Verification of Conformity

Certificate No.: 19ZCTE0522002EC

Applicant	:	**DANYANG BRIGHT-MOON LIGHTING CO.,LTD**
Address	:	South of Huguo Road, Erling Town, Danyang City, Jiangsu
Manufacturer	:	**DANYANG BRIGHT-MOON LIGHTING CO.,LTD**
Address	:	South of Huguo Road, Erling Town, Danyang City, Jiangsu
Product		**LED STREET LIGHTING**
Brand Name	:	**BM LIGHTING**
Model No.	:	**BML-2018A BML-2018B, BML-2018C, BMSL-009, BMSL-010, BMSL-018, BMSL-019, BMSL-001, BMSL-002, BMSL-004, BML-2019A/B/C, BML-158, BML-98, BML-95A/B/C, BML-127, BML-13B, BML-06, BML-130, BML-77, BML-110, BML-101, BML-88, BML-80, BML-69, BML-68, BML-80, BML-29, BML-619A/B, BMLF-018, BMLF-004, BMLF-010, BMLG-1018, BMLG-1001, BMLG-1004, BMLG-1007, BMLG-1008, BMLG-1009, BMLG-1010, BMLH-201, BMLH-202, BMLH-209, BMLH-698, BMS-98, BMS-168A/B, BMS-26E, BMS-199A/B, BMS-61, BMS-58, BMS-01, BMS-02B, BMS-03A/B, BMS-100, BMS-141, BMS-150, BMS-79, BMS-110, BMS-63, BMG-152, BMG-102, BMF-210, BMF-202, BMF-402, MOON-STAR-A, MOON-STAR-B, MOON-STAR-C, MOON-STAR-D, MOON-STAR-E, SELENE, LUNA, BML-2020A, BML-2020B, BML-2020C**

Requirement	Applied Standards	Document Evidence	Result
EMC Directive	2014/30/EU Electromagnetic Compatibility	Test Report: 19ZCTE0522002ER	Conform
EMC Standards	EN 55015:2013/A1:2015 EN 61547:2009 EN 61000-3-2:2014 EN 61000-3-3:2013		

CE

Digitally signed by Scai Ion
Date: 2024.03.12 19:14:50 EET
Reason: MoldSign Signature
Location: Moldova

Tomy Wu

May. 28, 2019

Remark: This Certification of Conformity has been issued on a voluntary basis. ZCT confirms that a Technical Construction File (TCF) is existent for the above listed product(s). The TCF satisfactorily covers the essential requirements of the above listed Directive(s).
Other relevant Directives have to be observed in case they are applicable.
This Document is only valid for the equipment and configuration described and in conjunction with the TCF detailed above. Whereas the Manufacturer is responsible of the certification of the product(s) and not exempted to perform all the necessary activities before placing the product(s) on the market.
The Manufacturer is also responsible of the internal production control to ensure the product(s) compliance with the essential requirements of the above mentioned Directive(s).
It is recommended that the product bear the CE mark, the notified body number(s) as depicted on the right,only when all the essential requirements have been met, and has been filed with the Commission. This certificate can be checked for validity at **www.renzhengjiance.com**

Shenzhen ZCT Technology Co., Ltd.
3/F.,Building 5, Hongsheng Industrial Zone, Bao'an Road, Xixiang Street,Bao'an District, Shenzhen, Guangdong, China.
✆ : 400-669-6965 ✆ : 86-755-23702323, ✉ : admin@renzhengjiance.com, e : http://www.renzhengjiance.com.

Verification of Conformity

Certificate No.: 19ZCTS0522003LC

Applicant	:	**DANYANG BRIGHT-MOON LIGHTING CO.,LTD**
Address	:	South of Huguo Road, Erling Town, Danyang City, Jiangsu
Manufacturer	:	**DANYANG BRIGHT-MOON LIGHTING CO.,LTD**
Address	:	South of Huguo Road, Erling Town, Danyang City, Jiangsu
Product	:	**LED STREET LIGHTING**
Brand Name	:	**BM LIGHTING**
Model No.	:	**BML-2018A** **BML-2018B, BML-2018C, BMSL-009, BMSL-010, BMSL-018, BMSL-019, BMSL-001, BMSL-002, BMSL-004, BML-2019A/B/C, BML-158, BML-98, BML-95A/B/C, BML-127, BML-13B, BML-06, BML-130,BML-77, BML-110, BML-101, BML-88, BML-80, BML-69, BML-68, BML-80, BML-29, BML-619A/B, BMLF-018, BMLF-004, BMLF-010,BMLG-1018, BMLG-1001, BMLG-1004, BMLG-1007,BMLG-1008, BMLG-1009, BMLG-1010, BMLH-201, BMLH-202, BMLH-209, BMLH-698, BMS-98, BMS-168A/B, BMS-26E, BMS-199A/B, BMS-61, BMS-58, BMS-01, BMS-02B, BMS-03A/B, BMS-100, BMS-141, BMS-150, BMS-79, BMS-110, BMS-63, BMG-152, BMG-102, BMF-210, BMF-202, BMF-402,MOON-STAR-A ,MOON-STAR-B ,MOON-STAR-C,MOON-STAR-D MOON-STAR-E,SELENE,LUNA,BML-2020A,BML-2020B,BML-2020C**

Requirement	Applied Standards	Document Evidence	Result
LVD Directive	2014/35/EU Low Voltage	Test Report: 19ZCTS0522003LR	Conform
LVD Standards	EN 60598-2-3:2003+A1:2011 EN 60598-1:2015+AC:2017		

CE

Tomy Wu

Tomy Wu

May 24, 2019

Remark: This Certification of Conformity has been issued on a voluntary basis. ZCT confirms that a Technical Construction File (TCF) is existent for the above listed product(s). The TCF satisfactorily covers the essential requirements of the above listed Directive(s).

Other relevant Directives have to be observed in case they are applicable.

This Document is only valid for the equipment and configuration described and in conjunction with the TCF detailed above. Whereas the Manufacturer is responsible of the certification of the product(s) and not exempted to perform all the necessary activities before placing the product(s) on the market.

The Manufacturer is also responsible of the internal production control to ensure the product(s) keep(s) compliance with the essential requirements of the above mentioned Directive(s).

It is recommended that the product bear the CE mark, the notified body number(s) as depicted to the right, only when all the essential requirements have been met, and has been filed with the [illegible]

Shenzhen ZCT Technology Co., Ltd.

3/F., Building 5, Hongsheng Industrial Zone, Bao'an Road, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China.

✆ : 400-669-6965 ✆ : 86-755-23702323, ✉ : admin@renzhengjiance.com, e : http://www.renzhengjiance.com.

Verification of Conformity

Certificate No.: 19ZCTE0522002EC

Applicant	:	**DANYANG BRIGHT-MOON LIGHTING CO.,LTD**
Address	:	South of Huguo Road, Erling Town, Danyang City, Jiangsu
Manufacturer	:	**DANYANG BRIGHT-MOON LIGHTING CO.,LTD**
Address	:	South of Huguo Road, Erling Town, Danyang City, Jiangsu
Product		**LED STREET LIGHTING**
Brand Name	:	**BM LIGHTING**
Model No.	:	**BML-2018A BML-2018B, BML-2018C, BMSL-009, BMSL-010, BMSL-018, BMSL-019, BMSL-001, BMSL-002, BMSL-004, BML-2019A/B/C, BML-158, BML-98, BML-95A/B/C, BML-127, BML-13B, BML-06, BML-130, BML-77, BML-110, BML-101, BML-88, BML-80, BML-69, BML-68, BML-80, BML-29, BML-619A/B, BMLF-018, BMLF-004, BMLF-010, BMLG-1018, BMLG-1001, BMLG-1004, BMLG-1007, BMLG-1008, BMLG-1009, BMLG-1010, BMLH-201, BMLH-202, BMLH-209, BMLH-698, BMS-98, BMS-168A/B, BMS-26E, BMS-199A/B, BMS-61, BMS-58, BMS-01, BMS-02B, BMS-03A/B, BMS-100, BMS-141, BMS-150, BMS-79, BMS-110, BMS-63, BMG-152, BMG-102, BMF-210, BMF-202, BMF-402, MOON-STAR-A, MOON-STAR-B, MOON-STAR-C, MOON-STAR-D, MOON-STAR-E, SELENE, LUNA, BML-2020A, BML-2020B, BML-2020C**

Requirement	Applied Standards	Document Evidence	Result
EMC Directive	2014/30/EU Electromagnetic Compatibility	Test Report: 19ZCTE0522002ER	Conform
EMC Standards	EN 55015:2013/A1:2015 EN 61547:2009 EN 61000-3-2:2014 EN 61000-3-3:2013		

CE

Tomy Wu

May. 28, 2019

Remark: This Certification of Conformity has been issued on a voluntary basis. ZCT confirms that a Technical Construction File (TCF) is existent for the above listed product(s). The TCF satisfactorily covers the essential requirements of the above listed Directive(s).
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The Manufacturer is also responsible of the internal production control to ensure the product(s) compliance with the essential requirements of the above mentioned Directive(s).
It is recommended that the product bear the CE mark, the notified body number(s) as depicted on the right,only when all the essential requirements have been met, and has been filed with the Commission. This certificate can be checked for validity at **www.renzhengjiance.com**

Shenzhen ZCT Technology Co., Ltd.
3/F.,Building 5, Hongsheng Industrial Zone, Bao'an Road, Xixiang Street,Bao'an District, Shenzhen, Guangdong, China.
✆ : 400-669-6965 ✆ : 86-755-23702323, ✉ : admin@renzhengjiance.com, e : http://www.renzhengjiance.com.

LED STREET LIGHTING

IK08 TEST REPORT

Report No.:	19ZCTS0527001TR
Trade Name:	BM LIGHTING
Model Number:	BML-2018A BML-2018B,BML-2018C
Prepared for:	DANYANG BRIGHT-MOON LIGHTING CO.,LTD
Address:	South of Huguo Road, Erling Town, Danyang City, Jiangsu

Test Date: 2019-05-13 to 2019-05-28

Date of Report : 2019-05-28

This test report consists of **5** pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by ZCT. The test results in the report only apply to the tested sample. The test report shall be invalid without all the signatures of testing engineers, reviewer and approver. Any objections must be raised to ZCT within 15 days since the date when the report is received. It will not be taken into consideration beyond this limit.

Prepared by: Sandy Chen **Reviewed by:** Jing Guo **Approved by:** Tony Wu

IP66 TEST REPORT

Applicant	:	**DANYANG BRIGHT-MOON LIGHTING CO.,LTD**
Address	:	South of Huguo Road, Erling Town, Danyang City, Jiangsu
Manufacturer	:	**DANYANG BRIGHT-MOON LIGHTING CO.,LTD**
Address	:	South of Huguo Road, Erling Town, Danyang City, Jiangsu
Product Name	:	**LED STREET LIGHTING**
Trade Mark	:	BM LIGHTING
Model No.	:	**BML-2018A** BML-2018B,BML-2018C
Ratings	:	Input:100-240VAC 50/60Hz 300W
Standard	:	Degrees Of Protection Provided By Enclosures IEC 60529 : 1989 + A1 : 1999 + A2 : 2013
Date of Receiver	:	May 13, 2019
Date of Test	:	May 13, 2019. to May 28,2019
Date of Issue	:	May 28,2019
Test Report Form No	:	19ZCTS0527005LR
Test Result	:	Pass *

This Test Report is Issued Under the Authority of :

Compiled by.....:Sandy Chen

Reviewer by.....:King Guo

Approved by.....:Tomy Wu

*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 Shenzhen ZCT Technology Co.,Ltd. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Verification of Conformity

Certificate No.: 19ZCTC0522004RC

Applicant	:	**DANYANG BRIGHT-MOON LIGHTING CO.,LTD**
Address	:	South of Huguo Road, Erling Town, Danyang City, Jiangsu
Manufacturer	:	**DANYANG BRIGHT-MOON LIGHTING CO.,LTD**
Address	:	South of Huguo Road, Erling Town, Danyang City, Jiangsu
Product	:	**LED STREET LIGHTING**
Brand Name	:	**BM LIGHTING**
Model No.	:	**BML-2018A BML-2018B, BML-2018C, BMSL-009, BMSL-010, BMSL-018, BMSL-019, BMSL-001, BMSL-002, BMSL-004, BML-2019A/B/C, BML-158, BML-98, BML-95A/B/C, BML-127, BML-13B, BML-06, BML-130, BML-77, BML-110, BML-101, BML-88, BML-80, BML-69, BML-68, BML-80, BML-29, BML-619A/B, BMLF-018, BMLF-004, BMLF-010, BMLG-1018, BMLG-1001, BMLG-1004, BMLG-1007, BMLG-1008, BMLG-1009, BMLG-1010, BMLH-201, BMLH-202, BMLH-209, BMLH-698, BMS-98, BMS-168A/B, BMS-26E, BMS-199A/B, BMS-61, BMS-58, BMS-01, BMS-02B, BMS-03A/B, BMS-100, BMS-141, BMS-150, BMS-79, BMS-110, BMS-63, BMG-152, BMG-102, BMF-210, BMF-202, BMF-402, MOON-STAR-A, MOON-STAR-B, MOON-STAR-C, MOON-STAR-D, MOON-STAR-E, SELENE, LUNA, BML-2020A, BML-2020B, BML-2020C**

Requirement	Applied Standards	Document Evidence	Result
RoHS Directive	2011/65/EU 2015/863	Test Report: 19ZCTC0522004RR	Conform
RoHS Standards	IEC 62321:2013		

RoHS

Jack Yang

Jack Yang
May. 28, 2019

Remark: The Certificate of compliance is based on a test procedure or an evaluation of the above-mentioned product.This is to certify that the above-mentioned product is in compliance with the RoHS Directive (2011/65/EU) and its subsequent amendments EU No. (2015/863) of the European parliament on the Restriction of the use of certain Hazardous Substances [Lead (Pb); Mercury (Hg); cadmium (Cd); Hexavalent chromium (Cr); polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs); Hexabromocyclododecane (HBCDD); Bis-(2-ethylhecyl) Phthalate (DEHP); Benzylbutyl Phthalate (BBP); Dibutyl Phthalate (DBP)] in Electrical and Electronic equipm
certificate can be checked for validity at **www.renzhengjiance.com**

Shenzhen ZCT Technology Co., Ltd.
3/F.,Building 5, Hongsheng Industrial Zone, Bao'an Road, Xixiang Street,Bao'an District, Shenzhen, Guangdong, China.
✆ : 400-669-6965 ✆ : 86-755-23702323, ✉ : admin@renzhengjiance.com, 🌐 : http://www.renzhengjiance.com.

Test Report issued under the responsibility of:

NCB TÜV SÜD PSB Pte Ltd.
1 Science Park Drive, 118221 Singapore
Singapore

TEST REPORT
IEC 60598-2-3
Luminaires
Part 2: Particular requirements
Section 3: Luminaires for road and street lighting

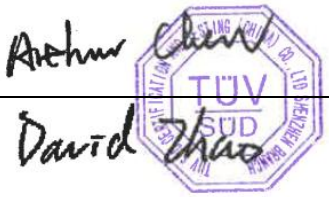
Report Number.....:	211-14190260-000
Date of issue .....:	2019-09-06
Total number of pages.....:	47 (not including attachments)
Name of Testing Laboratory preparing the Report.....:	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Applicant's name .....:	DANYANG BRIGHT-MOON LIGHTING CO., LTD.
Address .....:	South Of Huguo Road, Erling Town, 212300 Danyang City, Jiangsu Province, PEOPLE'S REPUBLIC OF CHINA
Test specification:	
Standard.....:	IEC 60598-2-3:2002, AMD1:2011 used in conjunction with IEC 60598-1:2014, AMD1:2017
Test procedure.....:	CB scheme + CE-LVD
Non-standard test method.....:	N/A
Test Report Form No. .....:	IEC60598_2_3L
Test Report Form(s) Originator....:	Intertek Semko AB
Master TRF .....:	Dated 2018-03-09

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

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description..... :	LED STREET LIGHT
Trade Mark..... :	--
Manufacturer..... :	Same as applicant
Model/Type reference..... :	BML-2018A 300W; BML-2018A 240W; BML-2018A 200W; BML-2018B 150W; BML-2018B 120W; BML-2018B 100W; BML-2018B 80W; BML-2018C 60W; BML-2018C 50W; BML-2018C 40W; BML-2018C 30W
Ratings..... :	120-240VAC, 50/60Hz; 300W [BML-2018A 300W]; 240W [BML-2018A 240W]; 200W [BML-2018A 200W]; 150W [BML-2018B 150W]; 120W [BML-2018B 120W]; 100W [BML-2018B 100W]; 80W [BML-2018B 80W]; 60W [BML-2018C 60W]; 50W [BML-2018C 50W]; 40W [BML-2018C 40W]; 30W [BML-2018C 30W]

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☒	**CB Testing Laboratory:**	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch	
Testing location/ address.....:		Building 12&13, Zhiheng Wisdomland Business Park Nantou Checkpoint Road 2, Nanshan District 518052 Shenzhen CHINA	
Tested by (name, function, signature).....:		Arthur Chen Project Handler	
Approved by (name, function, signature)...:		David Zhao Designated Reviewer	
☐	**Testing procedure: CTF Stage 1:**		
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 2:**		
Testing location/ address.....:			
Tested by (name + signature) .....:			
Witnessed by (name, function, signature)..:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 3:**		
☐	**Testing procedure: CTF Stage 4:**		
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Witnessed by (name, function, signature)..:			
Approved by (name, function, signature)...:			
Supervised by (name, function, signature) :			

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

Attachment No. 1:

- 2 pages of test report for European group differences and national differences for EN 60598-2-3:2003+A1:2011 and EN 60598-1:2015+A1:2018;

Attachment No. 2:

- 8 pages of test report for IEC 62031:2008; IEC 62031:2008/AMD1:2012; IEC 62031:2008/AMD2:2014;
- 1 page of test report for European group differences and national differences for EN 62031:2008+A1:2013+A2:2015 (for LED module);

Attachment No. 3:

- 2 pages of test report for IEC TR 62778:2014;

Attachment No. 4:

- 15 pages of photo documentation.

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
- IEC 60598-1:2014 - IEC 60598-1:2014/AMD:2017 - IEC 60598-2-3:2002 - IEC 60598-2-3:2002/AMD1:2011 - EN 60598-2-3:2003+A1:2011 - EN 60598-1:2015+A1:2018 - EN 62493:2015 The LED modules in products were found to comply with the requirements of - IEC 62031:2008 - IEC 62031:2008/AMD1:2012 - IEC 62031:2008/AMD2:2014 - EN 62031:2008+A1:2013+A2:2015 The submitted samples were LED-light-source technology, they were found to comply with the requirement of IEC 62493:2015 and EN 62493:2015 without test. The submitted samples were classified as RG1 according to IEC TR 62778:2014. The submitted samples were found to comply with above test specification.	Building 12&13, Zhiheng Wisdomland Business Park Nantou Checkpoint Road 2, Nanshan District 518052 Shenzhen CHINA

Summary of compliance with National Differences:

European group differences and national differences

- EN 60598-2-3:2003+A1:2011
- EN 60598-1:2015+A1:2018
- EN 62493:2015

Copy of marking plate:

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

According to the EU directives which have been aligned with EU NLF (new legislative framework), both of manufacturer and importer's name and address shall be affixed on the product or, where that is not possible, on its packaging or in a document accompanying the product before the product is placed on the EU market.

The labels of other models are the same as following rating label, except that the model no., CCT, rated current and rated power are different.

Location: sticking on metal enclosure (back).

Location: (height of WEEE mark at least 7mm, height of other marks at least 5mm, height of letters and numerals at least 2mm.)

Test item particulars:

Classification of installation and use.....:	Fixed
Supply connection.....:	Supply cord without plug
Protection class .....:	I
Degree of protection .....:	IP66
ta.....:	40°C

Possible test case verdicts:

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

Testing:

Date of receipt of test item.....:	2019-05-14
Date (s) of performance of tests .....:	2019-05-14 to 2019-09-06

General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. **Throughout this report a ☒ comma / ☐ point is used as the decimal separator.** **Clause numbers between brackets refer to clauses in IEC 60598-1** The manufacturer/ Importer has to ensure the appliance placing on the EU market conforms to the applicable EU directives which provide the affixing of the CE marking, such as LVD, EMC, RoHS, ErP, and so on. The relevant CE-LVD test report No. is 68.140.19.0260.01.	
Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided..... :	☐ **Yes** ☒ **Not applicable**
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies)..... : Same as applicant	

General product information:

LED street light for indoor and outdoor use.

Details information are listed as follows:

Model	Rated power (W)	Mounting height (m)	LED driver	LED quantity (pcs)	Weight (kg) max.	Size (L x W x H) (mm)
BML-2018A 300W	300	10-13	EUK-320S460DV	360	12,0	847*400*150
BML-2018A 240W	240	10-13		240	12,0	
BML-2018A 200W	200	10-13		240	12,0	
BML-2018B 150W	150	8-10	EUK-150S350DV	192	9,5	740*344*145
BML-2018B 120W	120	8-10		144	9,5	
BML-2018B 100W	100	8-10		144	9,5	
BML-2018B 80W	80	6-8	EUK-096S210DV	144	9,5	
BML-2018C 60W	60	5-6	EUC-060S180SVM	72	5,0	580*240*140
BML-2018C 50W	50	5-6		72	5,0	
BML-2018C 40W	40	4-5	EUC-035S070SVM	72	5,0	
BML-2018C 30W	30	4-5		72	5,0	

Unless otherwise specified, the model BML-2018A 300W was chosen as representative model to perform all tests.

