:
MP-SIL008
MP-SIL012

General
Front
Rear
Internal
Top
Bottom
PWB




Figure 9

View:
Model:
MP-SIL015

General
Front
Rear
Internal
Top
Bottom
PWB



Figure 10

ATTACHMENT 2 Photo Documentation

View:
Model:
MP-SIL020

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB



Figure 11

View:
Model:
MP-SIL025

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB



Figure 12

ATTACHMENT 2 Photo Documentation

View:
Model:
MP-SIL030
MP-SIL040

General
Front
Rear
Internal
Top
Bottom
PWB



Figure 13

View:
Model:
MP-SIL050
MP-SIL060
MP-SIL070

General
Front
Rear
Internal
Top
Bottom
PWB



Figure 14