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.2 (0)	**GENERAL TEST REQUIREMENTS**		¾
3.2 (0.3)	More sections applicable .....:	Yes ☐ No ☒	¾
3.2 (0.5)	Components	(see Annex 1)	¾
3.2 (0.7)	**Information for luminaire design in light sources standards**		¾
3.2 (0.7.2)	Light source safety standard .....:	IEC/EN 62031	¾
	Luminaire design in the light source safety standard		P
3.4 (2)	**CLASSIFICATION OF LUMINAIRES**		¾
3.4 (2.2)	Type of protection .....:	Class I	¾
3.4 (2.3)	Degree of protection.....:	IP66	¾
3.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces .....:	Yes ☐ No ☒	¾
3.4 (2.5)	Luminaire for normal use .....:	Yes ☒ No ☐	¾
	Luminaire for rough service .....:	Yes ☐ No ☒	¾
3.4 (-)	Modes of installation of road or street lighting		¾
	a) on a pipe	Yes ☐ No ☒	¾
	b) on a mast arm	Yes ☒ No ☐	¾
	c) on a post top	Yes ☐ No ☒	¾
	d) on span or suspension wires	Yes ☐ No ☒	¾
	e) on a wall	Yes ☐ No ☒	¾
3.5 (3)	**MARKING**		¾
3.5 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
3.5 (3.3)	Additional information		P
	Language of instructions	English	P
3.5 (3.3.1)	Combination luminaires		N/A
3.5 (3.3.2)	Nominal frequency in Hz	50/60Hz	P
3.5 (3.3.3)	Operating temperature		N/A
3.5 (3.3.5)	Wiring diagram		N/A
3.5 (3.3.6)	Special conditions		N/A
3.5 (3.3.7)	Metal halide lamp luminaire – warning		N/A
3.5 (3.3.8)	Limitation for semi-luminaires		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.5 (3.3.9)	Power factor and supply current		N/A
3.5 (3.3.10)	Suitability for use indoors		P
3.5 (3.3.11)	Luminaires with remote control		N/A
3.5 (3.3.12)	Clip-mounted luminaire – warning		N/A
3.5 (3.3.13)	Specifications of protective shields		N/A
3.5 (3.3.14)	Symbol for nature of supply		P
3.5 (3.3.15)	Rated current of socket outlet		N/A
3.5 (3.3.16)	Rough service luminaire		N/A
3.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments	Type Y	P
3.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A
3.5 (3.3.19)	Protective conductor current in instruction if applicable		N/A
3.5 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
3.5 (3.3.21)	Non-replaceable and non-user replaceable light sources information provided	Non-user replaceable light sources	P
3.5 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
3.5 (3.3.23)	Luminaire without controlgear provided with necessary information for selection of appropriate component		N/A
3.5 (3.3.24)	If not supplied with terminal block, information on the packaging		P
3.5 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P
3.5 (-)	Additional information in instruction leaflet		P
	a) Design attitude		P
	b) Weight		P
	c) Overall dimensions		P
	d) Maximum projected area if applicable		P
	e) Cross-sectional area of wires if applicable		N/A
	f) Suitability for indoors use		P
	g) Dimensions of the compartment		N/A
	h) Torque setting to be applied to bolts or screws		P

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Clause	Requirement + Test	Result - Remark	Verdict
	i) Maximum mounting height		P
3.6 (4)	**CONSTRUCTION**		—
3.6 (4.2)	Components replaceable without difficulty		P
3.6 (4.3)	Wireways smooth and free from sharp edges		P
3.6 (4.4)	**Lampholders**		N/A
3.6 (4.4.1)	Integral lampholder		N/A
3.6 (4.4.2)	Wiring connection		N/A
3.6 (4.4.3)	Lampholder for end-to-end mounting		N/A
3.6 (4.4.4)	Positioning		N/A
	- pressure test (N) .....:		—
	After test the lampholder comply with relevant standard sheets and show no damage		N/A
	After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation		N/A
	- bending test (N) .....:		—
	After test the lampholder have not moved from its position and show no permanent deformation		N/A
3.6 (4.4.5)	Peak pulse voltage		N/A
3.6 (4.4.6)	Centre contact		N/A
3.6 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A
3.6 (4.4.8)	Lamp connectors		N/A
3.6 (4.4.9)	Caps and bases correctly used		N/A
3.6 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N/A
3.6 (4.5)	**Starter holders**		N/A
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
3.6 (4.6)	**Terminal blocks**		N/A
	Tails		N/A
	Unsecured blocks		N/A
3.6 (4.7)	**Terminals and supply connections**		**P**
3.6 (4.7.1)	Contact to metal parts		N/A
3.6 (4.7.2)	Test 8 mm live conductor		P
	Test 8 mm earth conductor		P

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Clause	Requirement + Test	Result - Remark	Verdict
3.6 (4.7.3)	Terminals for supply conductors		P
3.6 (4.7.3.1)	Welded method and material		N/A
	- stranded or solid conductor		N/A
	- spot welding		N/A
	- welding between wires		N/A
	- Type Z attachment		N/A
	- mechanical test according to 15.6.2		N/A
	- electrical test according to 15.6.3		N/A
	- heat test according to 15.6.3.2.3 and 15.6.3.2.4		N/A
3.6 (4.7.4)	Terminals other than supply connection		P
3.6 (4.7.5)	Heat-resistant wiring/sleeves		N/A
3.6 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A
3.6 (4.8)	**Switches**		N/A
	- adequate rating		N/A
	- adequate fixing		N/A
	- polarized supply		N/A
	- compliance with IEC 61058-1 for electronic switches		N/A
3.6 (4.9)	**Insulating lining and sleeves**		N/A
3.6 (4.9.1)	Retainment		N/A
	Method of fixing .....:		N/A
3.6 (4.9.2)	Insulated linings and sleeves:		N/A
	Resistant to a temperature > 20 °C to the wire temperature or		N/A
	a) & c) Insulation resistance and electric strength		N/A
	b) Ageing test. Temperature (°C) .....:		N/A
3.6 (4.10)	**Double or reinforced insulation**		N/A
3.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		N/A
	Safe installation fixed luminaires		N/A
	Capacitors and switches		N/A
	Interference suppression capacitors according to IEC 60384-14		N/A
3.6 (4.10.2)	Assembly gaps:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- not coincidental		N/A
	- no straight access with test probe		N/A
3.6 (4.10.3)	Retainment of insulation:		N/A
	- fixed		N/A
	- unable to be replaced; luminaire inoperative		N/A
	- sleeves retained in position		N/A
	- lining in lampholder		N/A
3.6 (4.10.4)	Protective impedance device		N/A
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor		N/A
	Y1 or Y2 capacitors comply with IEC 60384-14		N/A
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A
3.6 (4.11)	**Electrical connections and current-carrying parts**		**P**
3.6 (4.11.1)	Contact pressure		P
3.6 (4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
3.6 (4.11.3)	Screw locking:		P
	- spring washer		P
	- rivets		N/A
3.6 (4.11.4)	Material of current-carrying parts		P
3.6 (4.11.5)	No contact to wood or mounting surface		P
3.6 (4.11.6)	Electro-mechanical contact systems		P
3.6 (4.12)	**Screws and connections (mechanical) and glands**		**P**
3.6 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N/A
	Torque test: torque (Nm); part.....:	Screw for fixing mounting bracket; 17,0Nm	P
	Torque test: torque (Nm); part.....:	Screw for fixing earthing terminal: 1,2Nm	P
	Torque test: torque (Nm); part.....:	Screw for fixing lamp cover: 2,0Nm	P
3.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
3.6 (4.12.4)	Locked connections:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- fixed arms; torque (Nm).....:		N/A
	- lampholder; torque (Nm).....:		N/A
	- push-button switches; torque 0,8 Nm.....:		N/A
3.6 (4.12.5)	Screwed glands; force (Nm).....:	3,25	P
3.6 (4.13)	**Mechanical strength**		**P**
3.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm).....:	Lamp cover; 0,5Nm	P
	- other parts; energy (Nm).....:	Metal enclosure; 0,7Nm	P
	1) live parts		P
	2) linings		N/A
	3) protection		P
	4) covers		P
3.6 (4.13.2)	Metal parts have adequate mechanical strength		P
3.6 (4.13.3)	Straight test finger		P
3.6 (4.13.4)	Rough service luminaires		N/A
	- IP54 or higher		N/A
	a) fixed		N/A
	b) hand-held		N/A
	c) delivered with a stand		N/A
	d) for temporary installations and suitable for mounting on a stand		N/A
3.6 (4.13.6)	Tumbling barrel		N/A
3.6 (4.14)	**Suspensions, fixings and means of adjusting**		**P**
3.6 (4.14.1)	Mechanical load:		P
	A) four times the weight		P
	B) torque 2,5 Nm		P
	C) bracket arm; bending moment (Nm).....:		N/A
	D) load track-mounted luminaires		N/A
	E) clip-mounted luminaires, glass-shelve. Thickness (mm) .....:		N/A
	Metal rod. diameter (mm).....:		N/A
	Fixed luminaire or independent control gear without fixing devices		N/A
3.6 (4.14.2)	Load to flexible cables		N/A
	Mass (kg) .....:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Stress in conductors (N/mm²) .....:		N/A
	Mass (kg) of semi-luminaire .....:		N/A
	Bending moment (Nm) of semi-luminaire .....:		N/A
3.6 (4.14.3)	Adjusting devices:		P
	- flexing test; number of cycles.....:	45 cycles	P
	- strands broken .....:	0	P
	- electric strength test afterwards		P
3.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
3.6 (4.14.5)	Guide pulleys		N/A
3.6 (4.14.6)	Strain on socket-outlets		N/A
3.6 (4.15)	**Flammable materials**		P
	- glow-wire test 650°C.....:	See Test Table 3.15 (13.3.2)	P
	- spacing ³ 30 mm		N/A
	- screen withstanding test of 13.3.1		N/A
	- screen dimensions		N/A
	- no fiercely burning material		P
	- thermal protection		N/A
	- electronic circuits exempted		N/A
3.6 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		N/A
	a) construction		N/A
	b) temperature sensing control		N/A
	c) surface temperature		N/A
3.6 (4.16)	**Luminaires for mounting on normally flammable surfaces**		N/A
	No lamp control gear .....:	(compliance with Section 12)	N/A
	Provided with adaptor for a track meet the requirements for direct mounting on normally flammable surfaces		N/A
3.6 (4.16.1)	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
3.6 (4.16.2)	Thermal protection:		N/A
	- in lamp control gear		N/A
	- external		N/A
	- fixed position		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- temperature marked lamp control gear		N/A
3.6 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N/A
3.6 (4.17)	**Drain holes**		N/A
	Clearance at least 5 mm		N/A
3.6 (4.18)	**Resistance to corrosion**		**P**
3.6 (4.18.1)	- rust-resistance		N/A
3.6 (4.18.2)	- season cracking in copper		N/A
3.6 (4.18.3)	- corrosion of aluminium		P
3.6 (4.19)	Ignitors compatible with ballast		N/A
3.6 (4.20)	Rough service vibration		N/A
3.6 (4.21)	**Protective shield**		N/A
3.6 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A
	Shield of glass if tungsten halogen lamps		N/A
3.6 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
3.6 (4.21.3)	No direct path		N/A
3.6 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment.....:	See Test Table 3.15 (13.3.2)	N/A
3.6 (4.22)	Attachments to lamps not cause overheating or damage		N/A
3.6 (4.23)	Semi-luminaires comply Class II		N/A
3.6 (4.24)	**Photobiological hazards**		**P**
3.6 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N/A
3.6 (4.24.2)	Retinal blue light hazard		P
	Class of risk group assessed according to IEC/TR 62778 .....:	RG1	—
	Luminaires with E_{thr} :		N/A
	a) Fixed luminaires		N/A
	- distance x m, borderline between RG1 and RG2...:		N/A
	- marking and instruction according 3.2.23		N/A
	b) Portable and handheld luminaires		N/A
	- marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Portable luminaires for children IEC 60598-2-10 and Mains socket outlet nightlights IEC 60598-2-12 not exceed RG1 at 200 mm according to IEC/62778		N/A
3.6 (4.25)	**Mechanical hazard**		**P**
	No sharp point or edges		P
3.6 (4.26)	**Short-circuit protection**		N/A
3.6 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N/A
3.6 (4.26.2)	Short-circuit test with test chain according 4.26.3		N/A
	Test chain not melt through		N/A
	Test sample not exceed values of Table 12.1 and 12.2		N/A
3.6 (4.27)	**Terminal blocks with integrated screwless earthing contacts**		N/A
	Test according Annex V		N/A
	Pull test of terminal fixing (20 N)		N/A
	After test, resistance < 0,05 W		N/A
	Pull test of mechanical connection (50 N)		N/A
	After test, resistance < 0,05 W		N/A
	Voltage drop test, resistance < 0,05 W		N/A
3.6 (4.28)	**Fixing of thermal sensing control**		N/A
	Not plug-in or easily replaceable type		N/A
	Reliably kept in position		N/A
	No adhesive fixing if UV radiations from a lamp can degrade the fixing		N/A
	Not outside the luminaire enclosure		N/A
	Test of adhesive fixing:		N/A
	Max. temperature on adhesive material (°C) .....:		—
	100 cycles between t min and t max		N/A
	Temperature sensing control still in position		N/A
3.6 (4.29)	**Luminaires with non-replaceable light source**		N/A
	Not possible to replace light source		N/A
	Live part not accessible after parts have been opened by hand or tools		N/A
3.6 (4.30)	**Luminaires with non-user replaceable light source**		N/A
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Minimum two fixing means		N/A
3.6 (4.31)	**Insulation between circuits**		**P**
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3		P
	Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfil requirements according 4.31.1 – 4.31.3		N/A
3.6 (4.31.1)	SELV circuits		P
	Used SELV source		P
	Voltage ≤ ELV		P
	Insulating of SELV circuits from LV supply		P
	Insulating of SELV circuits from other non SELV circuits		N/A
	Insulating of SELV circuits from FELV		N/A
	Insulating of SELV circuits from other SELV circuits		N/A
	SELV circuits insulated from accessible parts according Table X.1		P
	Plugs not able to enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Plugs and socket-outlets does not have protective conductor contact		N/A
3.6 (4.31.2)	FELV circuits		N/A
	Used FELV source		N/A
	Voltage ≤ ELV		N/A
	Insulating of FELV circuits from LV supply		N/A
	FELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Socket-outlets does not have protective conductor contact		N/A
3.6 (4.31.3)	Other circuits		N/A
	Other circuits insulated from accessible parts according Table X.1		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		N/A
	- conductive parts are connected together		N/A
	- test according 7.2.3		N/A
	- conductive part not cause an electric shock in case of an insulation fault		N/A
	- equipotential bonding in master/slave applications		N/A
	- master luminaire provided with terminal for accessible conductive parts of slave luminaires		N/A
	- slave luminaire constructed as class I		N/A
3.6 (4.32)	**Overvoltage protective devices**		**P**
	Comply with IEC 61643-11		P
	External to controlgear and connected to earth:		P
	- only in fixed luminaires		P
	- only connected to protective earth		P
3.6.1 (-)	At least IP X3 or X5 respectively. IP ..... :	IP66	P
	Column-integrated luminaires:		N/A
	- parts below 2,5 m. IP ..... :		N/A
	- parts above 2,5 m. IP ..... :		N/A
3.6.2 (-)	Suspension on span wires		N/A
3.6.3 (-)	Means for attaching the luminaire or external parts to its support appropriate to the weight		P
3.6.3.1 (-)	Static load test		P
	- drag coefficient..... :	1,2	P
	- loaded area (m^2)..... :	BML-2018A 300W: 0,35 BML-2018B 150W: 0,27 BML-2018C 60W: 0,15	P
	- used load (N)..... :	BML-2018A 300W: 696 BML-2018B 150W: 534 BML-2018C 60W: 224	P
	- measured deformation (cm/m) ..... :	BML-2018A 300W: 0,6 BML-2018B 150W: 0,5 BML-2018C 60W: 0,3 (limit 2cm/m)	P
	- no rotation		P
3.6.4 (-)	Adjustable lampholders		N/A
3.6.5 (-)	Luminaires installed above 5 m, glass covers shall be:		P

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Clause	Requirement + Test	Result - Remark	Verdict
	a) glass that fractures into small pieces (test according to 3.6.5.1), or		P
	b) glass having a high impact shock resistance (test according to 3.6.5.2), or		N/A
	c) protected by any means to retain glass fragments		N/A
	For tunnel luminaires 3.6.5.1 apply		N/A
	Method of protection declared by the manufacturer		P
3.6.5.1 (-)	Protection by the use of glass that fractures into small pieces		P
	- number of particles is more than 40..... :	62	P
3.6.5.2 (-)	Protection by the use of high impact resistant glass		N/A
3.6.5.2.1 (-)	Glass covers have high mechanical strength		N/A
	Test according IEC 62262 with test apparatus according IEC 60068-2-75 with impact energy of 5J on preconditioned sample		N/A
3.6.5.2.2 (-)	Glass covers not break into large pieces		N/A
	- test according 3.6.5.1, number of particles is more than 20..... :		N/A
3.6.6 (-)	Connection compartment of column-integrated luminaire		N/A
	- provides adequate space		N/A
	- means for attachment		N/A
	- means for attachment of metal corrosion-resistant		N/A
3.6.7 (-)	Compliance with ISO standard or other..... :		N/A
3.6.8 (-)	Doors of column-integrated luminaires:		N/A
	- corrosion-resistant		N/A
	- opening only possible for an authorized person		N/A
	- impact test 5 Nm		N/A
	- sample show no damage		N/A
3.6.9 (-)	Column-integrated luminaire:		N/A
	- dimension of the cable entry slot (mm)..... :		N/A
	- cable path from the slot to the connection compartment (mm) ..... :		N/A
	- cable path free from obstruction that might cause abrasion of the cable		N/A

3.7 (11)	**CREEPAGE DISTANCES AND CLEARANCES**		¾
3.7 (11.2.1)	Impulse withstand category (Normal category II)	Category II ☒ Category III ☐	¾

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Clause	Requirement + Test	Result - Remark	Verdict
	Category III according Annex U		N/A
	Protected against pollution, reduced creepage and clearance according Annex P of IEC 61347-1		N/A
3.7 (11.2.2)	Creepage distances for frequency up to 30 kHz	See Test Table 3.7 (11.2) I	P
	Creepage distances for frequency over 30 kHz:		N/A
	- Controlgear marked with $\hat{U}_{OUT}$ and f_{UOUT} according IEC 61347-1, clause 7.1, item w	See Test Table 3.7 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 3.7 (11.2) II	N/A
3.7 (11.2.3)	Clearances for frequency up to 30 kHz	See Test Table 3.7 (11.2) I	P
	Clearances distances for frequency over 30 kHz:		N/A
	- Controlgear marked with U_P	See Test Table 3.7 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 3.7 (11.2) II	N/A
3.8 (7)	**PROVISION FOR EARTHING**		¾
3.8 (7.2.1 + 7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		P
	Resistance < 0,5 W.....:	Max. 0,082W	P
	Self-tapping screws used		N/A
	Thread-forming screws		N/A
	Thread-forming screw used in a grove		N/A
	Earth makes contact first		N/A
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
	Protective earthing of the luminaire not via built-in control gear		P
3.8 (7.2.2 + 7.2.3)	Earth continuity in joints, etc.		P
3.8 (7.2.4)	Locking of clamping means		P
	Compliance with 4.7.3		P
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
3.8 (7.2.5)	Earth terminal integral part of connector socket		N/A
3.8 (7.2.6)	Earth terminal adjacent to mains terminals		P
3.8 (7.2.7)	Electrolytic corrosion of the earth terminal		P

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Clause	Requirement + Test	Result - Remark	Verdict
3.8 (7.2.8)	Material of earth terminal		P
	Contact surface bare metal		P
3.8 (7.2.10)	Class II luminaire for looping-in		N/A
	Double or reinforced insulation to functional earth		N/A
3.8 (7.2.11)	Earthing core coloured green-yellow		P
	Length of earth conductor		P
3.8.1 (-)	Attachment prevented from rotation		N/A
3.9 (14)	**SCREW TERMINALS**		¾
	Separately approved; component list	(see Annex 1)	P
	Part of the luminaire	(see Annex 3)	N/A
3.9 (15)	**SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS**		¾
	Separately approved; component list.....:	(see Annex 1)	P
	Part of the luminaire .....:	(see Annex 4)	N/A
3.10 (5)	**EXTERNAL AND INTERNAL WIRING**		¾
3.10 (5.2)	**Supply connection and external wiring**		**P**
3.10 (5.2.1)	Means of connection.....:	Supply cord	P
	Outdoor luminaire has not PVC insulated external wiring if not class III or SELV ≤ 25 V a.c./60 V d.c. or protected from outdoor environment		N/A
3.10 (5.2.2)	Type of cable.....:	See annex 1	P
	Nominal cross-sectional area (mm²).....:	See annex 1	P
	Cables equal to IEC 60227 or IEC 60245	IEC 60245	P
3.10 (5.2.3)	Type of attachment, X, Y or Z	Type Y	P
3.10 (5.2.5)	Type Z not connected to screws		N/A
3.10 (5.2.6)	Cable entries:		P
	- 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:		N/A
	- suitably fixed		N/A
	- material in bushings		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- material not likely to deteriorate		N/A
	- tubes or guards made of insulating material		N/A
3.10 (5.2.9)	Locking of screwed bushings		N/A
3.10 (5.2.10)	Cord anchorage:		P
	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		P
	- no tying of cables into knots etc.		P
	- insulating material or lining		P
3.10 (5.2.10.1)	Cord anchorage for type X attachment:		N/A
	a) at least one part fixed		N/A
	b) types of cable		N/A
	c) no damaging of the cable		N/A
	d) whole cable can be mounted		N/A
	e) no touching of clamping screws		N/A
	f) metal screw not directly on cable		N/A
	g) replacement without special tool		N/A
	Glands not used as anchorage		N/A
	Labyrinth type anchorages		N/A
3.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment	Type Y	P
3.10 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N) .....:	60N	P
	- torque test: torque (Nm).....:	0,25Nm	P
	- displacement £ 2 mm		P
	- no movement of conductors		P
	- no damage of cable or cord		P
	- function independent of electrical connection		N/A
3.10 (5.2.11)	External wiring passing into luminaire		P
3.10 (5.2.12)	Looping-in terminals		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
3.10 (5.2.13)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N/A
3.10 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A
3.10 (5.2.16)	Appliance inlets (IEC 60320)		N/A
	Installation couplers (IEC 61535)		N/A
	Other appliance inlet or connector according relevant IEC standard		N/A
3.10 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
3.10 (5.2.18)	Used plug in accordance with		N/A
	- IEC 60083		N/A
	- other standard		N/A
3.10 (5.3)	**Internal wiring**		**P**
3.10 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		N/A
	- not delivered/ mounting instruction		N/A
	- factory assembled		N/A
	- socket outlet loaded (A).....:		N/A
	- temperatures.....:	(see Annex 2)	N/A
	Green-yellow for earth only		P
3.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P
	Cross-sectional area (mm²) .....:	See annex 1	P
	Insulation thickness (mm) .....:	See annex 1	P
	Extra insulation added where necessary		N/A
3.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		P
	Cross-sectional area (mm²) .....:	See annex 1	P
3.10 (5.3.1.3)	Double or reinforced insulation for class II		N/A
3.10 (5.3.1.4)	Conductors without insulation		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
3.10 (5.3.1.5)	SELV current-carrying parts		P
3.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
3.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N/A
	Joints, raising/lowering devices		N/A
	Telescopic tubes etc.		N/A
	No twisting over 360°		P
3.10 (5.3.3)	Insulating bushings:		N/A
	- suitable fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- cables with protective sheath		N/A
3.10 (5.3.4)	Joints and junctions effectively insulated		N/A
3.10 (5.3.5)	Strain on internal wiring		N/A
3.10 (5.3.6)	Wire carriers		N/A
3.10 (5.3.7)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N/A
3.10 (5.4)	**Test to determine suitability of conductors having a reduced cross-sectional area**		N/A
	Under test the temperature of the luminaire wiring insulation not exceed the limits stated in Table 12.2		N/A
	No damage to luminaire wiring after test		N/A
3.10.1 (-)	Cord anchorage if applicable		P
	- pull test: 25 times; pull (N) ..... :	60N	P
	- torque test: torque (Nm)..... :	0,25Nm	P

3.11 (8)	**PROTECTION AGAINST ELECTRIC SHOCK**		¾
3.11 (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		N/A
	Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements		N/A
	Basic insulation only accessible under lamp or starter replacement		N/A
	Protection in any position		P
	Double-ended tungsten filament lamp		N/A
	Insulation lacquer not reliable		N/A
	Double-ended high-pressure discharge lamp		N/A
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
3.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
3.11 (8.2.3.a)	Class II luminaire:		N/A
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A
	- basic insulation not accessible other than during starter or lamp replacement		N/A
	- glass protective shields not used as supplementary insulation		N/A
3.11 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N/A
3.11 (8.2.3.c)	SELV circuits with exposed current carrying parts:		N/A
	Ordinary luminaire:		N/A
	- voltage under load (V) .....:		N/A
	- no-load voltage (V) .....:		N/A
	- touch current if applicable (mA) .....:		N/A
	One conductive part insulated if required		N/A
	Other than ordinary luminaire:		N/A
	- nominal voltage (V) .....:		N/A
	Class III luminaire only for connection to SELV		N/A
	Class III luminaire not provided with means for protective earthing		N/A
3.11 (8.2.4)	Portable luminaire has protection independent of supporting surface		N/A
3.11 (8.2.5)	Compliance with the standard test finger or relevant probe		P

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Clause	Requirement + Test	Result - Remark	Verdict
3.11 (8.2.6)	Covers reliably secured		P
3.11 (8.2.7)	Luminaire other than below with capacitor > 0,5 mF not exceed 50 V 1 min after disconnection		P
	Portable luminaire with capacitor > 0,1 mF (0.25) not exceed 34 V 1 s after disconnection		N/A
	Other luminaires with capacitor > 0,1 mF (0.25) with plug and track adaptors not exceed 60 V 5 s after disconnection		N/A
3.12 (12)	**ENDURANCE TEST AND THERMAL TEST**		¾
3.12.2 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 3.13		¾
3.12 (12.2)	**Selection of lamps and ballasts**		¾
	Lamp used according Annex B	(Lamp used see Annex 2)	¾
	Controlgear if separate and not supplied	(Controlgear used see Annex 2)	¾
3.12 (12.3)	**Endurance test**		**P**
	a) mounting-position .....:	As in normal use	¾
	b) test temperature (°C).....:	50	¾
	c) total duration (h) .....:	240	¾
	d) supply voltage (V).....:	264	¾
	d) if not equipped with controlgear, constant voltage/current (V) or (A) .....:	--	¾
	e) luminaire ceases to operate		¾
3.12 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N/A
	- marking legible		P
	- no cracks, deformation etc.		P
3.12 (12.4)	**Thermal test (normal operation)**	(see Annex 2)	P
3.12 (12.5)	**Thermal test (abnormal operation)**	(see Annex 2)	P
3.12 (12.6)	**Thermal test (failed lamp control gear condition):**		N/A
3.12 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A) .....:		¾
	- case of abnormal conditions .....:		¾

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Clause	Requirement + Test	Result - Remark	Verdict
	- electronic lamp control gear		N/A
	- measured winding temperature (°C): at 1,1 Un ....:		¾
	- measured mounting surface temperature (°C) at 1,1 Un .....:		N/A
	- calculated mounting surface temperature (°C) .....:		N/A
	- track-mounted luminaires		N/A
3.12 (12.6.2)	Temperature sensing control		N/A
	- case of abnormal conditions .....:		¾
	- thermal link		N/A
	- manual reset cut-out		N/A
	- auto reset cut-out		N/A
	- measured mounting surface temperature (°C) .....:		N/A
	- track-mounted luminaires		N/A
3.12 (12.7)	**Thermal test (failed lamp control gear in plastic luminaires):**		N/A
3.12 (12.7.1)	Luminaire without temperature sensing control		N/A
3.12 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N/A
	Test method 12.7.1.1 or Annex W .....:		¾
	Test according to 12.7.1.1:		N/A
	- case of abnormal conditions .....:		¾
	- Ballast failure at supply voltage (V) .....:		¾
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
	Test according to Annex W:		N/A
	- case of abnormal conditions .....:		¾
	- measured winding temperature (°C): at 1,1 Un .....:		¾
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un .....:		¾
	- calculated temperature of fixing point/exposed part (°C) .....:		¾
	Ball-pressure test..... :	See Test Table 3.15 (13.2.1)	N/A
3.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N/A
	- case of abnormal conditions .....:		¾

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Clause	Requirement + Test	Result - Remark	Verdict
	- measured winding temperature (°C): at 1,1 Un .....:		¾
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un .....:		¾
	- calculated temperature of fixing point/exposed part (°C) .....:		¾
	Ball-pressure test.....:	See Test Table 3.15 (13.2.1)	N/A
3.12 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N/A
	- case of abnormal conditions .....:		¾
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
3.12 (12.7.2)	Luminaire with temperature sensing control		N/A
	- thermal link.....:	Yes ☐ No ☐	¾
	- manual reset cut-out.....:	Yes ☐ No ☐	¾
	- auto reset cut-out .....:	Yes ☐ No ☐	¾
	- case of abnormal conditions .....:		¾
	- highest measured temperature of fixing point/ exposed part (°C): .....:		¾
	Ball-pressure test:.....:	See Test Table 3.15 (13.2.1)	N/A
3.12.1 (-)	Temperature reduction if for outdoor use only		N/A
3.12.2 (-)	(See above)		¾
3.12.3 (-)	Glass covers used within the thermal limits declared by the glass manufacturer		P

3.13 (9)	**RESISTANCE TO DUST AND MOISTURE**		¾
3.13.1 (-)	If IP > IP 20 the order of tests as specified in clause 3.12		P
3.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP.....:	IP66	¾
	- mounting position during test.....:	As in normal use	¾
	- fixing screws tightened; torque (Nm).....:	2/3 x 2,0Nm for screw fixing lamp cover 2/3 x 3,25Nm for gland	¾
	- tests according to clauses .....:	9.2.2 and 9.2.7	¾
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	b) no talcum in dust-tight luminaire		P
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		P
	c.1) For luminaires without drain holes – no water entry		P
	c.2) For luminaires with drain holes – no hazardous water entry		N/A
	d) no water in watertight or pressure watertight luminaire		N/A
	e) no contact with live parts (IP 2X)		N/A
	e) no entry into enclosure (IP 3X and IP 4X)		N/A
	e) no contact with live parts through drain holes and ventilation slots (IP3X and IP4X)		N/A
	f) no trace of water on part of lamp requiring protection from splashing water		N/A
	g) no damage of protective shield or glass envelope		N/A
3.13 (9.3)	Humidity test 48 h	25°C; R.H. 93%	P
3.14 (10)	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		¾
3.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø .....:	--	¾
	Insulation resistance (MW).....:	--	¾
	SELV		P
	- between current-carrying parts of different polarity:		N/A
	- between current-carrying parts and mounting surface .....:	100MW (required: 1MW)	P
	- between current-carrying parts and metal parts of the luminaire.....:	100MW (required: 1MW)	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....:		N/A
	- Insulation bushings as described in Section 5 .....:		N/A
	Other than SELV		P
	- between live parts of different polarity.....:		N/A
	- between live parts and mounting surface.....:	100MW (required: 2MW)	P
	- between live parts and metal parts.....:	100MW (required: 2MW)	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- between live parts of different polarity through action of a switch.....:		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....:		N/A
	- Insulation bushings as described in Section 5 .....:		N/A
3.14 (10.2.2)	Electric strength test		P
	Dummy lamp		N/A
	Luminaires with ignitors after 24 h test		N/A
	Luminaires with manual ignitors		N/A
	Test voltage (V).....:		N/A
	SELV		P
	- between current-carrying parts of different polarity:		N/A
	- between current-carrying parts and mounting surface .....:	500V	P
	- between current-carrying parts and metal parts of the luminaire.....:	500V	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....:		N/A
	- Insulation bushings as described in Section 5 .....:		N/A
	Other than SELV		P
	- between live parts of different polarity.....:		N/A
	- between live parts and mounting surface.....:	1480V	P
	- between live parts and metal parts.....:	1480V	P
	- between live parts of different polarity through action of a switch.....:		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....:		N/A
	- Insulation bushings as described in Section 5 .....:		N/A
3.14 (10.3)	Touch current or protective conductor current (mA).:	Protective conductor current: 0,99mA (limit 3,5mA)	P

3.15 (13)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		¾
3.15 (13.2.1)	Ball-pressure test.....:	See Test Table 3.15 (13.2.1)	P

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Clause	Requirement + Test	Result - Remark	Verdict
3.15 (13.3.1)	Needle-flame test (10 s) .....:	See Test Table 3.15 (13.3.1)	P
3.15 (13.3.2)	Glow-wire test (650°C).....:	See Test Table 3.15 (13.3.2)	N/A
3.15 (13.4)	Proof tracking test (IEC 60112).....:	See Test Table 3.15 (13.4)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

3.7 (11.2)	TABLE I: Creepage distances and clearances							P
	Minimum distances (mm) for a.c. up to 30 kHz sinusoidal voltages							P
	Applicable part of IEC 60598-1 Table 11.1.A*, 11.1.B* and 11.2*							P
	Insulation type **	Measured clearance	Required		Measured creepage	Required		
			clearance	*Table		creepage	*Table	
Distance 1:	B	10,0	1,5	11.1B	10,0	2,5	11.1.A	
Distance 2:	B	10,0	1,5	11.1B	10,0	2,5	11.1.A	
Distance 3:	B	10,0	1,5	11.1B	10,0	2,5	11.1.A	
Distance 4:	B	2,1	1,4	11.1B	2,1	0,2	11.1.A	
Working voltage (V) ..... :					240V (for distance 1, 2, 3); 120V (for distance 4)			¾
PTI ..... :					< 600 ☒ ≥ 600 ☐			¾
Pulse voltage or U_P if applicable (kV) ..... :					--			¾
Supplementary information: Distance 1: Live part in terminal block to earthed metal enclosure; Distance 2: Live part in SPD to earthed metal enclosure; Distance 3: Live part in quick connector to earthed metal enclosure; Distance 4: Live part in LED module to earthed metal enclosure.								

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

3.7 (11.2)	TABLE II: Creepage distances and clearances							N/A
Minimum distances (mm) for a.c. higher than 30 kHz sinusoidal voltages								
Applicable part of IEC 61347-1 Table 7 and 8* or IEC 60664-4 Table 1 and 2								
Distances	Insulation type **	Measured clearance	Required		Measured creepage	Required		
			clearance	*Table		creepage	*Table	
Distance 1:								
Working voltage (V) ..... :								¾
Frequency if applicable (kHz) ..... :								¾
PTI ..... :					< 600 ☐ ≥ 600 ☐			¾
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :								¾
Supplementary information:								
Distance 2:								
Working voltage (V) ..... :								¾

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Clause	Requirement + Test	Result - Remark	Verdict

Frequency if applicable (kHz) ..... :							¾
PTI ..... :	< 600 ☐ ≥ 600 ☐						¾
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :							¾
Supplementary information:							
Distance 3:							
Working voltage (V) ..... :							¾
Frequency if applicable (kHz) ..... :							¾
PTI ..... :	< 600 ☐ ≥ 600 ☐						¾
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :							¾
Supplementary information:							

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

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Clause	Requirement + Test	Result - Remark	Verdict

3.15 (13.2.1)	**TABLE: Ball Pressure Test of Thermoplastics**				P
Allowed impression diameter (mm) .....:		≤2mm			¾
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)		
DC connector on LED PCB	WENZHOU JKUN CONNECTOR CO LTD	125	0,9		
Supplementary information: --					

3.15 (13.3.1)	**TABLE: Needle-flame test (IEC 60695-11-5)**				P
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
DC connector on LED PCB	WENZHOU JKUN CONNECTOR CO LTD	0	No	0	Pass
Supplementary information: --					

3.15 (13.3.2)	**TABLE: Glow-wire test (IEC 60695-2-11)**				**P**
Glow wire temperature .....:		650°C			¾
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
LED Lens	Covestro Deutschland AG	0	No	0	Pass
Any flame or glowing of the sample extinguished within 30 s of withdrawing the glow-wire, and any burning or molten drop did not ignite the underlying parts (Yes/No).....:					Yes
Supplementary information: --					

3.15 (13.4)	**TABLE: Proof tracking test (IEC 60112)**					**N/A**
Test voltage PTI .....:		175 V				¾
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens				Verdict
--	--	--	--	--		--
Supplementary information: --						

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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 1	TABLE: Critical components information	P

Object/Part No.	code	Manufacturer/ Trademark	Type/Model	Technical Data	Standard	Mark(s) of Conformity1)
LED driver (for model BML-2018C 30W and BML-2018C 40W)	B	INVENTRONICS (Hangzhou) INC.	EUC-035S070SVM	Input: 120-240Vac; 50/60Hz; 0,38A Max. Output: 700mA; 25-64Vdc; Max. 80Vdc; Max. 35W; constant current; ta: 70°C; tc: 90°C; Independent; SELV; Class I; IP67	IEC/EN 61347-1 IEC/EN 61347-2-13	TÜV SÜD B 17 12 79136 216*
LED driver (for model BML-2018C 50W and BML-2018C 60W)	B	INVENTRONICS (Hangzhou) INC.	EUC-060S180SVM	Input: 120-240Vac; 50/60Hz; 0,60AMax.; Output: 1800mA; 20-50Vdc; Max. 63Vdc; Max. 60W; constant current; ta: 55°C; tc: 90°C; Independent; SELV; Class I; IP67	IEC/EN 61347-1, IEC/EN 61347-2-13	TÜV SÜD B 17 09 79136 181*
LED driver (for model BML-2018B 80W)	B	INVENTRONICS (Hangzhou) INC.	EUK-096S210DV	Input: 100-240Vac; 50/60Hz; 1,13A Max. or 127-250Vdc; 0,89A Max.; Output: 2100mA; 24-69Vdc; Max. 89Vdc; Max. 96W; constant current; ta: 60°C; tc: 90°C; Independent; SELV; Class I; IP67	IEC/EN 61347-1, IEC/EN 61347-2-13	TÜV RH ENEC: HN 69258246*
LED driver (for model BML-2018B 100W, BML-2018B 120W and BML-2018B 150W)	B	INVENTRONICS (Hangzhou) INC.	EUK-150S350DV	Input: 100-240Vac; 50/60Hz; 1,65A Max. or 127-250Vdc; 1,3A Max.; Output: 3500mA; 22-61Vdc; Max. 80Vdc; Max. 150W; constant current; ta: 50°C; tc: 85°C; Independent; SELV; Class I; IP67	IEC/EN 61347-1, IEC/EN 61347-2-13	TÜV RH ENEC: HN 69257218*

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Clause	Requirement + Test	Result - Remark	Verdict

Object/Part No.	code	Manufacturer/ Trademark	Type/Model	Technical Data	Standard	Mark(s) of Conformity1)
LED driver (for model BML-2018A 200W, BML-2018A 240W and BML-2018A 300W)	B	INVENTRONICS (Hangzhou) INC.	EUK-320S460DV	Input: 100-240Vac; 50/60Hz; 3,7A Max.; Output: 4,6A; 35-100Vdc; Max. 120Vdc; Max. 320W; constant current; ta: 40°C (Uin<220V~, 127-250Vdc) or ta: 50°C (Uin≥220V~); tc: 85°C; Independent; SELV; Class I; IP67	IEC/EN 61347-1, IEC/EN 61347-2-13	TÜV SÜD ENEC: U6 079136 0254*
Supply cord	B	Zhejiang Jinniu Cable Co.,Ltd	H05RN-F	450/750Vdc, 3 x 1,0 mm²	IEC/EN 50525-2-11	VDE 40028195*
Terminal block	B	Ningbo Jinwei Electrical Technology Co., Ltd.	JN002 ()	400Vac, 16A, 125°C 1,0-2,5 mm²	IEC/EN 61984	VDE 40038746*
Quick connector	B	WAGO Kontakttechnik GmbH&Co.KG	260	450V, 24A, 85°C	IEC/EN 60998-2-2 IEC/EN 60998-1	VDE 40033303*
SPD	B	Guangzhou Haide Lightning Protection Technology Co., Ltd	HD-LED10B	Uc: 320VAC; Uoc:10KV; In: 5KA; Imax: 10KA; Up:1,0KV; ta: 80ºC	IEC/EN 61643-11	TÜV SÜD SG-PT-00005A1*
- Input cord of SPD	B	Zhejiang Jinniu Cable Co.,Ltd	H05RN-F	450/750Vdc, 3 x 1,0 mm²	VDE 0285-525-2-21	VDE 40028195*
Earthing wire	B	DONGGUAN CITY QINDA WIRE CO LTD	1330	600Vac, 200°C, 18AWG	UL 758 IEC/EN 60598-2-3 IEC/EN 60598-1	UL E328821* + tested with appliance#
Lead wire for LED module	B	DONGGUAN CITY QINDA WIRE CO LTD	1015	105°C, 600Vac, 18AWG	UL 758 IEC/EN 60598-2-3 IEC/EN 60598-1	UL E328821* + tested with appliance#

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

Object/Part No.	code	Manufacturer/ Trademark	Type/Model	Technical Data	Standard	Mark(s) of Conformity1)
DC connector on LED module PCB	B	WENZHOU JKUN CONNECTOR CO LTD	L001	250Vac, 2.0A	UL 1977 IEC/EN 60598-2-3 IEC/EN 60598-1	UL E473017* + tested with appliance#
Fiberglass Sleeving	B	HUAPENG (SUZHOU) HEAT-SHRINKABLE MATERIALS CO LTD	H-AFS-XG	VW-1 Silicone-coated	UL 1441 IEC/EN 60598-2-3 IEC/EN 60598-1	UL E338253* + tested with appliance#
PCB	B	SHENZHEN SHENGDAFENG ELECTRONIC TECHNOLOGY CO LTD	SDF-L	V-0, 130°C	UL 796 IEC/EN 60598-2-3 IEC/EN 60598-1	UL E502850* + tested with appliance#
LED	B	Lumileds	LUXEON 3030 2D	V_F=5,8-6,6Vdc, I_F=240mA, CCT 3000-6500K	IEC TR 62778	Tested with appliance#
LED lens	B	Covestro Deutschland AG	FR6002 + (z)	V-0	UL 746 IEC/EN 60598-2-3 IEC/EN 60598-1	UL E41613* + tested with appliance#
Lamp cover	B	CHANGZHOU XIANGDELI TOUGHEN GLASS CO.,LTD	BML-2018	Glass, 0ºC to 180°C, Δt=180ºC	IEC/EN 60598-2-3 IEC/EN 60598-1	Tested with appliance#

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

*License available upon request;

#Please refer summary of testing in TRF for the test standard publication year.

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	TABLE: Thermal tests of Section 12		P
	Type reference .....:	BML-2018A 300W	¾
	Lamp used.....:	LED	¾
	Lamp control gear used .....:	EUK-320S460DV	¾
	Mounting position of luminaire.....:	As in normal use	¾
	Supply wattage (W) .....:	303,2W [240V]	¾
	Supply current (A).....:	1,281A [240V]	¾
	Temperatures in test 1 - 4 below are corrected for ta (°C) .....:	50	¾
	- abnormal operating mode.....:	S/C output of LED driver	¾
1.12 (12.4)	- test 1: rated voltage .....:	240V; 120V	¾
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....:	1,06 x 240V 1,06 x 120V	¾
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....:	--	¾
	Through wiring or looping-in wiring loaded by a current of A during the test .....:	--	¾
1.12 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....:	1,1 x 240V	¾

Temperature measurements (°C)

Part	Ambient	Cl. 12.4 – normal				Cl. 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Supply cord	40	--	46,3	--	90	--	--
Supply cord under cord anchorage	40	--	53,6	--	75	--	--
Terminal block	40	--	59,8	--	125	--	--
Input cable of LED driver	40	--	66,2	--	90	--	--
LED driver tc	40	79,7	--	--	85	--	--
Input cord of SPD	40	--	65,8	--	90	--	--
SPD ambient	40	--	60,5	--	80	--	--
Quick connector	40	--	68,6	--	85	--	--
Output cord of LED driver	40	--	78,3	--	90	--	--

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

DC connector on LED module PCB	40	--	80,3	--	Ref.	--	--
PCB of LED module	40	--	96,5	--	Ref.	--	--
Input wire of LED module	40	--	75,6	--	105	--	--
Lamp cover	40	--	65,4	--	Ref.	--	--
Metal enclosure	40	--	68,2	--	Ref.	--	--
Mounting surface	40	--	44,1	--	90	--	--
Lighting object (0,1)	40	--	46,5	--	90	--	--
Supplementary information: 1. for S/C output of LED driver, the product shut down immediately, so no temperature data was recorded.							

ANNEX 2	**TABLE: Thermal tests of Section 12**		P
	Type reference .....:	BML-2018B 150W	¾
	Lamp used.....:	LED	¾
	Lamp control gear used .....:	EUK-150S350DV	¾
	Mounting position of luminaire.....:	As in normal use	¾
	Supply wattage (W) .....:	152,8W [240V]	¾
	Supply current (A).....:	0,642A [240V]	¾
	Temperatures in test 1 - 4 below are corrected for ta (°C) .....:	50	¾
	- abnormal operating mode.....:	S/C output of LED driver	¾
1.12 (12.4)	- test 1: rated voltage .....:	240V; 120V	¾
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....:	1,06 x 240V 1,06 x 120V	¾
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....:	--	¾
	Through wiring or looping-in wiring loaded by a current of A during the test .....:	--	¾
1.12 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....:	1,1 x 240V	¾

Temperature measurements (°C)							
Part	Ambient	**Cl. 12.4 – normal**				**Cl. 12.5 – abnormal**	
		test 1	test 2	test 3	limit	test 4	limit

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

Supply cord	40	--	44,5	--	90	--	--
Supply cord under cord anchorage	40	--	53,5	--	75	--	--
Terminal block	40	--	54,2	--	125	--	--
Input cable of LED driver	40	--	60,9	--	90	--	--
LED driver tc	40	79,5	--	--	85	--	--
Input cord of SPD	40	--	60,3	--	90	--	--
SPD ambient	40	--	57,1	--	80	--	--
Quick connector	40	--	69,0	--	85	--	--
Output cord of LED driver	40	--	72,3	--	90	--	--
DC connector on LED module PCB	40	--	76,6	--	Ref.	--	--
PCB of LED module	40	--	96,4	--	Ref.	--	--
Input wire of LED module	40	--	70,6	--	105	--	--
Lamp cover	40	--	65,2	--	Ref.	--	--
Metal enclosure	40	--	68,2	--	Ref.	--	--
Mounting surface	40	--	43,9	--	90	--	--
Lighting object (0,1)	40	--	44,3	--	90	--	--

Supplementary information:
1. for S/C output of LED driver, the product shut down immediately, so no temperature data was recorded.

ANNEX 2	**TABLE: Thermal tests of Section 12**		P
	Type reference .....:	BML-2018B 80W	¾
	Lamp used.....:	LED	¾
	Lamp control gear used .....:	EUK-096S210DV	¾
	Mounting position of luminaire.....:	As in normal use	¾
	Supply wattage (W) .....:	81,4W [240V]	¾
	Supply current (A).....:	0,348A [240V]	¾
	Temperatures in test 1 - 4 below are corrected for ta (°C) .....:	50	¾
	- abnormal operating mode.....:	S/C output of LED driver	¾
1.12 (12.4)	- test 1: rated voltage .....:	240V; 120V	¾
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....:	1,06 x 240V 1,06 x 120V	¾

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....:	--	¾
	Through wiring or looping-in wiring loaded by a current of A during the test .....:	--	¾
1.12 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....:	1,1 x 240V	¾

Temperature measurements (°C)

Part	Ambient	Cl. 12.4 – normal				Cl. 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Supply cord	40	--	42,3	--	90	--	--
Supply cord under cord anchorage	40	--	48,0	--	75	--	--
Terminal block	40	--	49,4	--	125	--	--
Input cable of LED driver	40	--	57,9	--	90	--	--
LED driver tc	40	71,4	--	--	90	--	--
Input cord of SPD	40	--	57,2	--	90	--	--
SPD ambient	40	--	51,9	--	80	--	--
Quick connector	40	--	56,6	--	85	--	--
Output cord of LED driver	40	--	54,2	--	90	--	--
DC connector on LED module PCB	40	--	55,4	--	Ref.	--	--
PCB of LED module	40	--	77,8	--	Ref.	--	--
Input wire of LED module	40	--	59,9	--	105	--	--
Lamp cover	40	--	60,2	--	Ref.	--	--
Metal enclosure	40	--	56,1	--	Ref.	--	--
Mounting surface	40	--	42,5	--	90	--	--
Lighting object (0,1)	40	--	44,0	--	90	--	--

Supplementary information:
1. for S/C output of LED driver, the product shut down immediately, so no temperature data was recorded.

ANNEX 2	TABLE: Thermal tests of Section 12		P
	Type reference .....:	BML-2018C 60W	¾
	Lamp used.....:	LED	¾
	Lamp control gear used .....:	EUC-060S180SVM	¾
	Mounting position of luminaire.....:	As in normal use	¾

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

	Supply wattage (W) .....:	62,7W [240V]	¾
	Supply current (A).....:	0,266A [240V]	¾
	Temperatures in test 1 - 4 below are corrected for ta (°C) .....:	50	¾
	- abnormal operating mode.....:	S/C output of LED driver	¾
1.12 (12.4)	- test 1: rated voltage .....:	240V; 120V	¾
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....:	1,06 x 240V 1,06 x 120V	¾
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....:	--	¾
	Through wiring or looping-in wiring loaded by a current of A during the test .....:	--	¾
1.12 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....:	1,1 x 240V	¾

Temperature measurements (°C)

Part	Ambient	Cl. 12.4 – normal				Cl. 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Supply cord	40	--	42,7	--	90	--	--
Supply cord under cord anchorage	40	--	51,4	--	75	--	--
Terminal block	40	--	53,6	--	125	--	--
Input cable of LED driver	40	--	62,3	--	90	--	--
LED driver tc	40	79,2	--	--	90	--	--
Input cord of SPD	40	--	61,8	--	90	--	--
SPD ambient	40	--	58,5	--	80	--	--
Quick connector	40	--	62,5	--	85	--	--
Output cord of LED driver	40	--	69,0	--	90	--	--
DC connector on LED module PCB	40	--	68,7	--	Ref.	--	--
PCB of LED module	40	--	91,9	--	Ref.	--	--
Input wire of LED module	40	--	65,2	--	105	--	--
Lamp cover	40	--	64,6	--	Ref.	--	--
Metal enclosure	40	--	62,1	--	Ref.	--	--
Mounting surface	40	--	43,5	--	90	--	--
Lighting object (0,1)	40	--	43,7	--	90	--	--

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:
1. for S/C output of LED driver, the product shut down immediately, so no temperature data was recorded.

ANNEX 2	TABLE: Thermal tests of Section 12		P
	Type reference .....:	BML-2018C 40W	¾
	Lamp used.....:	LED	¾
	Lamp control gear used .....:	EUC-035S070SVM	¾
	Mounting position of luminaire.....:	As in normal use	¾
	Supply wattage (W) .....:	37,1W [240V]	¾
	Supply current (A).....:	0,151A [240V]	¾
	Temperatures in test 1 - 4 below are corrected for ta (°C) .....:	50	¾
	- abnormal operating mode.....:	S/C output of LED driver	¾
1.12 (12.4)	- test 1: rated voltage .....:	240V; 120V	¾
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....:	1,06 x 240V 1,06 x 120V	¾
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....:	--	¾
	Through wiring or looping-in wiring loaded by a current of A during the test .....:	--	¾
1.12 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....:	1,1 x 240V	¾

Temperature measurements (°C)

Part	Ambient	Cl. 12.4 – normal				Cl. 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Supply cord	40	--	42,9	--	90	--	--
Supply cord under cord anchorage	40	--	47,1	--	75	--	--
Terminal block	40	--	47,8	--	125	--	--
Input cable of LED driver	40	--	58,3	--	90	--	--
LED driver tc	40	73,5	--	--	90	--	--
Input cord of SPD	40	--	58,1	--	90	--	--
SPD ambient	40	--	59,9	--	80	--	--
Quick connector	40	--	58,9	--	85	--	--
Output cord of LED driver	40	--	59,0	--	90	--	--

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

DC connector on LED module PCB	40	--	54,9	--	Ref.	--	--
PCB of LED module	40	--	86,6	--	Ref.	--	--
Input wire of LED module	40	--	59,8	--	105	--	--
Lamp cover	40	--	62,3	--	Ref.	--	--
Metal enclosure	40	--	58,1	--	Ref.	--	--
Mounting surface	40	--	43,1	--	90	--	--
Lighting object (0,1)	40	--	44,2	--	90	--	--
Supplementary information: 1. for S/C output of LED driver, the product shut down immediately, so no temperature data was recorded.							

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 3	**Screw terminals (part of the luminaire)**		¾
(14)	**SCREW TERMINALS**		N/A
(14.2)	Type of terminal.....:		¾
	Rated current (A).....:		¾
(14.3.2.1)	One or more conductors		N/A
(14.3.2.2)	Special preparation		N/A
(14.3.2.3)	Terminal size		N/A
	Cross-sectional area (mm²) .....:		¾
(14.3.3)	Conductor space (mm) .....:		N/A
(14.4)	Mechanical tests		N/A
(14.4.1)	Minimum distance		N/A
(14.4.2)	Cannot slip out		N/A
(14.4.3)	Special preparation		N/A
(14.4.4)	Nominal diameter of thread (metric ISO thread).....:	M	N/A
	External wiring		N/A
	No soft metal		N/A
(14.4.5)	Corrosion		N/A
(14.4.6)	Nominal diameter of thread (mm).....:		N/A
	Torque (Nm).....:		N/A
(14.4.7)	Between metal surfaces		N/A
	Lug terminal		N/A
	Mantle terminal		N/A
	Pull test; pull (N).....:		N/A
(14.4.8)	Without undue damage		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 4	**Screwless terminals (part of the luminaire)**		¾
(15)	**SCREWLESS TERMINALS**		N/A
(15.2)	Type of terminal.....:		¾
	Rated current (A).....:		¾
(15.3.1)	Material		N/A
(15.3.2)	Clamping		N/A
(15.3.3)	Stop		N/A
(15.3.4)	Unprepared conductors		N/A
(15.3.5)	Pressure on insulating material		N/A
(15.3.6)	Clear connection method		N/A
(15.3.7)	Clamping independently		N/A
(15.3.8)	Fixed in position		N/A
(15.3.10)	Conductor size		N/A
	Type of conductor		N/A
(15.5.1)	Terminals internal wiring		N/A
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples).....:	4N	N/A
(15.5.1.2)	Pull test pin or tab terminals (4 N, 4 samples) .....:		N/A
	Insertion force not exceeding 50 N		N/A
(15.5.1.2)	Permanent connections: pull-off test (20 N)		N/A
(15.5.2)	Electrical tests		N/A
	Voltage drop (mV) after 1 h (4 samples).....:		N/A
	Voltage drop of two inseparable joints		N/A
	Number of cycles:		¾
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples) .....:		N/A
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples) .....:		N/A
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples).....:		N/A
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples).....:		N/A
(15.6)	Terminals external wiring		N/A
	Terminal size and rating		N/A
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....:		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

	Pull test pin or tab terminals (4 samples); pull (N) .....:										N/A
(15.6.3.1)	**TABLE: Contact resistance test**										N/A
	Voltage drop (mV) after 1 h										¾
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)	--	--	--	--	--	--	--	--	--	--	
	Voltage drop of two inseparable joints										N/A
	Voltage drop after 10th alt. 25th cycle										N/A
	Max. allowed voltage drop (mV)..... :	--									¾
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)	--	--	--	--	--	--	--	--	--	--	
	Voltage drop after 50th alt. 100th cycle										N/A
	Max. allowed voltage drop (mV)..... :										¾
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)	--	--	--	--	--	--	--	--	--	--	
	Continued ageing: voltage drop after 10th alt. 25th cycle										N/A
	Max. allowed voltage drop (mV)..... :	--									¾
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)	--	--	--	--	--	--	--	--	--	--	
	Continued ageing: voltage drop after 50th alt. 100th cycle										N/A
	Max. allowed voltage drop (mV)..... :	--									¾
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)	--	--	--	--	--	--	--	--	--	--	
Supplementary information: --											

Attachment No. 1

IEC60598_2_3L - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT
IEC 60598-2-3
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES
Luminaires
Part 2: Particular requirements
Section 3: Luminaires for road and street lighting

Differences according to..... : EN 60598-2-3:2003 +A1:2011 used in conjunction with EN 60598-1:2015+A1:2018

Annex Form No. ..... : EU_GD_IEC60598_2_3L

Annex Form Originator..... : Intertek Semko AB

Master Annex Form..... : 2018-12-07

	CENELEC COMMON MODIFICATIONS (EN)		¾
3.6 (4)	**CONSTRUCTION**		¾
3.6 (4.11.6)	Electro-mechanical contact systems		P
3.10 (5)	**EXTERNAL AND INTERNAL WIRING**		¾
3.10 (5.2.2)	Cables equal to EN 50525		P
	Replace table 5.1 – Supply cord		P
3.12 (12)	**ENDURANCE TESTS AND THERMAL TESTS**		¾
3.12 (12.4.2c)	Thermal test (normal operation) see footnote c to table 12.2 relating to unsleeved fixed wiring		P
ZB	**ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)**		¾
(3.3)	DK: power supply cords of class I luminaires with label		N/A
(4.5.1)	DK: socket-outlets		N/A
(5.2.1)	CY, DK, FI, GB: type of plug		N/A
ZC	**ANNEX ZC, NATIONAL DEVIATIONS (EN)**		¾
(4 & 5)	FR: Shuttered socket-outlets 10/16A		N/A
	FR: Safety requirements for high buildings *(Decree of 30 December 2011 on safety regulations for the construction of high-rise buildings and their protection against fire and panic risks; Section VIII; Article GH 48, Lighting)* Glow-wire test for outer parts of luminaires:		N/A
	- 850°C for luminaires in stairways and horizontal travel paths		N/A
	- 650°C for indoor luminaires		N/A
	GB: Requirements according to United Kingdom Building Regulation		N/A

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

TEST REPORT

IEC 62031

LED modules for general lighting – Safety specifications

4	**GENERAL REQUIREMENTS**		¾
4.4	Integral modules tested assembled in the luminaire		P
4.5	Independent modules complies with requirements in IEC 60598-1		N/A

5	**GENERAL TEST REQUIREMENTS**		¾
5.5	SELV-operated LED modules comply with Annex I of IEC 61347-2-13	(see Annex 1)	N/A
	General conditions for tests in Annex A	(see Annex A)	P

6	**CLASSIFICATION**		¾
	Built-in module .....:	Yes ☐ No ☒	¾
	Independent module.....:	Yes ☐ No ☒	¾
	Integral module .....:	Yes ☒ No ☐	¾
	For Integral module; Note to 1.2.1 in IEC 60598-1 applies.		¾

7	**MARKING**		N/A
	Requirements not applicable to the evaluated product.		¾

8	**TERMINALS**		¾
	Screw terminals according section 14 of IEC 60598-1:		N/A
	Separately approved; component list	(see Annex 2)	N/A
	Part of the luminaire	(see Annex 3)	N/A
	Screwless terminals according section 15 of IEC 60598-1:		N/A
	Separately approved; component list	(see Annex 2)	N/A
	Part of the luminaire	(see Annex 4)	N/A
	Connectors according IEC 60838-2-2:		N/A
	Separately approved; component list	(see Annex 2)	N/A

9 (9)	**PROVISION FOR PROTECTIVE EARTHING**		N/A
	Requirements not applicable to the evaluated product.		¾

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
10 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		N/A
	Requirements not applicable to the evaluated product.		¾
11 (11)	**MOISTURE RESISTANCE AND INSULATION**		¾
	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance with d.c. 500 V (MW):		P
	For basic insulation ³ 2 MW .....:	100MW	P
	For double or reinforced insulation ³ 4 MW.....:		N/A
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		N/A
12 (12)	**ELECTRIC STRENGTH**		¾
	Immediately after clause 11 electric strength test for 1 min		P
	Basic insulation for SELV, test voltage 500 V		P
	Working voltage £ 50 V, test voltage 500 V		N/A
	Working voltage > 50 V £ 1000 V, test voltage (V):		N/A
	Basic insulation, 2U + 1000 V		N/A
	Supplementary insulation, 2U + 1000 V		N/A
	Double or reinforced insulation, 4U + 2000 V		N/A
	No flashover or breakdown		P
	Solid or thin sheet insulation for double or reinforced insulation fulfil the requirements in Annex N in IEC 61347-1		N/A
13 (14)	**FAULT CONDITIONS**		¾
- (14)	When operated under fault conditions the controlgear:		N/A
	- does not emit flames or molten material		N/A
	- does not produce flammable gases		N/A
	- protection against accidental contact not impaired		N/A
	Thermally protected controlgear does not exceed the marked temperature value		N/A
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	N/A

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
- (14.1)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (except between live parts and accessible metal parts)	(see appended table)	N/A
	Creepage distances on printed boards less than specified in clause 16 in Part 1 provided with coating according to IEC 60664-3		N/A
- (14.2)	Short-circuit or interruption of semiconductor devices	(see appended table)	N/A
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	N/A
- (14.4)	Short-circuit across electrolytic capacitors	(see appended table)	N/A
- (14.5)	After the tests has been carried out on three samples:		N/A
	The insulation resistance ³ 1 MW ..... :		N/A
	No flammable gases		N/A
	No accessible parts have become live		N/A
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		N/A
- (14.6)	Relevant fault condition tests with high-power supply		N/A
13.2	**Overpower condition**		**P**
	Module withstands overpower condition >15 min.		P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		N/A
	No fire, smoke or flammable gas is produced		P
	Molten material does not ignite tissue paper, spread below the module		P

15	**CONSTRUCTION**		¾
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P

16 (16)	**CREEPAGE DISTANCES AND CLEARANCES**		¾
- (16)	Creepage and distances and clearances in compliance with IEC 61347-1	(see appended table)	N/A
	Insulating lining of metallic enclosures		N/A
	Basic insulation on printed boards tested according to clause 14		N/A
	Distances subjected to both sinusoidal voltage as non-sinusoidal pulses not less than value in Table 16		N/A
	Creepage distances not less than minimum clearance		N/A

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
16 (-)	Conductive accessible parts in compliance with applicable parts of IEC 60598-1		P
17 (17)	**SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS**		¾
	Cl. 17 refer to Cl. 17 of IEC 61347-1 which refer to Cl. 4.11 and 4.12 of IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1)		¾
(4.11)	**Electrical connections**		**P**
(4.11.1)	Contact pressure		P
(4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
(4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
(4.11.4)	Material of current-carrying parts		P
(4.11.5)	No contact to wood or mounting surface		P
(4.11.6)	Electro-mechanical contact systems		N/A
(4.12)	**Mechanical connections and glands**		N/A
(4.12.1)	Screws not made of soft metal		N/A
	Screws of insulating material		N/A
	Torque test: torque (Nm); part.....:		N/A
	Torque test: torque (Nm); part.....:		N/A
	Torque test: torque (Nm); part.....:		N/A
(4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
(4.12.4)	Locked connections:		N/A
	- fixed arms; torque (Nm).....:		N/A
	- lampholder; torque (Nm).....:		N/A
	- push-button switches; torque 0,8 Nm.....:		N/A
(4.12.5)	Screwed glands; force (Nm).....:		N/A
18 (18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		¾
- (18.1)	Ball-pressure test .....:	See Test Table 18 (18.1)	N/A
- (18.2)	Test of printed boards .....:	See Test Table 18 (18.2)	N/A
- (18.3)	Glow-wire test (650°C) .....:	See Test Table 18 (18.3)	N/A
- (18.4)	Needle-flame test (10 s) .....:	See Test Table 18 (18.4)	N/A
- (18.5)	Proof tracking test .....:	See Test Table 18 (18.5)	N/A

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
19 (19)	**RESISTANCE TO CORROSION**		¾
	- test according 4.18.1 of IEC 60598-1		N/A
	- adequate varnish on the outer surface		N/A
20	**INFORMATION FOR LUMINAIRE DESIGN**		¾
	Information in Annex D (informative)		¾
21	**HEAT MANAGEMENT**		¾
21.1	**General**		N/A
	Exchangeability is safeguarded by cap or base		N/A
21.2	**Heat-conducting foil and paste**		N/A
	Heat-conducting foil delivered with the module if necessary		N/A
22	**PHOTOBIOLOGICAL SAFETY**		¾
22.1	**UV radiation**		N/A
	Luminous radiation not exceed 2mW/klm		N/A
22.2	**Blue light hazard**		**P**
	Assessed according to IEC TR 62778	RG1	P
22.3	**Infrared radiation**		N/A
	Requirements for infrared radiation when required		N/A
A	**ANNEX A - TESTS**		¾
	All tests performed in accordance with the advice given in Annex H of IEC 61347-1, if applicable		N/A

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 1	**SELV-operated LED modules**	¾
	Cl. 5.5 refer to ANNEX I of IEC 61347-2-13 which refer to ANNEX L of IEC 61347-1 (clause numbers between parentheses refer to ANNEX L of IEC 61347-1)	N/A

ANNEX 3	**Screw terminals (part of the luminaire)**		¾
(14)	**SCREW TERMINALS**		N/A
(14.2)	Type of terminal.....:		¾
	Rated current (A).....:		¾
(14.3.2.1)	One or more conductors		N/A
(14.3.2.2)	Special preparation		N/A
(14.3.2.3)	Terminal size		N/A
	Cross-sectional area (mm²) .....:		¾
(14.3.3)	Conductor space (mm) .....:		N/A
(14.4)	Mechanical tests		N/A
(14.4.1)	Minimum distance		N/A
(14.4.2)	Cannot slip out		N/A
(14.4.3)	Special preparation		N/A
(14.4.4)	Nominal diameter of thread (metric ISO thread).....:	M	N/A
	External wiring		N/A
	No soft metal		N/A
(14.4.5)	Corrosion		N/A
(14.4.6)	Nominal diameter of thread (mm).....:		N/A
	Torque (Nm).....:		N/A
(14.4.7)	Between metal surfaces		N/A
	Lug terminal		N/A
	Mantle terminal		N/A
	Pull test; pull (N).....:		N/A
(14.4.8)	Without undue damage		N/A

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 4	**Screwless terminals (part of the luminaire)**		
(15)	**SCREWLESS TERMINALS**		N/A
(15.2)	Type of terminal.....:		¾
	Rated current (A).....:		¾
(15.3.1)	Material		N/A
(15.3.2)	Clamping		N/A
(15.3.3)	Stop		N/A
(15.3.4)	Unprepared conductors		N/A
(15.3.5)	Pressure on insulating material		N/A
(15.3.6)	Clear connection method		N/A
(15.3.7)	Clamping independently		N/A
(15.3.8)	Fixed in position		N/A
(15.3.10)	Conductor size		N/A
	Type of conductor		N/A
(15.5.1)	Terminals internal wiring		N/A
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples).....:		N/A
(15.5.1.2)	Pull test pin or tab terminals (4 N, 4 samples) .....:		N/A
	Insertion force not exceeding 50 N		N/A
(15.5.1.2)	Permanent connections: pull-off test (20 N)		N/A
(15.5.2)	Electrical tests		N/A
	Voltage drop (mV) after 1 h (4 samples).....:		N/A
	Voltage drop of two inseparable joints		N/A
	Number of cycles:		¾
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples) .....:		N/A
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples) .....:		N/A
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples).....:		N/A
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples).....:		N/A
(15.6)	Terminals and connections for external wiring		N/A
(15.6.1)	Conductors		N/A
	Terminal size and rating		N/A
(15.6.2)	Mechanical tests		N/A

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....:		N/A
(15.6.2.2)	Pull test pin or tab terminals (4 samples); pull (N) .....:		N/A
(15.6.3)	Electrical tests		N/A
	Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1		N/A

(15.6.3.1) (15.6.3.2)	**TABLE: Contact resistance test / Heating tests**									N/A
	Voltage drop (mV) after 1 h									¾
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										
	Voltage drop of two inseparable joints									N/A
	Voltage drop after 10th alt. 25th cycle									N/A
	Max. allowed voltage drop (mV)..... :									¾
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										
	Voltage drop after 50th alt. 100th cycle									N/A
	Max. allowed voltage drop (mV)..... :									¾
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										
	Continued ageing: voltage drop after 10th alt. 25th cycle									N/A
	Max. allowed voltage drop (mV)..... :									¾
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										
	Continued ageing: voltage drop after 50th alt. 100th cycle									N/A
	Max. allowed voltage drop (mV)..... :									¾
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										
Supplementary information:										

IEC 62031E ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 62031 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES LED modules for general lighting – Safety specifications
Differences according to..... : EN 62031:2008+A1:2013+A2:2015

	CENELEC COMMON MODIFICATIONS (EN)	N/A
	No Common modifications	N/A

ZB	**ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)**		N/A
	No special National conditions		N/A

ZC	**ANNEX ZC, NATIONAL DEVIATIONS (EN)**		N/A
	No National deviations		N/A

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

TEST REPORT
IEC TR 62778
Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires

7	**MEASUREMENT INFORMATION FLOW**		¾
7.1	**Basic flow**		**P**
	'Law of conservation of luminance' applied		P
	Use of only true luminance/radiance values		P
	In case of luminaire: The light source is operated in the luminaire under similar conditions as when tested as a component		P
	In case E_{thr} value for RG2 was established the peak value was derived from angular light distribution		N/A
7.2	**Conditions for the radiance measurement**		**P**
	Standard condition applied (200mm distance, 0,011rad field of view)		P
	Non-standard condition applied		N/A
7.3	**Special cases (I): Replacement by a lamp or LED module of another type**		**N/A**
	Light source is a white light source		N/A
	Evaluation done based on highest luminance		N/A
	Evaluation done based on CCT value		N/A
7.4	**Special cases (II): Arrays and clusters of primary light sources**		**N/A**
	LED package is evaluated as .....:	☐ RG0 unlimited ☐ RG1 unlimited	N/A
	E_{thr} of LED package applies to array		N/A

8	**RISK GROUP CLASSIFICATION**		¾
	Risk group achieved:		P
	-...Risk Group 0 unlimited		N/A
	-...Risk Group 1 unlimited		P
	- E_{thr} ..... (lx) : Distance to reach RG1..... (m) :		N/A

Attachment No.3

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

	TABLE: Spectroradiometric measurement		**P**
	Measurement performed on:	☐ **LED package** ☐ **LED module** ☐ **Lamp** ☒ **Luminaires**	
	Model number ..... :	BML-2018A 300W	
	Test voltage (V) ..... :	240VAC	¾
	Test current (mA) ..... :	1309	¾
	Test frequency (Hz) ..... :	50Hz	¾
	Ambient, t (°C) ..... :	24,5°C	¾
	Measurement distance ..... :	☒ 20 cm ☐ ... cm	¾
	Source size ..... :	☒ Non-small ☐ Small: .... mm	¾
	Field of view ..... :	☐ 100 mrad ☒ 11 mrad ☐ 1,7 mrad (for small sources)	¾

Item	Symbol	Units	Result	Remark
Correlated colour temperature	CCT	K	--	--
x/y colour coordinates		--	--	--
Blue light hazard radiance	L_B	W/(m²•sr¹)	*362,5*	--
Blue light hazard irradiance	E_B	W/m²	--	--
Luminance	L	cd/m²	3172000	--
Illuminance	E	lx	--	--
Supplementary information: --				

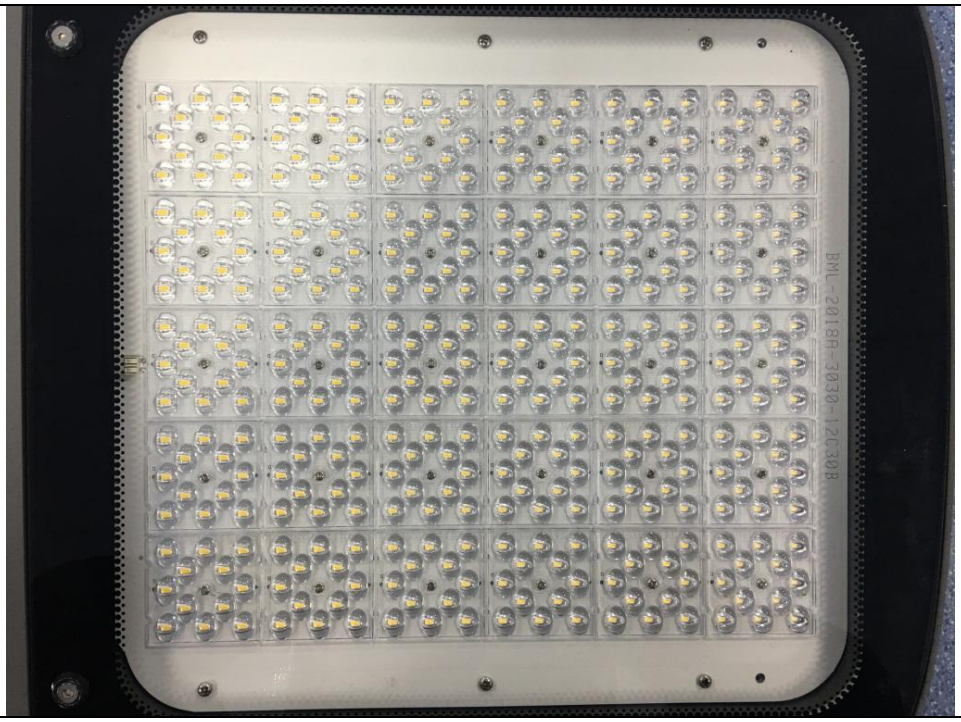
Attachment No. 4

Details of: Overview for model BML-2018A 300W

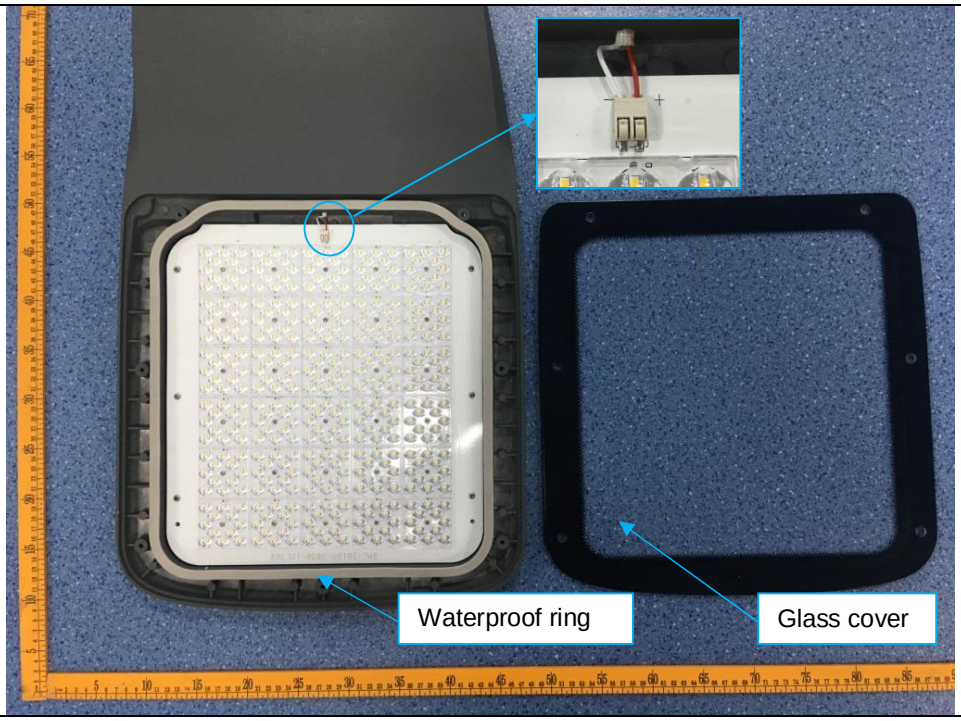
Details of: Back view for model BML-2018A 300W

Attachment No. 4

Details of: LED module overview for model BML-2018A 300W
Remark:

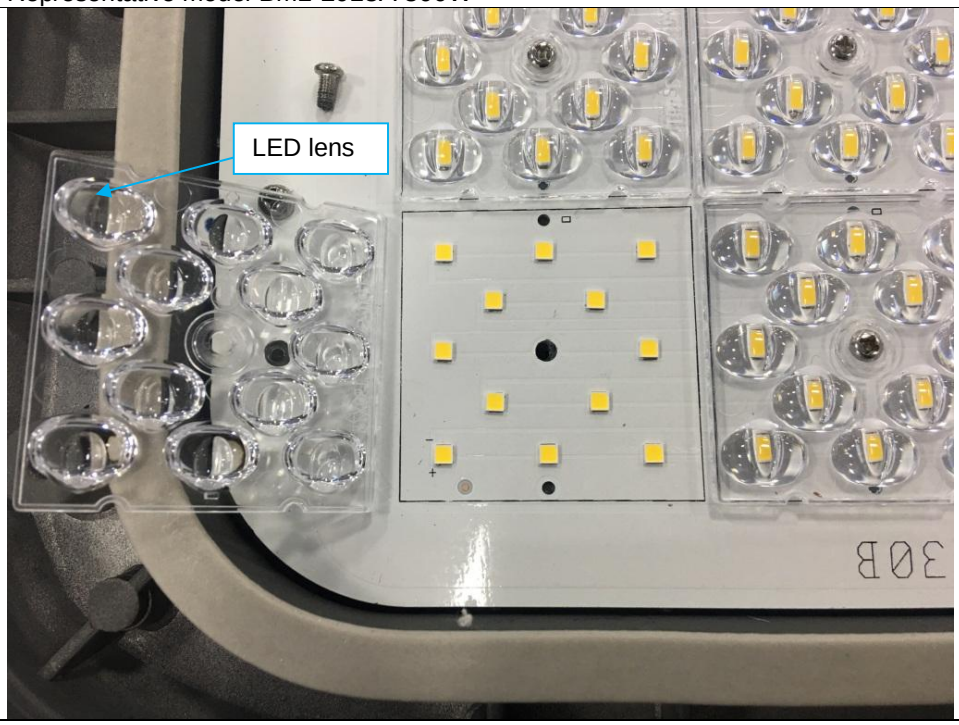


Details of: Internal view for model BML-2018A 300W
Remark:

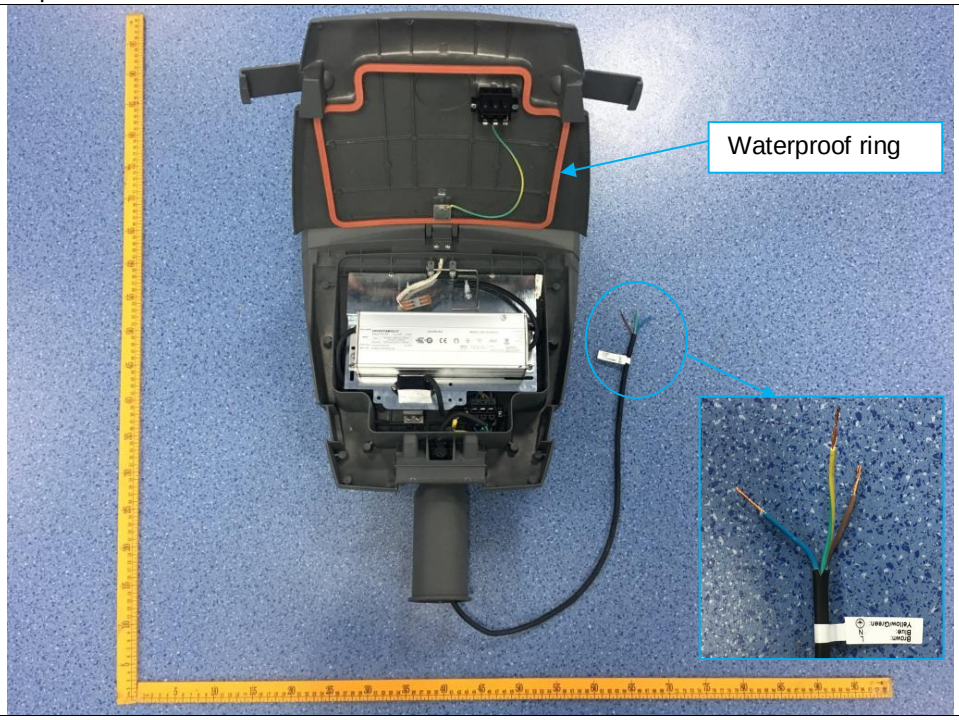


Attachment No. 4

Details of: Internal view for all models
Remark: Representative model BML-2018A 300W

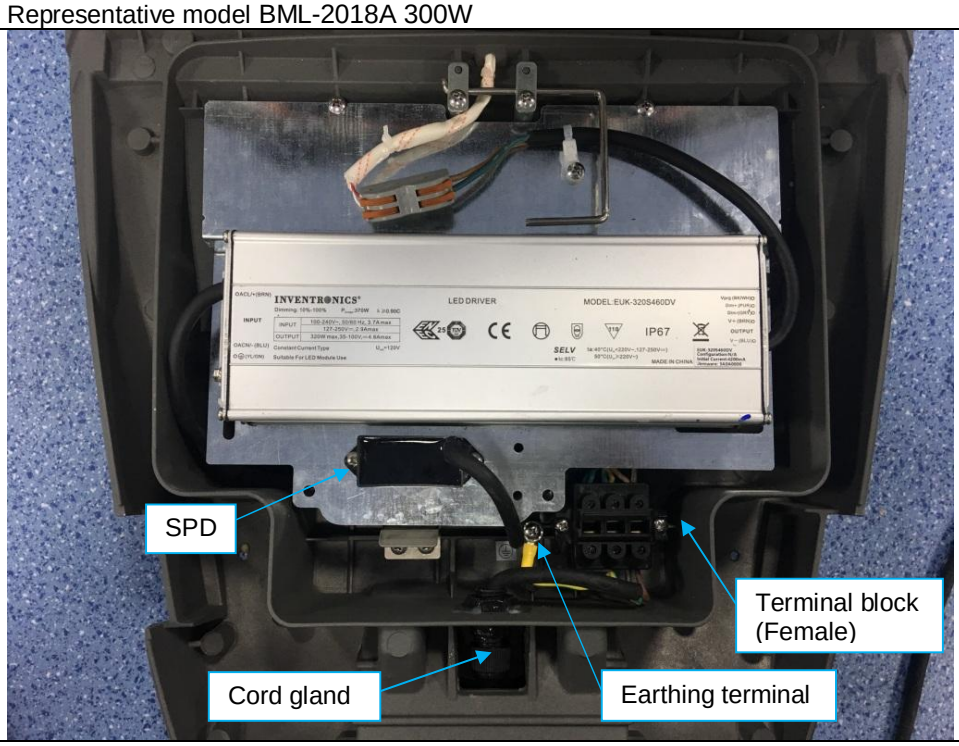


Details of: Internal view for all models
Remark: Representative model BML-2018A 300W

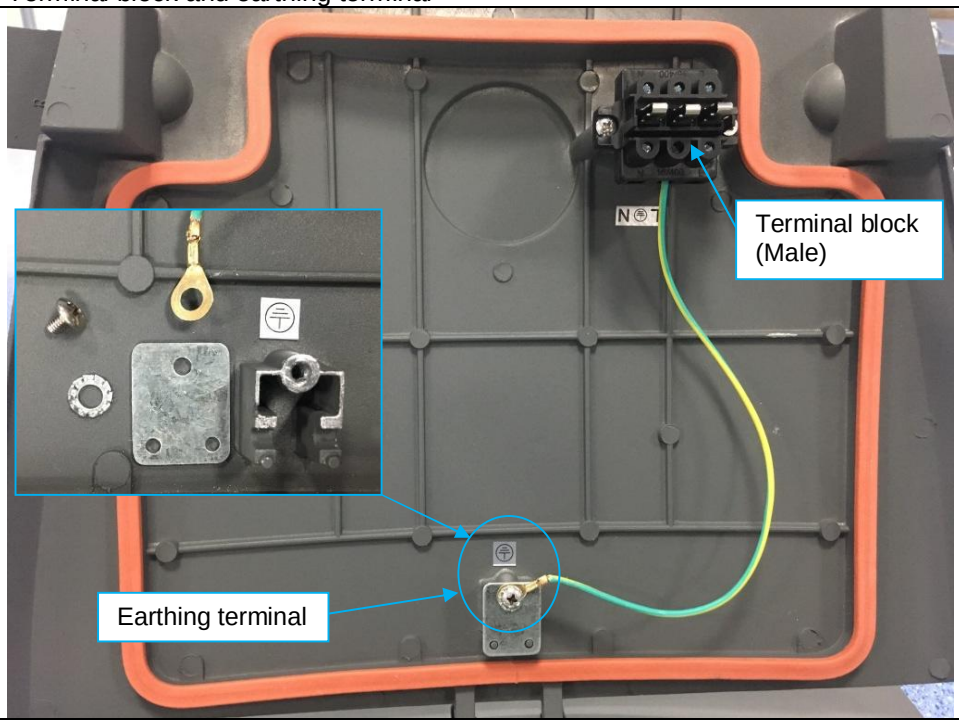


Attachment No. 4

Details of: Internal view for all models
Remark: Representative model BML-2018A 300W



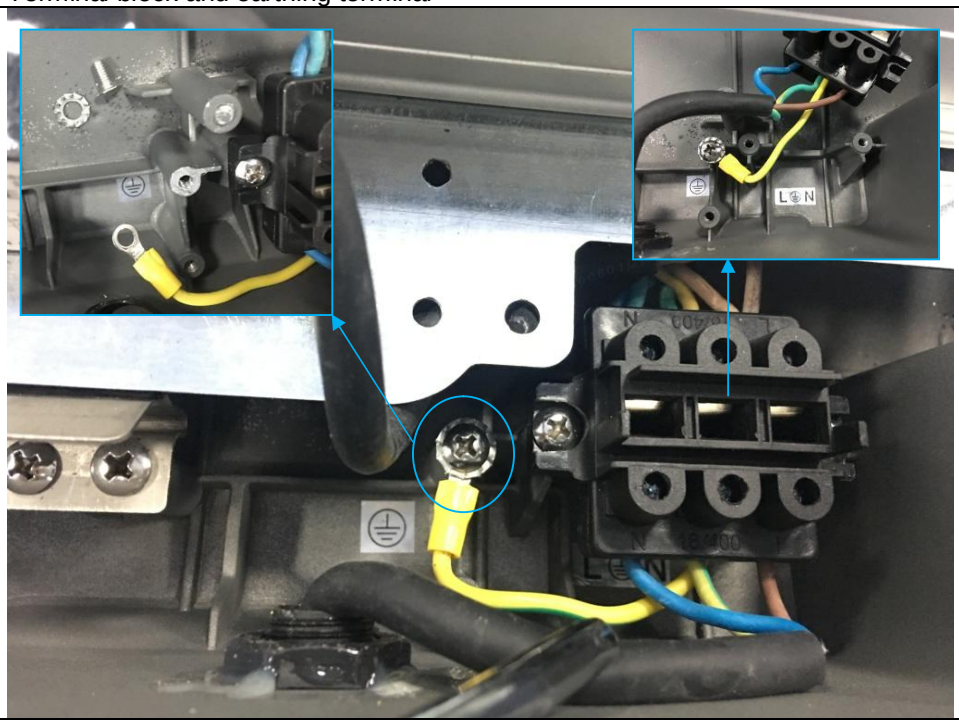
Details of: Internal view for all models
Remark: Terminal block and earthing terminal



Attachment No. 4

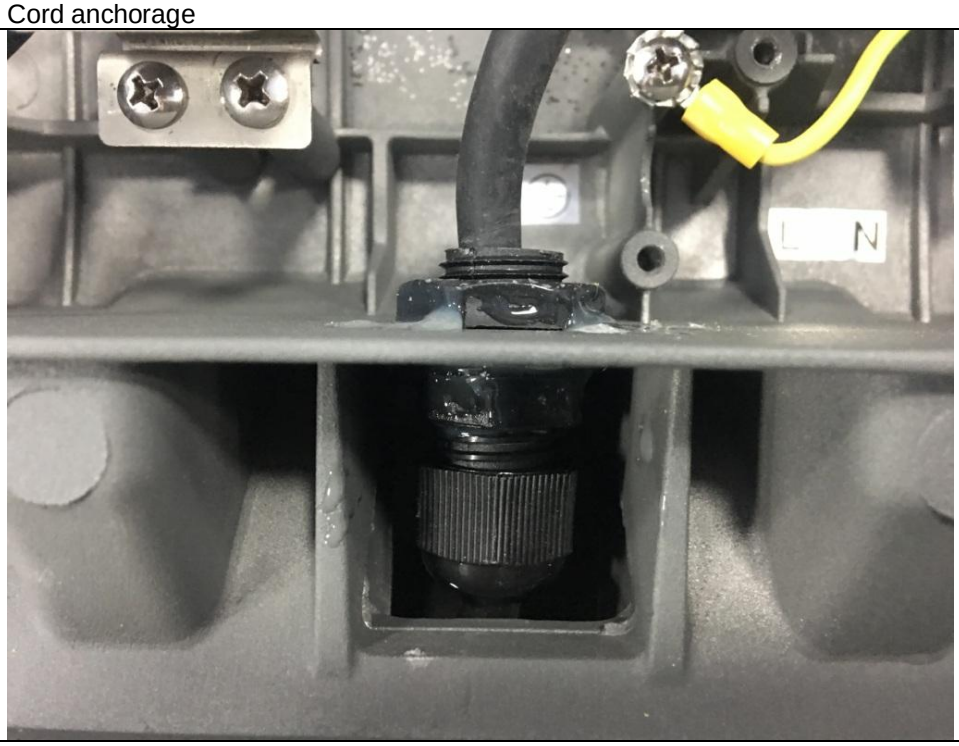
Details of: SPD for all models
Remark:

Details of: Internal view for all models
Remark: Terminal block and earthing terminal

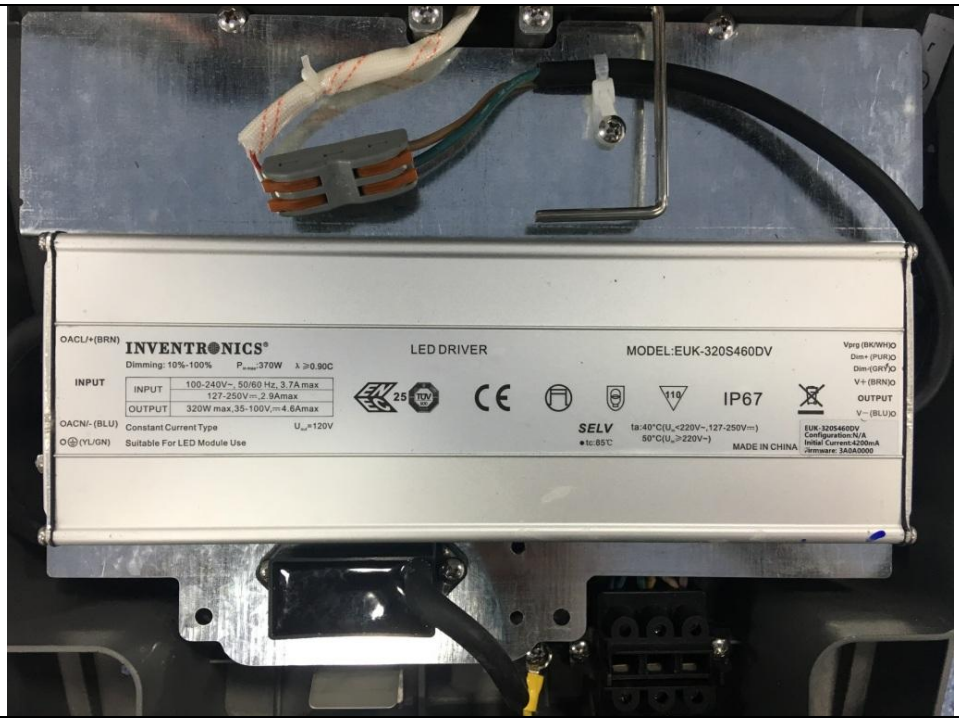


Attachment No. 4

Details of: Internal view for all models
Remark: Cord anchorage

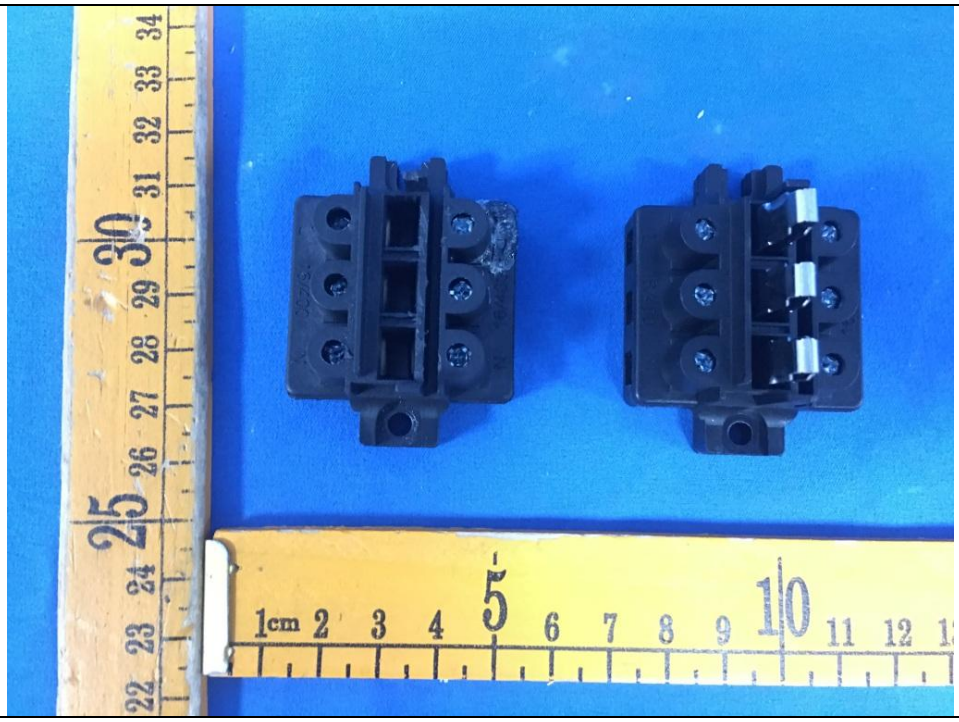


Details of: LED driver for model BML-2018A 300W
Remark:



Attachment No. 4

Details of: Terminal block view for all models
Remark:



Details of: Overview for model BML-2018B 150W
Remark:

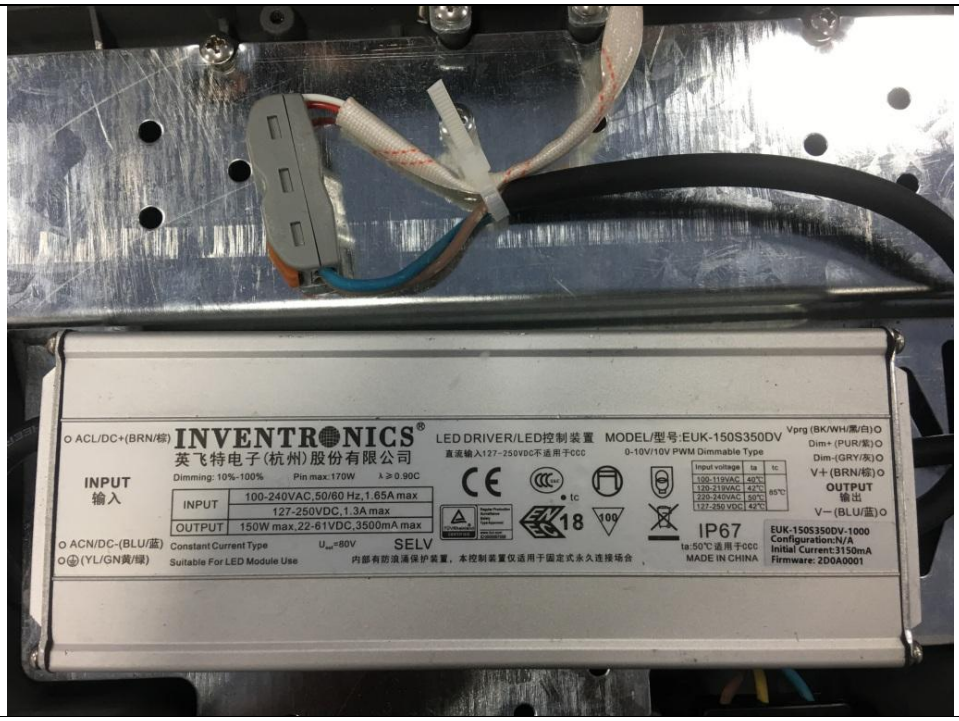
Attachment No. 4

Details of: Back view for model BML-2018B 150W
Remark:

Details of: LED module overview for model BML-2018B 150W
Remark:

Attachment No. 4

Details of: LED driver overview for model BML-2018B 150W
Remark:



Details of: Overview for model BML-2018B 80W
Remark:

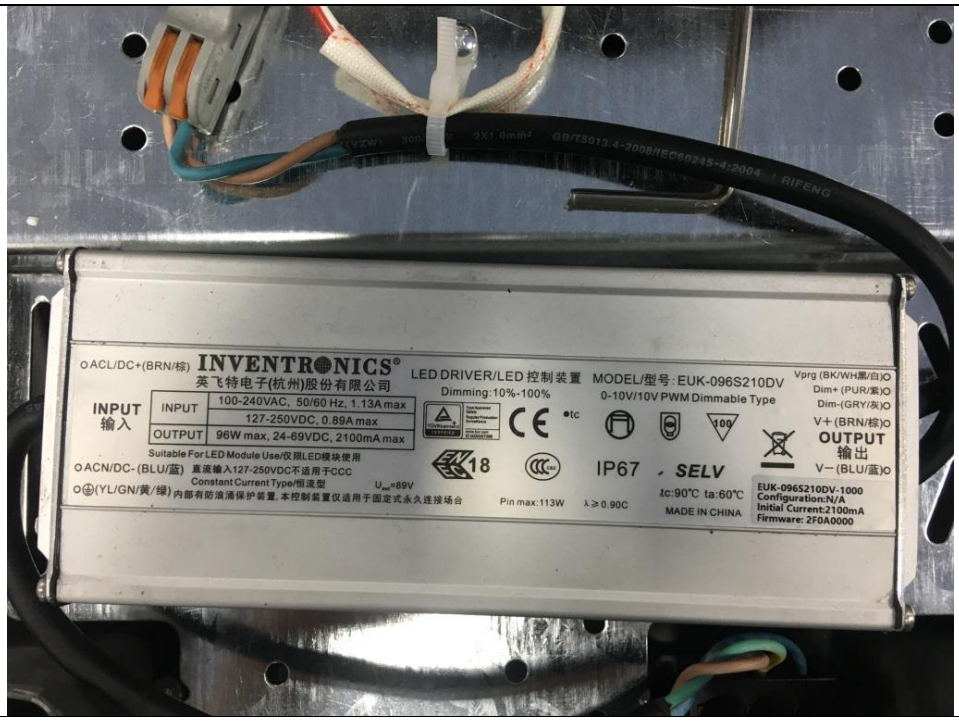
Attachment No. 4

Details of: Back view for model BML-2018B 80W
Remark:

Details of: LED module overview for model BML-2018B 80W
Remark:

Attachment No. 4

Details of: LED driver overview for model BML-2018B 80W
Remark:

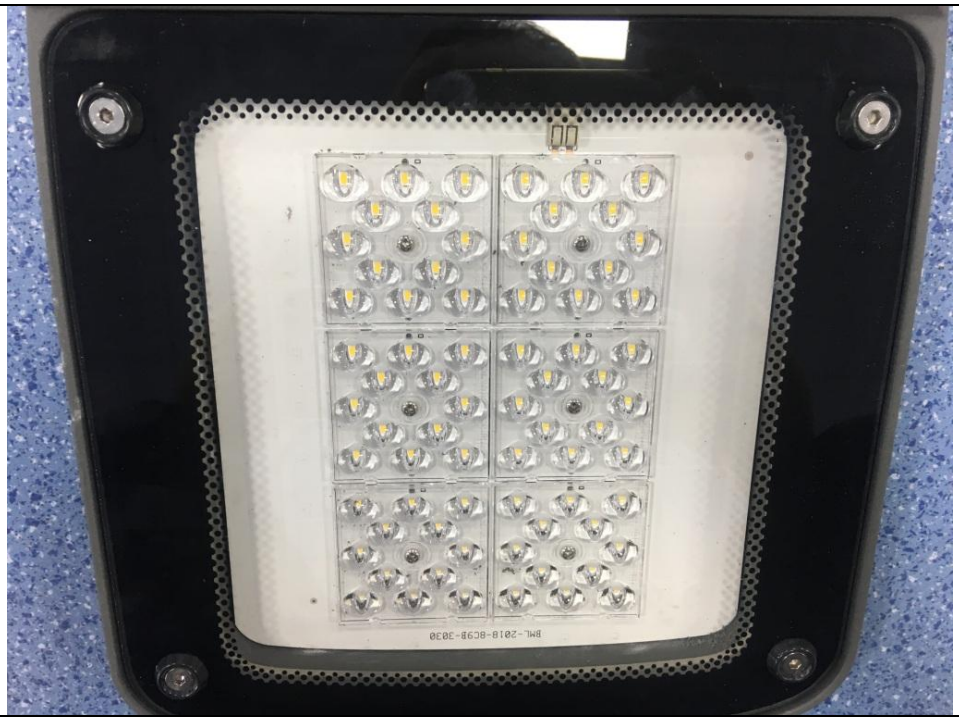


Details of: Overview for model BML-2018C 60W
Remark:

Attachment No. 4

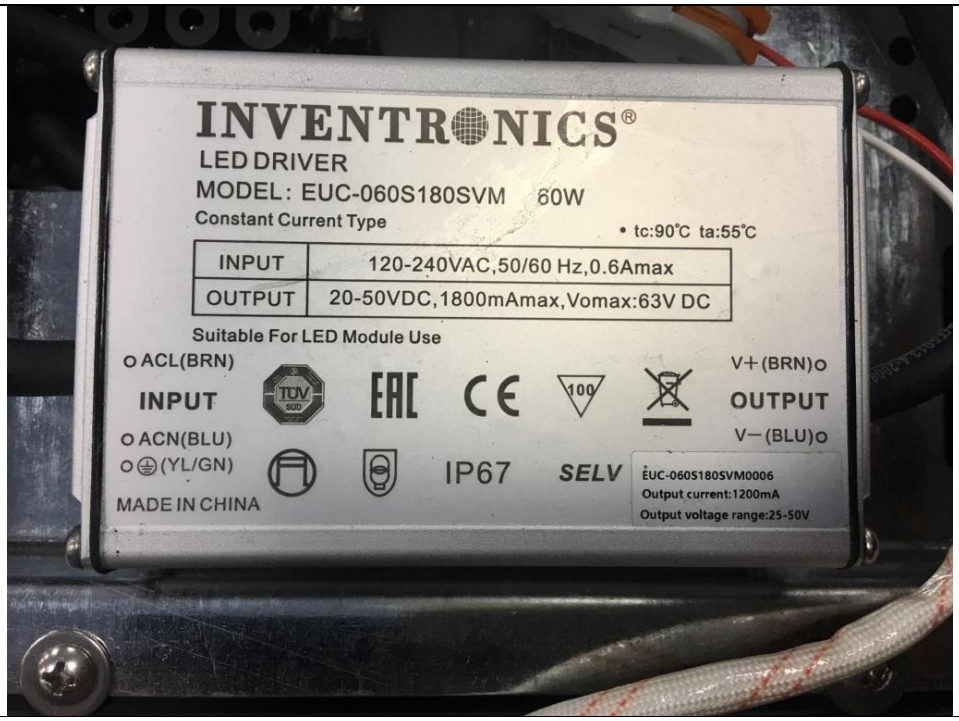
Details of: Back view for model BML-2018C 60W
Remark:

Details of: LED module overview for model BML-2018C 60W
Remark:



Attachment No. 4

Details of: LED driver overview for model BML-2018C 60W
Remark:



Details of: Overview for model BML-2018C 40W
Remark:

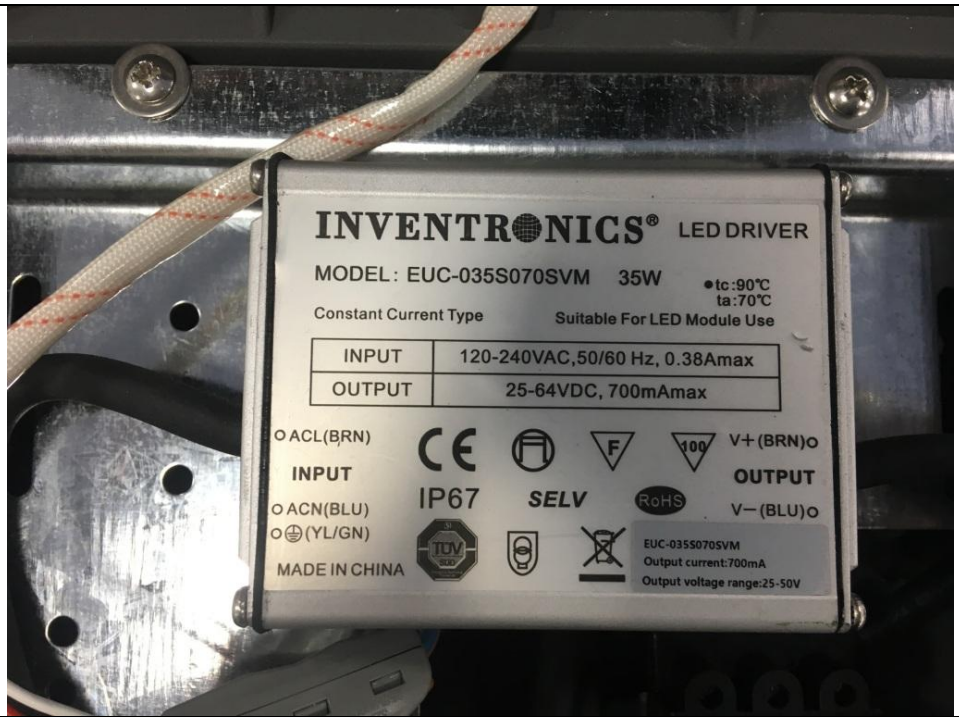
Attachment No. 4

Details of: Back view for model BML-2018C 40W
Remark:

Details of: LED module overview for model BML-2018C 40W
Remark:

Attachment No. 4

Details of: LED driver overview for model BML-2018C 40W
Remark:



End of the photo documentation

Technical Report No.: 64.140.23.50317.01

Date: 2023-10-09

Client:	Name: DANYANG BRIGHT-MOON LIGHTING CO., LTD. Address: South Of Huguo Road, Erling Town, 212300 Danyang City, Jiangsu Province, PEOPLE'S REPUBLIC OF CHINA Contact person: Candice Zhu
Manufacturer:	Name: Same as client Address: Same as client
Factory:	Name: Same as client Address: Same as client
Test object:	Product: LED STREET LIGHT Model: BML-2018B 80W Trade Mark: 明月照明 BRIGHT-MOON LIGHTING [BRIGHT MOON LIGHTING]
Test specification:	Clause 2 of PD ENEC 303 Annex A – January 2022
Purpose of examination:	• Product Verification test according to the above test specification
Test result:	The test results show that the presented product is in compliance with the above listed test specifications.

Any use for advertising purposes must be granted in writing. This technical report may only be quoted in full. This report is the result of a single examination of the object in question. It does not imply a general statement regarding the quality of products from regular production. For further details please see testing and certification regulation, chapter A-3.4.

www.tuvsud.com

TÜV®

TÜV SÜD Certification and Testing (China) Co., Ltd.
Guangzhou Branch
5F&8F East, Communication Building, No.163 Pingyun Road, Huangpu Ave. West, Guangzhou 510656 China

Telephone : +86 20 38320668
Telefax : +86 20 38320478

1. Description of the test object

1.1 Picture(s)

See Appendix 1.

1.2 Function

Manufacturer's specification for intended use:
LED STREET LIGHT for outdoor use only.

1.3 Consideration of the foreseeable use

☐ Not applicable
☒ Covered through the applied standard
☐ Covered by the following comment*
☐ Covered by attached risk analysis
*

1.4 Technical Data

Luminaires for road and street lighting
(LED STREET LIGHT)

Rated Voltage	:	120-240VAC
Rated Frequency	:	50/60Hz
Rated Power	:	80W
Protection Class	:	I
Degree of Protection	:	IP66
Blue Light Risk Group	:	RG1
ta:	:	40°C

2. Order

2.1 Date of Purchase Order, Customer's Reference

2023-09-11

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TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F&8F East, Communication Building, No.163 Pingyun Road, Huangpu Ave. West, Guangzhou 510656 China

Telephone : +86 20 38320668
Telefax : +86 20 38320478

2.2 Test Sample(s)

- Reception date(s): 2023-09-11
- Location(s) of reception: TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
  5F&8F East, Communication Building, No.163 Pingyun Road, Huangpu Ave. West, Guangzhou 510656 China
- Condition of test sample(s): Good

2.3 Testing

- Testing date(s): 2023-09-11 to 2023-10-09
- Location(s) of testing: TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
  5F&8F East, Communication Building, No.163 Pingyun Road, Huangpu Ave. West, Guangzhou 510656 China

2.4 Points of Non-Compliance or Exceptions of the Test Procedure

- None

3. Test Results

PRODUCT VERIFICATION TESTS (PVT)

EN 60598-2-3:2003+A1:2011; EN 60598-1:2015+A1:2018			
Clause	Requirement + Test	Result - Remark	Verdict
2.1 Endurance test (clause 12.3 of EN 60598-1)			**P**
3.12 (12)	**ENDURANCE TEST AND THERMAL TEST**		—
3.12.2 (-)	**If IP > IP 20 relevant test of (12.4), (12.5), (12.6) and (12.7) after (9.2) before (9.3) as specified in 3.13**		—
3.12 (12.3)	**Endurance test:**		P
	a) mounting-position ..... :	As normal used	—
	b) test temperature (°C) ..... :	50	—
	c) total duration (h) ..... :	240	—

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	d) supply voltage (V)..... :	264	—
	d) if not equipped with controlgear, constant voltage/current (V) or (A) ..... :		—
	e) luminaire ceases to operate		—
3.12 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N/A
	- marking legible		P
	- no cracks, deformation etc.		P

2.2 Protection of the enclosure (clause 9 of EN 60598-1)			P
3.13.1 (-)	If IP > IP 20 the order of tests as specified in clause 3.12		P
3.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP ..... :	IP66	—
	- mounting position during test..... :	As normal use	—
	- fixing screws tightened; torque (Nm) ..... :	--	—
	- tests according to clauses ..... :	Clause 9.2.2 and 9.2.7	—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N/A
	b) no talcum in dust-tight luminaire		P
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		P
	c.1) For luminaires without drain holes – no water entry		P
	c.2) For luminaires with drain holes – no hazardous water entry		N/A
	d) no water in watertight or pressure watertight luminaire		N/A
	e) no contact with live parts (IP 2X)		N/A
	e) no entry into enclosure (IP 3X and IP 4X)		N/A
	e) no contact with live parts through drain holes and ventilation slots (IP3X and IP4X)		N/A

	f) no trace of water on part of lamp requiring protection from splashing water		N/A
	g) no damage of protective shield or glass envelope		N/A

2.3 Mechanical strength of screws and nuts (clause 14 of EN 60598-1)			N/A
(14)	**SCREW TERMINALS**		—
(14.2)	Type of terminal ..... :		—
	Rated current (A) ..... :		—
(14.3.2.1)	One or more conductors		N/A
(14.3.2.2)	Special preparation		N/A
(14.3.2.3)	Terminal size		N/A
	Cross-sectional area (mm²) ..... :		N/A
(14.3.3)	Conductor space (mm) ..... :		N/A
(14.4)	Mechanical tests		N/A
(14.4.1)	Minimum distance		N/A
(14.4.2)	Cannot slip out		N/A
(14.4.3)	Special preparation		N/A
(14.4.4)	Nominal diameter of thread (metric ISO thread) . :	M	N/A
	External wiring		N/A
	No soft metal		N/A
(14.4.5)	Corrosion		N/A
(14.4.6)	Nominal diameter of thread (mm) ..... :		N/A
	Torque (Nm) ..... :		N/A
(14.4.7)	Between metal surfaces		N/A
	Lug terminal		N/A
	Mantle terminal		N/A
	Pull test; pull (N) ..... :		N/A
(14.4.8)	Without undue damage		N/A

2.4 Protection against electric shock (clause 8) and creepage distances and clearances (clause 11 of EN 60598-1)	**P**

3.11 (8)	**PROTECTION AGAINST ELECTRIC SHOCK**		—
3.11 (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 and adjustable luminaires		P
	Basic insulated parts not accessible with Ø 50 mm probe from outside, within arms reach, on wall-mounted luminaires		N/A
	Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements		N/A
	Basic insulation only accessible under lamp or starter replacement		N/A
	Protection in any position		P
	Double-ended tungsten filament lamp		N/A
	Insulation lacquer not reliable		N/A
	Double-ended high pressure discharge lamp		N/A
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
3.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
3.11 (8.2.3.a)	Class II luminaire:		N/A
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A
	- basic insulation not accessible other than during starter or lamp replacement		N/A
	- glass protective shields not used as supplementary insulation		N/A
3.11 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N/A
3.11 (8.2.3.c)	SELV circuits with exposed current carrying parts:		N/A
	Ordinary luminaire:		N/A

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	- voltage under load (V) ..... :		N/A
	- no-load voltage (V) ..... :		N/A
	- touch current if applicable (mA) ..... :		N/A
	One conductive part insulated if required		N/A
	Other than ordinary luminaire:		N/A
	- nominal voltage (V) ..... :		N/A
	Class III luminaire only for connection to SELV		N/A
	Class III luminaire not provided with means for protective earthing		N/A
3.11 (8.2.4)	Portable luminaire have protection independent of supporting surface		N/A
3.11 (8.2.5)	Compliance with the standard test finger or relevant probe		P
3.11 (8.2.6)	Covers reliably secured		P
3.11 (8.2.7)	Luminaire other than below with capacitor > 0,5 μF not exceed 50 V 1 min after disconnection		P
	Portable luminaire with capacitor > 0,1 μF (0.25) not exceed 34 V 1 s after disconnection		N/A
	Other luminaires with capacitor > 0.1 μF (0.25) with plug and track adaptors not exceed 60 V 5 s after disconnection		N/A

1.7 (11.2)	**TABLE: Creepage distances and clearances**						**P**
	Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages						**P**
	Applicable part of IEC 60598-1 Table 11.1* and 11.2*						**P**
	Insulation type **	**Measured clearance**	**Required**		**Measured creepage**	**Required**	
			clearance	***Table**		**creepage**	***Table**
Distance 1:	B	>10	1.5	11.1B	>10	2.5	11.1A
Distance 2:	B	>10	1.5	11.1B	>10	2.5	11.1A
Distance 3:	B	1,8	0.5	11.1B	1,8	1.6	11.1A
Working voltage (V) ..... :					240V for Distance 1, 2, 89V for Distance 3		—
PTI..... :					< 600 ☒ ≥ 600 ☐		—

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Pulse voltage if applicable (kV) .....:	--	—
Supplementary information: Min. values were recorded. Distance 1: Live part in terminal block to earthed metal enclosure; Distance 2: Live part in quick connector to earthed metal enclosure; Distance 3: Live part in LED module to earthed metal enclosure.		

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

2.5 Stability of portable luminaires (EN 60598-2-4 clause 4.6.3)	N/A
2.6 PHOTOTBIOLOGICAL Hazard (EN 62471, IEC/TR 62471-2 and IEC/TR 62778)	**P**
2.6.1 Blue light hazard (see annex 2 for details) Only required for luminaires containing LED, metal halide and some specialist tungsten halogen lamp type.	**P**
2.6.2 UV hazard Periodic reassessment for UV hazard is not considered necessary as this is controlled by the safety requirements for the light source or by the use of any glass filter fitted to the luminaire.	**N/A**

Annex 1	**TABLE: Spectroradiometric measurement**		**P**
	Measurement performed on:	☐ **LED package** ☐ **LED module** ☐ **Lamp** ☒ **Luminaires**	
	Model number.....:	BML-2018B 80W	
	Test voltage (V).....:	240VAC	—
	Test current (mA) .....:	--	—
	Test frequency (Hz).....:	50Hz	—
	Ambient, t (°C).....:	25.0°C	—
	Measurement distance .....:	☒ 20 cm ☐ ... cm	—
	Source size .....:	☒ Non-small ☐ Small: .... mm	—
	Field of view .....:	☐ 100 mrad ☒ 11 mrad ☐ 1.7 mrad (for small sources)	—

Item	Symbol	Units	Result	Remark
Correlated colour temperature	CCT	K	--	--
x/y colour coordinates	--	--	--	--
Blue light hazard radiance	L_B	$W/(m^2 \cdot sr^1)$	3.88E+03	RG1
Blue light hazard irradiance	E_B	W/m^2	--	--
Luminance	L	cd/m^2	2.13E+06	--
Illuminance	E	lx	--	--
Supplementary information: --				

4. Test History

- None

5. Remarks

5.1 Product verification test for BML-2018B 80W model based on the certificates U6 104423 0001 Rev. 00

5.2 Appendix 1: photo document.

6. Documentation

- None

7. Summary

"The test specification are met"

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TÜV SÜD Group

Tested by:

Peter Hu, Project Handler

Approved by:

Kenny Chen, Designated Reviewer

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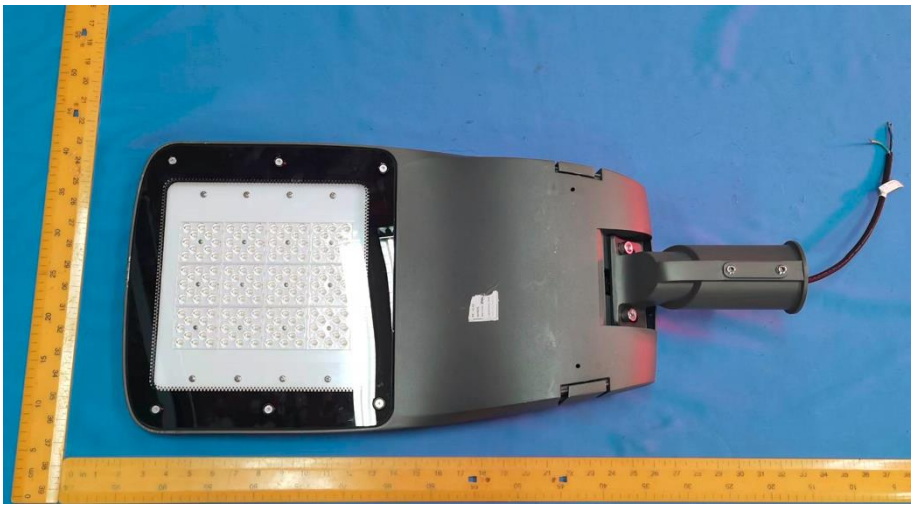
Appendix 1: Photo document

Details of: Outlook view



Details of: Outlook view

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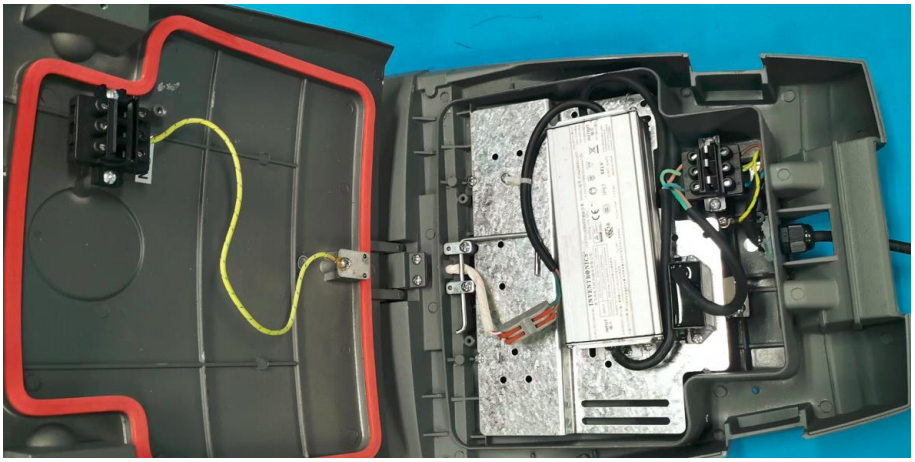
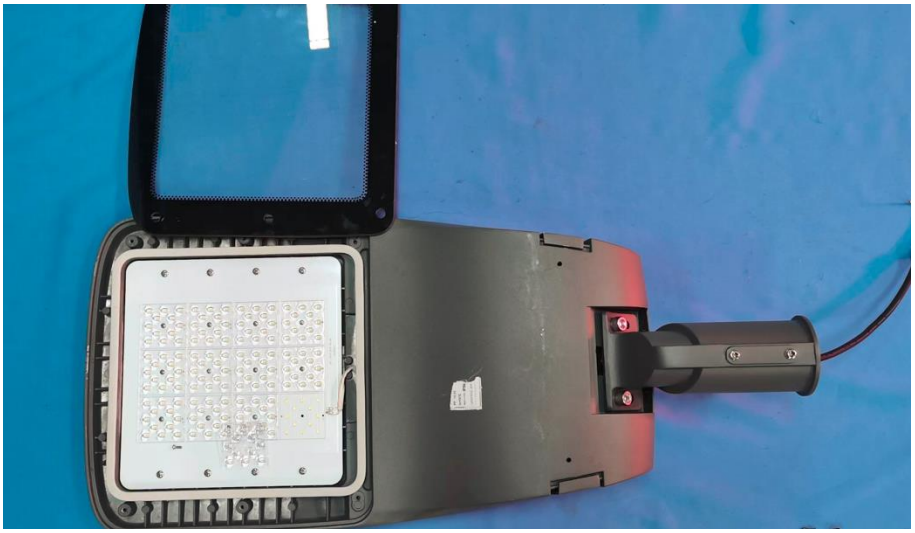
Details of: Internal view



Details of: Internal view



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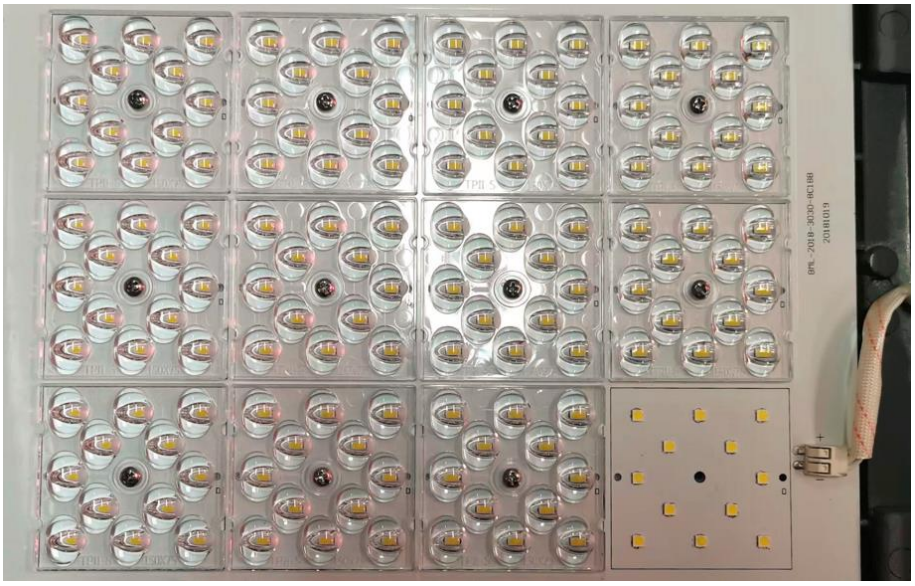
Details of: LED module view



Details of: LED driver view

--- End of Report ---

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Technical Report No.: 64.140.23.50318.01

Date: 2023-10-09

Client:	Name: DANYANG BRIGHT-MOON LIGHTING CO., LTD. Address: South Of Huguo Road, Erling Town, 212300 Danyang City, Jiangsu Province, PEOPLE'S REPUBLIC OF CHINA Contact person: Candice Zhu
Manufacturer:	Name: Same as client Address: Same as client
Factory:	Name: Same as client Address: Same as client
Test object:	Product: LED STREET LIGHT Model: BML-2018B 80W Trade Mark: 明月照明 BRIGHT-MOON LIGHTING [BRIGHT MOON LIGHTING]
Test specification:	Clause 1 of OD ENEC 324 Annex A – April 2023
Purpose of examination:	• Product Surveillance test according to the above test specification
Test result:	The test results show that the presented product is in compliance with the above listed test specifications.

Any use for advertising purposes must be granted in writing. This technical report may only be quoted in full. This report is the result of a single examination of the object in question. It does not imply a general statement regarding the quality of products from regular production. For further details please see testing and certification regulation, chapter A-3.4.

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1. Description of the test object

1.1 Picture(s)

See Appendix 1.

1.2 Function

Manufacturer's specification for intended use:
LED STREET LIGHT for outdoor use only.

1.3 Consideration of the foreseeable use

☐ Not applicable
☒ Covered through the applied standard
☐ Covered by the following comment*
☐ Covered by attached risk analysis
*

1.4 Technical Data

Luminaires for road and street lighting
(LED STREET LIGHT)

Rated Voltage	:	120-240VAC
Rated Frequency	:	50/60Hz
Rated Power	:	80W
Protection Class	:	I
Degree of Protection	:	IP66
Blue Light Risk Group	:	RG1
ta:	:	40°C

2. Order

2.1 Date of Purchase Order, Customer's Reference

2023-09-11

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2.2 Test Sample(s)

- Reception date(s): 2023-09-11
- Location(s) of reception: TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
  5F&8F East, Communication Building, No.163 Pingyun Road, Huangpu Ave. West, Guangzhou 510656 China
- Condition of test sample(s): Good

2.3 Testing

- Testing date(s): 2023-09-11 to 2023-10-09
- Location(s) of testing: TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
  5F&8F East, Communication Building, No.163 Pingyun Road, Huangpu Ave. West, Guangzhou 510656 China

2.4 Points of Non-Compliance or Exceptions of the Test Procedure

- None

3. Test Results

PRODUCT OD ENEC 324

EN 60598-2-3:2003+A1:2011; EN 60598-1:2015+A1:2018			
Clause	Requirement + Test	Result - Remark	Verdict
3.8 (7.2.1 + 7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		P
	Resistance < 0,5 Ω.....:	Max.0.022 Ω	P
	Self-tapping screws used		N/A
	Thread-forming screws		N/A
	Thread-forming screw used in a grove		N/A
	Earth makes contact first		N/A

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	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
	Protective earthing of the luminaire not via built-in control gear		P
3.8 (7.2.2 + 7.2.3)	Earth continuity in joints, etc.		P
3.8 (7.2.4)	Locking of clamping means		P
	Compliance with 4.7.3		P
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
3.8 (7.2.5)	Earth terminal integral part of connector socket		N/A
3.8 (7.2.6)	Earth terminal adjacent to mains terminals		P
3.8 (7.2.7)	Electrolytic corrosion of the earth terminal		P
3.8 (7.2.8)	Material of earth terminal		P
	Contact surface bare metal		P
3.8 (7.2.10)	Class II luminaire for looping-in		N/A
	Double or reinforced insulation to functional earth		N/A
3.8 (7.2.11)	Earthing core coloured green-yellow		P
	Length of earth conductor		P
3.8.1(-)	Attachment prevented from rotation		N/A

1.13 (9)	**RESISTANCE TO DUST AND MOISTURE**		—
3.13.1 (-)	If IP > IP 20 the order of tests as specified in clause 1.12		N/A
3.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP ..... :	IP66	—
	- mounting position during test..... :	As normal use	—
	- fixing screws tightened; torque (Nm) ..... :	--	—
	- tests according to clauses ..... :	Clause 9.2.2 and 9.2.7	—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N/A
	b) no talcum in dust-tight luminaire		P

	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		P
	c.1) For luminaires without drain holes – no water entry		P
	c.2) For luminaires with drain holes – no hazardous water entry		N/A
	d) no water in watertight or pressure watertight luminaire		N/A
	e) no contact with live parts (IP 2X)		N/A
	e) no entry into enclosure (IP 3X and IP 4X)		N/A
	e) no contact with live parts through drain holes and ventilation slots (IP3X and IP4X)		N/A
	f) no trace of water on part of lamp requiring protection from splashing water		N/A
	g) no damage of protective shield or glass envelope		N/A
3.13 (9.3)	Humidity test 48 h	25°C; 93%RH; 48 h	P

3.14 (10)	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		—
3.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø ..... :		—
	Insulation resistance (MΩ) ..... :		—
	SELV		P
	- between current-carrying parts of different polarity ..... :		N/A
	- between current-carrying parts and mounting surface ..... :	100MΩ (required: 1MΩ)	P
	- between current-carrying parts and metal parts of the luminaire ..... :	100MΩ (required: 1MΩ)	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts ..... :		N/A
	- Insulation bushings as described in Section 5 . :		N/A
	Other than SELV		P

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	- between live parts of different polarity ..... :		N/A
	- between live parts and mounting surface ..... :	100MΩ (required: 2MΩ)	P
	- between live parts and metal parts ..... :	100MΩ (required: 2MΩ)	P
	- between live parts of different polarity through action of a switch ..... :		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts ..... :		N/A
	- Insulation bushings as described in Section 5 . :		N/A
3.14 (10.2.2)	Electric strength test		P
	Dummy lamp		N/A
	Luminaires with ignitors after 24 h test		N/A
	Luminaires with manual ignitors		N/A
	Test voltage (V)..... :		N/A
	SELV		N/A
	- between current-carrying parts of different polarity ..... :		N/A
	- between current-carrying parts and mounting surface ..... :	500V	P
	- between current-carrying parts and metal parts of the luminaire ..... :	500V	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts ..... :		N/A
	- Insulation bushings as described in Section 5 . :		N/A
	Other than SELV		P
	- between live parts of different polarity ..... :		N/A
	- between live parts and mounting surface ..... :	1480V	P
	- between live parts and metal parts ..... :	1480V	P
	- between live parts of different polarity through action of a switch ..... :		N/A

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	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts ..... :		N/A
	- Insulation bushings as described in Section 5 . :		N/A

4. Test History

- None

5. Remarks

5.1 Product Surveillance test for BML-2018B 80W model based on the certificates U6 104423 0001 Rev. 00

5.2 Appendix 1: photo document.

6. Documentation

- None

7. Summary

"The test specification are met"

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
TÜV SÜD Group

Tested by:

Peter Hu, Project Handler

Approved by:

Kenny Chen, Designated Reviewer

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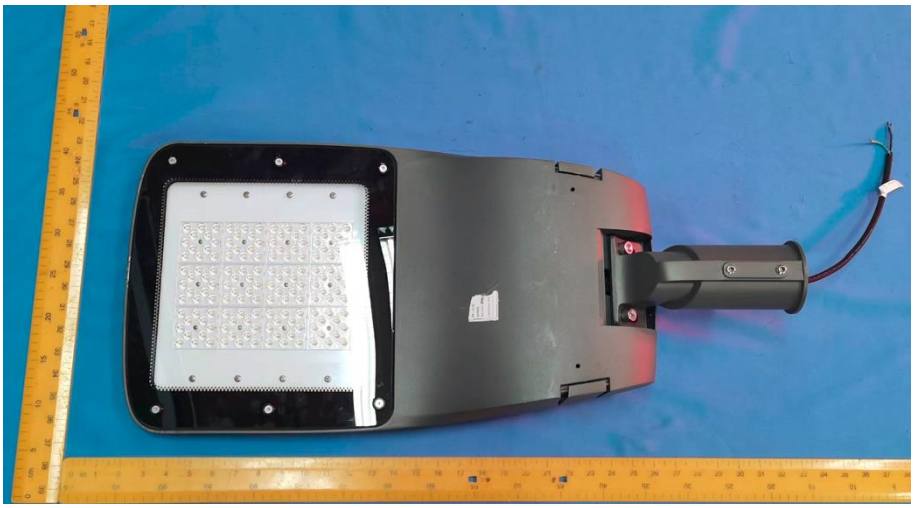
Appendix 1: Photo document

Details of: Outlook view



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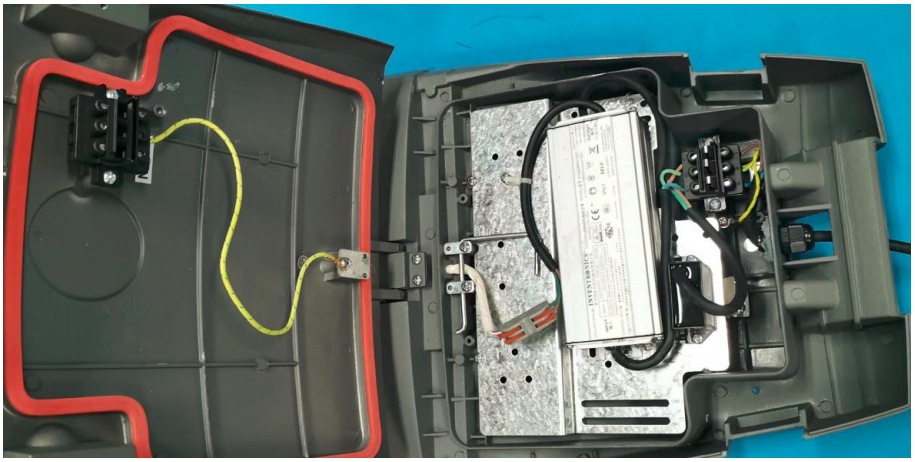
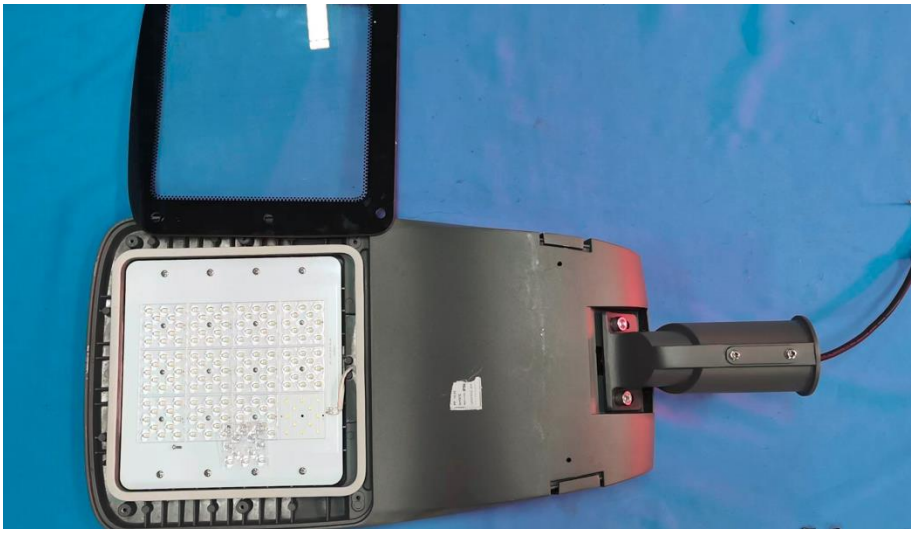
Details of: Internal view



Details of: Internal view

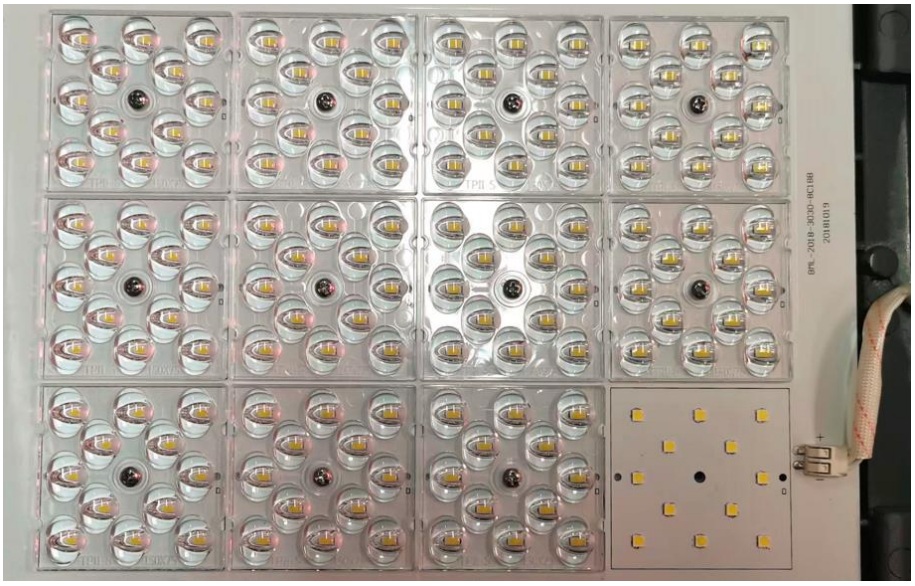


www.tuvsud.com

TÜV SÜD Certification and Testing (China) Co., Ltd.
Guangzhou Branch
5F&8F East, Communication Building, No.163 Pingyun Road, Huangpu Ave. West, Guangzhou 510656 China

Telephone : +86 20 38320668
Telefax : +86 20 38320478

Details of: LED module view



Details of: LED driver view

--- End of Report ---

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TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F&8F East, Communication Building, No.163 Pingyun Road, Huangpu Ave. West, Guangzhou 510656 China

Telephone : +86 20 38320668
Telefax : +86 20 38320478

Product Service

CERTIFICATE

No. U6 104423 0001 Rev. 00

Holder of Certificate: **DANYANG BRIGHT-MOON LIGHTING CO., LTD.**
South Of Huguo Road, Erling Town
212300 Danyang City, Jiangsu Province
PEOPLE'S REPUBLIC OF CHINA

Certification Mark:

Product: **Luminaires for road and street lighting (LED STREET LIGHT)**

The product was voluntarily tested according to the listed standards. The product can be marked with the certification mark shown above. The certification mark must not be altered in any way. See also notes overleaf.

Test report no.: 64142195002801

Date, 2019-09-20

(Taylor Yao)

TÜV SÜD Product Service GmbH • Certification Body • Ridlerstraße 65 • 80339 Munich • Germany

Product Service

CERTIFICATE

No. U6 104423 0001 Rev. 00

Model(s): **BML-2018A 300W; BML-2018A 240W; BML-2018A 200W; BML-2018B 150W; BML-2018B 120W; BML-2018B 100W; BML-2018B 80W; BML-2018C 60W; BML-2018C 50W; BML-2018C 40W; BML-2018C 30W**

Brand Name: **BRIGHT MOON LIGHTING**

BRIGHT-MOON LIGHTING 明月照明 BRIGHT－MOON LIGHTING

Parameters:

Rated Voltage: 120-240VAC
Rated Frequency: 50/60Hz
Rated Power: 300W [BML-2018A 300W]; 240W [BML-2018A 240W];
200W [BML-2018A 200W]; 150W [BML-2018B 150W];
120W [BML-2018B 120W]; 100W [BML-2018B 100W];
80W [BML-2018B 80W]; 60W [BML-2018C 60W];
50W [BML-2018C 50W]; 40W [BML-2018C 40W];
30W [BML-2018C 30W]
Protection Class: I
Degree of Protection: IP66
ta: 40°C
Blue Light Risk Group: RG01

Tested according to: EN 60598-2-3:2003/A1:2011
EN 60598-1:2015/A1:2018

Production Facility(ies): 104423

TÜV SÜD Product Service GmbH • Certification Body • Ridlerstraße 65 • 80339 Munich • Germany

TÜV®

TEST REPORT

No. ETA23070015P-001 for

DANYANG BRIGHT-MOON LIGHTING CO.,LTD

NO. 8 HUGUO ROAD, ERLING TOWN, DANYANG CITY, JIANGSU PROVINCE

Service	IESNA LM-82 TEST REPORT
Model Number	BML-2018B-150W
Trade Mark	BM-LIGHTING
Date of Issue	August 2, 2023
Date of Tests	August 1, 2023 through August 2, 2023
Test Laboratory	Hangzhou ETA Testing Technology Co., Ltd.
Address	Floor 8, Building A, The Western Science Park, Yuhang District, Hangzhou 311121, China
Test Location	Hangzhou ETA Testing Technology Co., Ltd.
Prepared By	Kavi Ding
Reviewer	Sean Wan

Table of Content

********** End of Page **********

REMARKS

General Disclaimer	The test results presented in this report relate only to the object tested.
TBD	To Be Determined, test case will be conducted.
N/A	Test case does not apply to the test object.

REFERENCE STANDARD

Designation	**Description**
IES LM-82-12	Method for the Characterization of LED Light Engines and Integrated LED Lamps for Electrical and Photometric Properties as a Function of Temperature
IES LM-79-08	Electrical and Photometric Measurements of Solid-State Lighting Products (Goniophotometer)
ANSI/UL 1598:2008	Standard for Safety of Luminaire
ANSI/UL 1598C	Light-Emitting Diode (LED) Retrofit Luminaire Conversion Kits
ANSI/UL 1993:2011	Self-Ballasted Lamps and Lamp Adapters
ANSI/UL 8750:2009	Standard for Light Emitting Diode (LED) Equipment for Use in Lighting Products

The above standards or test methods were used in part or totally to test.

TEST METHOD

Temperature Monitoring Point Measurement

The temperature monitoring point shall be identified by the requester or the UUT manufacturer. The requester shall identify and diagram a UUT temperature monitoring point, *T*b, and a driver temperature monitoring point *T*d , Testo 176T4 temperature Meter is used to measure the temperature, and they were calibrated with an expanded uncertainty (k = 2) of less than 1° C. Thermal Couple mechanically attached to the TMP throughout the duration of the tests. The *T*b of the UUT operating at the electrical conditions specified for the test was set to the specified temperature within a tolerance of ±1° C.

Seasoning

The UUT does not be seasoned before measurement.

Room Temperature Initial Measurement

Total light output (luminous flux) for 25° C ambient temperature conditions is measured using a 2.0m 4∏ geometry integrating sphere. Temperature is measured at a position inside the sphere by Fluke 52II.

********** End of Page **********

Spectral radiant flux measurements are made using EVERFINE HASS-2000 to the detector port of the integrating sphere. Each lamp is operated at rated voltage in its designated orientation. Each lamp should be stable before measurements are made. The determining method of stable is as follows:

Step 1 Take 3 measurements of the lamp light output at 15 minute interval (total time=30mintues.)This time period is in addition to the recommended pre-burning time.

Step 2 Calculate the percent difference between the maximum measured value and the minimum measured value for the three consecutive measurements.

Step 3 if the value calculated in Step 2 does not exceed 0.5 percent, the lamp is considered stable.

Luminous flux, chromaticity coordinates, correlated color temperature and color rendering index for each lamp are calculated from the spectral radiant flux measurements taken at 2 nm intervals over the range 380 to 780nm. The calibration of the sphere photometer-spectrometer system is traceable to the NIM China. Lamp efficacy (lumens per watts) for each lamp model is computed based on the revised luminous flux result. Electrical measurements including voltage, current, power and power factor are measured using the YOKOGAWA WT310 digital power Meter.

Record electrical power *P*i (W), total luminous flux Φi(lm), and optionally, chromaticity coordinates (xi, yi), (*u'i*,*v'i*), and correlated color temperature *CCT*i (K).Record the UUT manufacturer-specified temperature monitoring point temperature(s), *T*b as *T*b,i, and the manufacturer-specified temperature monitoring point(s) for the driver, *T*d as *T*d,i

Room Temperature Calibration Measurement

Control the air temperature which around the UUT, until the Tb is same as the temperature value of Initial test and be stable, the lighting output was measured using a 2.0m 4∏ geometry integrating sphere. Temperature is measured at the TMP location by Testo 176T4. Spectral radiant flux measurements are made using EVERFINE HASS-2000 to the detector port of the integrating sphere. Each lamp is operated at rated voltage in its designated orientation. Each lamp should be stable before measurements are made. The determining method of stable is as follows:

Step 1 Take 3 measurements of the lamp light output at 15 minute interval (total time=30mintues.)This time period is in addition to the recommended pre-burning time.

Step 2 Calculate the percent difference between the maximum measured value and the minimum measured value for the three consecutive measurements.

Step 3 if the value calculated in Step 2 does not exceed 0.5 percent, the lamp is considered stable.

Luminous flux, chromaticity coordinates, correlated color temperature and color rendering index for each lamp are calculated from the spectral radiant flux measurements taken at 2 nm intervals over the range 380 to 780 nm. The calibration of the sphere photometer-spectrometer system is traceable to the NIST USA. Lamp efficacy (lumens per watts) for each lamp model is computed based on the revised luminous flux result. Electrical measurements including voltage, current, power and power factor are measured using the YOKOGAWA WT310 digital power Meter.

Record the value of *T*b as *T*b,0. While keeping *T*b constant, measure the electrical power *P*0, total luminous flux 0 or luminous intensity *I*0 at the defined spatial point, and optionally, chromaticity coordinates (*x*0,*y*0), (*u'*0,*v'*0), and correlated color temperature *CCT*0 if recorded during the initial

********** End of Page **********

measurement.

The correction factors between the room temperature initial measurements and room temperature

Electric power correction factor:

$$C_{power} = \frac{P_i}{P_0} \quad (1)$$

Luminous flux correction factor:

$$C_{flux} = \frac{\Phi_i}{\Phi_0} \quad (2a)$$

or

$$C_{flux} = \frac{\Phi_i}{I_0} . \quad (2b)$$

Chromaticity corrections:

$$\Delta_x = x_i - x_0 , \Delta_y = y_i - y_0 \quad (3a)$$

or

$$\Delta_{u'} = u'_i - u'_0 , \Delta_{v'} = v'_i - v'_0 \quad (3b)$$

$$\Delta_{CCT} = CCT_i - CCT_0 . \quad (4)$$

Measurement at Temperature Tb, 0 + 25°C

Control the air temperature which around the UUT, until the Tb is Tb,0+25℃ and be stable, the lighting output was measured using a 2.0m 4∏ geometry integrating sphere. Temperature is measured at the TMP location by Testo 176T4. Spectral radiant flux measurements are made using EVERFINE HASS-2000 to the detector port of the integrating sphere. Each lamp is operated at rated voltage in its designated orientation. Each lamp should be stable before measurements are made. The determining method of stable is as follows:

Step 1 Take 3 measurements of the lamp light output at 15 minute interval (total time=30mintues.)This time period is in addition to the recommended pre-burning time.

Step 2 Calculate the percent difference between the maximum measured value and the minimum measured value for the three consecutive measurements.

Step 3 if the value calculated in Step 2 does not exceed 0.5 percent, the lamp is considered stable.

Luminous flux, chromaticity coordinates, correlated color temperature and color rendering index for each lamp are calculated from the spectral radiant flux measurements taken at 2 nm intervals over the range 380 to 780 nm. The calibration of the sphere photometer-spectrometer system is traceable to the NIST USA. Lamp efficacy (lumens per watts) for each lamp model is computed based on the revised luminous flux result. Electrical measurements including voltage, current, power and power factor are measured using the YOKOGAWA WT310 digital power Meter.

********** End of Page **********

Measure the electrical power *P*1, photometric and colorimetric properties, total luminous flux 1 or luminous intensity 1, and as optional, chromaticity coordinates (*x*1,*y*1), or (*u'*1,*v'*1), and correlated color temperature *CCT*1.

Record the corrected results for the first elevated temperature $T_b = T_{b,1}$ as:

$$P = C_{power} P_1 \quad (5)$$

$$\Phi = C_{flux} \Phi_1 \quad (6a)$$

or

$$\Phi = C_{flux} I_1 . \quad (6b)$$

And as optional,

$$x = x_1 + \Delta_x , \; y = y_1 + \Delta_y \quad (7a)$$

or

$$u' = u'_1 + \Delta_{u'} , \; v' = v'_1 + \Delta_{v'} \quad (7b)$$

$$CCT = CCT_1 + \Delta_{CCT} . \quad (8)$$

********** End of Page **********

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Calibration data	Due date
Two meter integrating sphere unit	Everfine – 2M	ETA1014	---	---
AC power source for Integrating Sphere System	DPS1010	ETA1002	2022/12/6	2023/12/6
Power Analyzer for Integrating Sphere System	WT310	ETA1001	2022/12/6	2023/12/6
Spectroradiometer	HAAS 2000	ETA1003	---	---
DC Linear Power Source	WY12010	ETA1004	2022/12/6	2023/12/6
Illumination Photometer	Z-10	ETA1007	2022/12/6	2023/12/6
Luminous intensity Standard lamp For Goniophotometer	---	ETA1008	2023/3/21	2024/3/21
Standard lamp	D204	ETA1009	2023/3/21	2024/3/21
Aging room 1	HWX-35F	ETA1054	---	---
Aging room 2	HWX-35F	ETA1056	---	---
Digital Thermometer	TES-1311A	ETA1141	2022/12/6	2023/12/6

********** End of Page **********

PRODUCT INFORMATION

Manufacturer	DANYANG BRIGHT-MOON LIGHTING CO.,LTD
Address	NO. 8 HUGUO ROAD, ERLING TOWN, DANYANG CITY, JIANGSU PROVINCE
Trade Mark	BM-LIGHTING
Sample Quantity	1 pcs
Sample Number	1230801-05-001
Product Name	LED Street Lighting
Model Number	BML-2018B-150W
Nominal Operate Voltage (V; Hz)	90-305V~, 50Hz
Nominal Power	150W
Nominal CCT	4000K
Nominal CRI(Ra)	≥70
Nominal Life	N/A
LED Lighting Source Manufacture	Lumileds
LED Lighting Source Model	Luxeon 5050
Driver Brand	N/A
Driver Model Number	N/A
Driver output Voltage and Current	N/A
Maximum Recommended Temperature (ºC) During Normal Operation	N/A
Orientation (burning position) of SSL product during test	Lighting Surface Face Down

********** End of Page **********

TEST RESULT

UUT Name: LED Street Lighting	UUT M/N: BML-2018B-150W	UUT S/N: N/A
Internal Procedure Reference: ETA-TR-020_LM-82		

	Initial Temperature	First Elevated Temperature (Initial+25℃)	Second Elevated Temperature (66.5℃)
Measured Temperature of Tb (℃)	51.7	76.7	66.5
Input Voltage (V)	240.0	240.0	240.0
Input Current (A)	0.639	0.636	0.637
Input Power (W)	151.48	151.17	151.30
Power Factor	0.99	0.99	0.99
Luminous Flux (lm)	22698	22617	22652
Luminous Efficacy (lm/W)	149.84	149.61	149.72
CCT (K) (as optional)	3957	3976	3967
CRI (Ra) (as optional)	72.2	72.4	72.3
CIE chromaticity (*x*) (as optional)	0.3844	0.3834	0.3839
CIE chromaticity (*y*) (as optional)	0.3852	0.3843	0.3847
CIE chromaticity (*u'*) (as optional)	0.2243	0.2241	0.2242
CIE chromaticity (*v'*) (as optional)	0.5058	0.5053	0.5056

********** End of Page **********

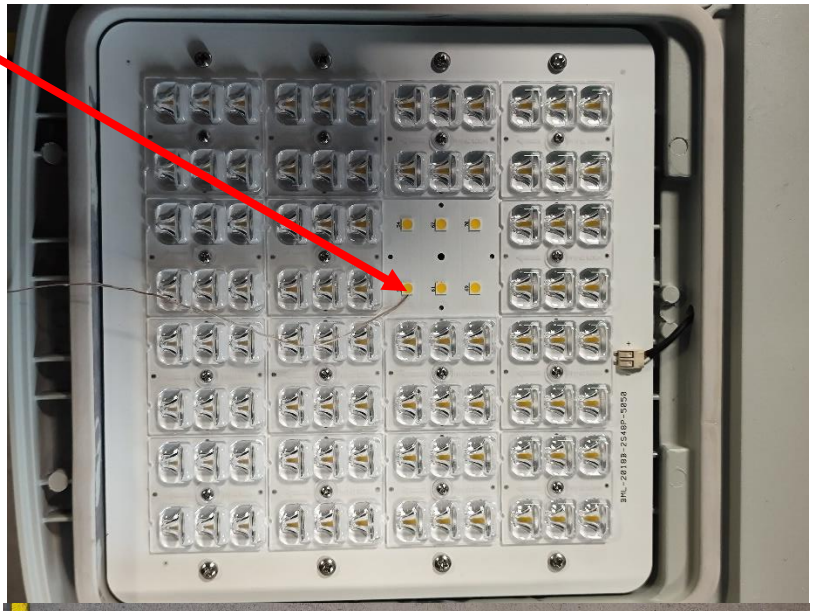
Duv (as optional)	0.0028	0.0026	0.0027
Uncertainties	/	/	/

Note: The test data was only good for the test sample. It may have deviation for other test sample.

********** End of Page **********

PRODUCT PICTURES

Tb location



None Attachment

********** End of Report **********

LCTECH

IESNA SUSTAINING MEMBER

Ref. No.: LCZP20070080
Version: 1.0
Date of issue: Jul. 17, 2020
Total pages: 10

Test report of

In Situ Temperature Measurement and TM-21

Rendered to:

DANYANG BRIGHT-MOON LIGHTING CO., LTD
HUGUO ROAD, ERLING TOWN, DANYANG CITY, JIANGSU PROVINCE, CHINA

For products:

LED STREET LIGHT

Models No.:
BML-2018B-100W

Test Date: Jul. 15, 2020

Test Lab.: **LCTECH Guangdong Testing Services Co., Ltd.**
2/F., Technology and Enterprise Development Center, Guangyuan Road, Xiaolan, Zhongshan, Guangdong, China
Tel:+86-760-22833366 Fax:+86-760-22833399
E-mail:Service@lccert.com http://www.lccert.com

Test Sites: 2/F., Building II & 1/F., Building I, Technology and Enterprise Development Center, Guangyuan Road, Xiaolan, Zhongshan, Guangdong, China

Template No.: LC-RT-PL-015 Rev.1.3

Test Note: *N/A*

Complied by:	**Reviewed by:**
Kargel Yuan	**Henry Li**
Jul. 17, 2020	**Jul. 17, 2020**

Table of Contents

1. General

1.1 Product Information

Brand Name	-
Product Type	LED STREET LIGHT
Model Number	BML-2018B-100W
Rated Inputs	220-240VAC, 50/60Hz
Rated Power Rated Light output	100W 13000lm
Declared CCT	4000K
Power Supply	Model: Xi LP 100W 0.3-1.05A S1 230V I175, Brand Name: PHILIPS
LED Package, Array or Module	Model: JK3030-6V, manufactured by Cree, Inc.
Receipt Samples	1 unit
Sample Code of lab.	200713110001
Date of Receipt Samples	Jul. 13, 2020
Note	-

1.2 Standards or methods

The following standards are partly or totally used or referenced for test:

No.	Name
IEC 60598-1:2014+A1: 2017 Clause 12.4.1	Luminaires- Part 1: General requirements and tests
IES LM-80:2008*	Solid State Lighting Luminaires – Lumen Maintenance
IES LM-80:2015* IES TM-21-11	Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays and Modules Projecting Long Term Lumen Maintenance of LED Light Sources

Note:

**For reference only, IES LM-80-08 and IES LM-80-15 are not in the scope of CNAS(L3337) recognition.*

1.3 Equipment list

Instrument	ID	Model name	Cal. date	Next cal. Date
AC Power supply	LC-I-923	CHP-500	2020-01-06	2021-01-05
AC Power supply	LC-I-987	APW-120N	2020-01-06	2021-01-05
Power analyzer	LC-I-928	WT210	2019-12-26	2020-12-25
Power analyzer	LC-I-954	WT210	2019-12-29	2020-12-28
Multimeter	LC-I-972	Fluke 17B	2019-07-29	2020-07-28
J thermocouple	LC-I-096	TT-J-30-SLE(200 m/r)	2020-02-25	2021-02-24
Data acquisition/Switch unit	LC-I-098	34970A	2020-02-25	2021-02-24
T&H recorder	LC-I-958	DWRP-B(0)	2019-07-29	2020-07-28

2. Test conducted and method

The luminaire provided by the client was installed to simulate intended usage to record the maximum temperature that can be encountered under the intended use.

2.1 Ambient Condition

Test was conducted in an ambient temperature of 50 ± 10 °C. Ambient temperature variations above or below 50 °C was respectively subtracted from or added to temperatures recorded at points on the luminaire.

The ambient temperature was measured by a thermocouple which was immersed in 15 ml of mineral oil in a glass container which was placed in the horizontal plane passing through the midpoint of the luminaire's vertical axis at a horizontal distance from the luminaire equal to at least 3 times the luminaire diameter

2.2 Temperature Stabilization

Measurements were not taken until the luminaire has stabilized thermally whose temperatures is changing at a rate less than 1 °C per hour.

2.3 Thermocouples

Temperatures recorded at points on LED was measured by means of thermocouples. Type J thermocouple was used. The thermocouples have conductors of 0.05mm $_2$(30AWG), and complied with the requirements specified in ASTM MNL 12 and limits of error specified in NIST ITS 90 and ISA MC96.1.

2.4 Thermocouples contact

Thermocouples were directly in contact with the TMP $_{LED}$ location described in LM-80 test report. In order to gain the maximum temperature, if appropriate, more than one thermocouple were contact in these locations. For details information, please refer to clause 3.3 for the photo of thermocouple contact..

3. Test Result Summary

3.1 Electrical data

Criteria Item	Result
Input Voltage & Frequency	230.06 V~50Hz
Input Current(A)	0.416
Total Power(W)	93.98
Power Factor	0.983
Current on each LED(mA) *	39

3.2 Temperature data

Criteria Item	Result	
Total operated period(hours)	3.6	
Driver Output Current(mA)	700	
Numbers of LED in Luminaire	144	
The construction of the LEDs(parallel & strings)	18 in parallel and 8 in strings	
Average drive current of a LED array(mA) *	39	
Ambient temperature(℃)	50.7	
Measured Temperature @**TMP**$_{LED}$(℃)	LED1	81.0
	LED2	80.0
	LED3	78.1
Maximum Temperature @**TMP**$_{LED}$(Normalized to 50°C) (℃) **	**<u>80.3</u>**	

Note:

**There is one LED array connected in parallel within the product. Within each LED array, there are 18 strings connected in parallel. Within each strings, there are 8 LED chips connected in series. In total there are 144 LED chips used in the product. The average drive output current of the product is 700 mA by measured with a multimeter, there is one array connected in parallel, and the each LED array is 18 strings connected in parallel, calculated the current of each strings is 39 mA, this current is the average forward current of LEDs. The current is indirect test result and result of calculation.*

***TMP_{LED} was the maximum temperature LED which was selected based on the method of Annex A of IES LM-84-14.*

3.3 Lumen Maintenance Projection (IESNA TM-21 Method)

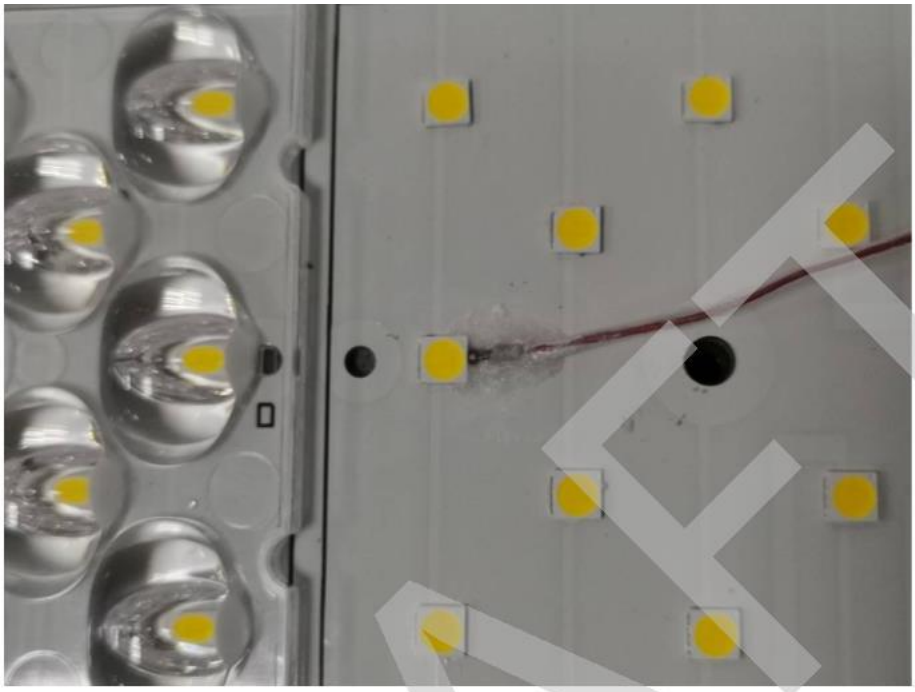
Criteria Item	Result
6000 hours lumen maintenance of LED light source	99.04%
Forward current on each LED light source *	39 mA
Reported L_{70} lumen maintenance life	**<u>>54000 hours</u>**

Note: Please refer to section3.6 for details of TM-21 inputs and results.

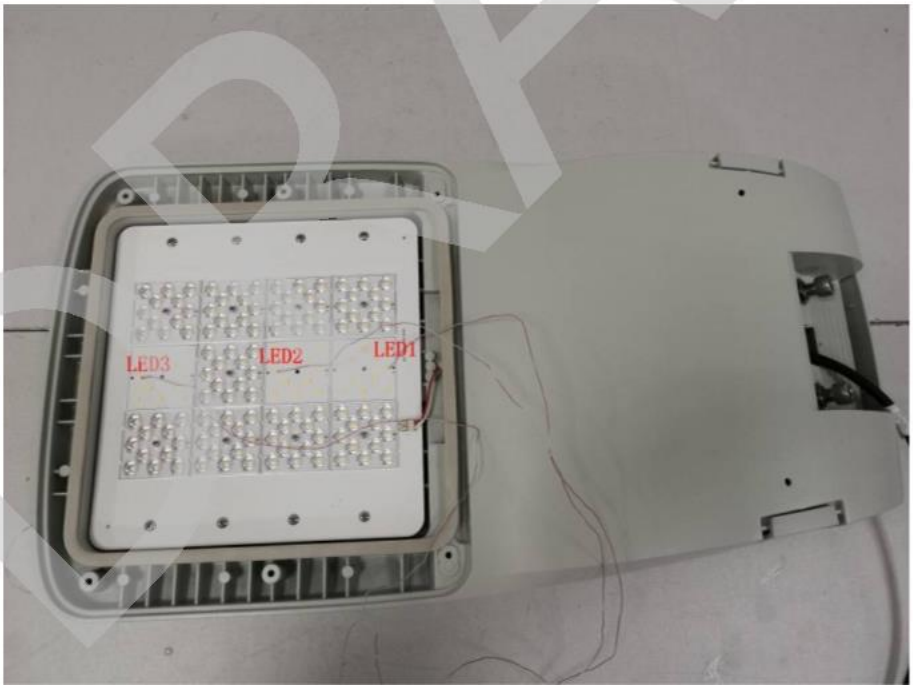
3.4 LM-80 Information

Report originated by	Cree, Inc.		
Manufactured by	Cree, Inc.		
LM-80 report No.	CLJ-AP3 REV1		
LED Model	JK3030-6V		
LED Part Number	JK3030-6V		
Number of LED light source tested	25 units per case temperature		
Drive Current	60mA		
Case temperature	55℃	85℃	105℃
lumen maintenance during 9000 hours test	98.79%	98.18%	97.65%
Color maintenance(Δu'v') during 9000 hours test	0.0021	0.0024	0.0026

3.5 Thermocouple Contact Photo



Part View



Over View

3.6 TM-21 input and output

TM-21 Inputs

Instructions
Yellow fields are completed by the user. Fields not used should be left blank. Cyan fields are calculated based on user entries. First, enter a description of the LED light source tested. Then complete the fields labeled "LM-80 Testing Details". Test duration must be at least 6,000 hours. If only one case temperature data set is to be used (no interpolation), complete only "Tested case temperature 1". For only two case temperature data sets, complete 1 and 2. Next, further to the right, in the corresponding box(es) for each tested case temperature, enter the test data along with the time (in hours) at which each measurement was taken. Data entered must be normalized then averaged measured data (per TM-21 sections 5.2.1 and 5.2.2). If case temperatures have different test durations, enter data up to the lowest of the test durations for all of the case temperatures. Enter drive current, *in-situ* temperature data and the percentage of initial lumens to project to in the fields labeled "*In-Situ* Inputs". Results can be tailored to estimate lumen maintenance at a specific time by entering a value (t) in the yellow field. A complete TM-21 report will appear on the next tab labeled "Report".

Description of LED Light Source Tested (manufacturer, model, catalog number)
Model: JK3030-6V, manufactured by Cree, Inc.

LM-80 Testing Details	
Total number of units tested per case temperature:	25
Number of failures:	0
Number of units measured:	25
Test duration (hours):	9000
Tested drive current (mA):	160
Tested case temperature 1 (T_c, °C):	55
Tested case temperature 2 (T_c, °C):	85
Tested case temperature 3 (T_c, °C):	105

***In-Situ* Inputs**

Drive current for each LED package/array/module (mA):	39
In-situ case temperature (T_c, °C):	80.3
Percentage of initial lumens to project to (e.g. for L_{70}, enter 70):	70

Results

Time (t) at which to estimate lumen maintenance (hours):	6,000
Lumen maintenance at time (t) (%):	99.04%
Reported L70 (hours):	>54000

LM-80 Test Inputs

Test Data for 55°C Case Temperature		Test Data for 85°C Case Temperature		Test Data for 105°C Case Temperature	
Time (hours)	Lumen Maintenance (%)	Time (hours)	Lumen Maintenance (%)	Time (hours)	Lumen Maintenance (%)
0	100.00%	0	100.00%	0	100.00%
500	100.23%	500	100.16%	500	100.05%
1000	100.31%	1000	100.22%	1000	100.11%
2000	100.16%	2000	99.97%	2000	99.75%
3000	99.98%	3000	99.73%	3000	99.38%
4000	99.76%	4000	99.45%	4000	99.04%
5000	99.58%	5000	99.14%	5000	98.77%
6000	99.41%	6000	98.90%	6000	98.47%
7000	99.22%	7000	98.68%	7000	98.21%
8000	99.01%	8000	98.44%	8000	97.94%
9000	98.79%	9000	98.18%	9000	97.65%

TM-21 Input

TM-21 Report

Table 1: Report at each LM-80 Test Condition

Description of LED Light Source Tested (manufacturer, model, catalog number)	Model: JK3030-6V, manufactured by Cree, Inc.		
Test Condition 1 - 55°C Case Temp	**Test Condition 2 - 85°C Case Temp**	**Test Condition 3 - 105°C Case Temp**	
Sample size	25	25	25
Number of failures	0	0	0
DUT drive current used in the test (mA)	160	160	160
Test duration (hours)	9,000	9,000	9,000
Test duration used for projection (hour to hour)	4,000 - 9,000	4,000 - 9,000	4,000 - 9,000
Tested case temperature (°C)	55	85	105
α	1.943E-06	2.507E-06	2.818E-06
B	1.006	1.004	1.002
Reported L70(9k) (hours)	>54000	>54000	>54000

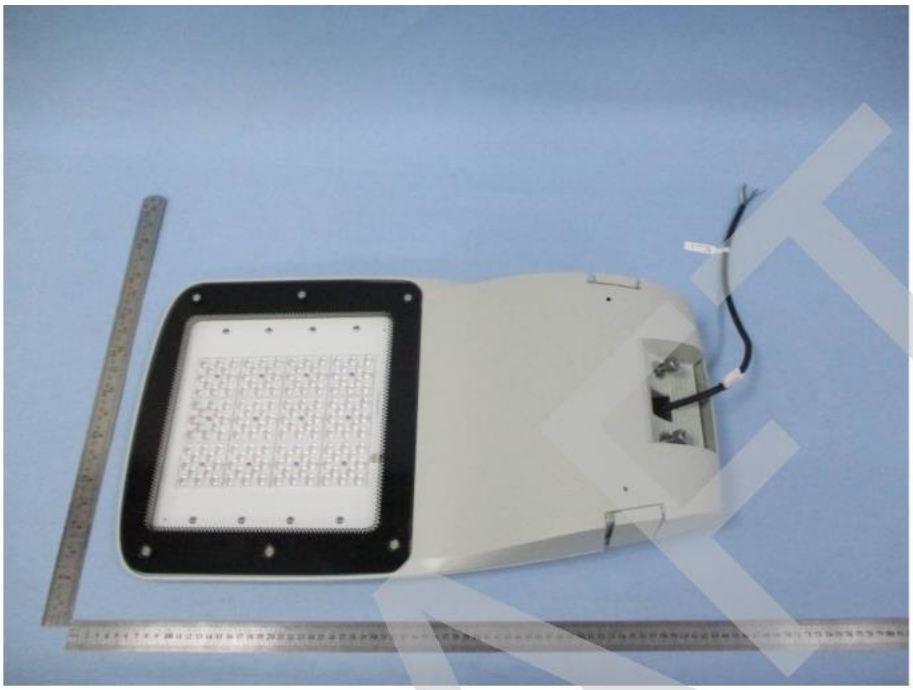
Table 2: Interpolation Report (projection based on *in-situ* temperature entered)

$T_{c,1}$ (°C)	55.00
$T_{c,1}$ (K)	328.15
α_1	1.943E-06
B_1	1.006
$T_{c,2}$ (°C)	85.00
$T_{c,2}$ (K)	358.15
α_2	2.507E-06
B_2	1.004
E_a/k_B	9.99E+02
A	4.083E-05
B_0	1.005
$T_{c,i}$ (°C)	80.30
$T_{c,i}$ (K)	353.45
α_i	2.416E-06
Reported L70(9k) at 80.3°C (hours)	>54000

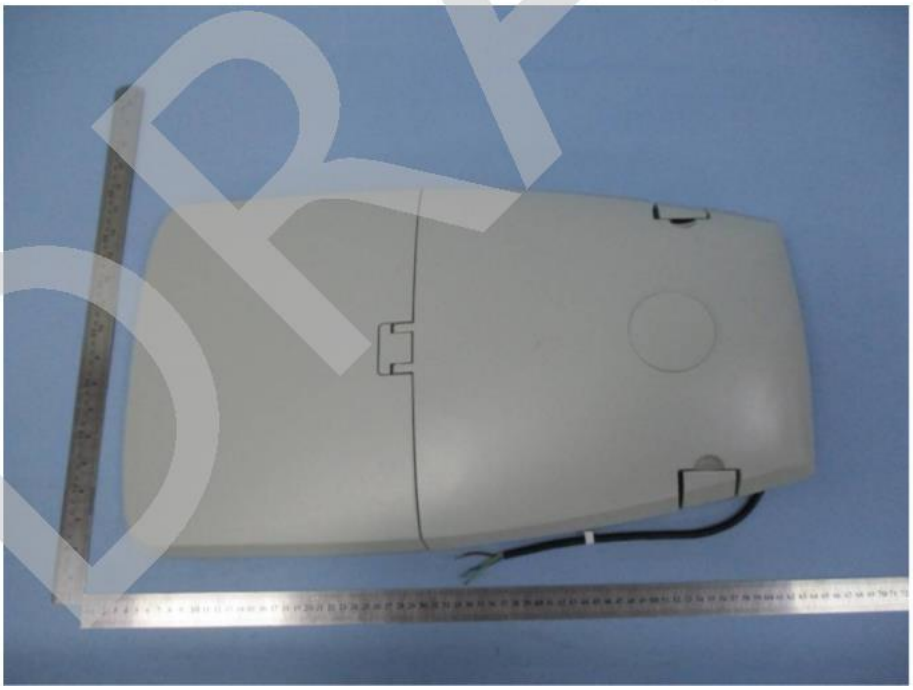
Report Generated By: Kargel Yuan	Notes:
Company: LCTECH Guangdong Testing Services Co., Ltd.	
Date: Jul. 17, 2020	

TM-21 Output

Appendix A Product Photo



Picture 1



Picture 2

****End of test report****