IECEx TEST REPORT COVER

ExTR Reference Number..... :	
ExTR Free Reference Number ..... :	CMExC/ExTR17005G02
Compiled by + signature (ExTL) .... :	Chen fandong
Reviewed by + signature (ExTL).... :	Liu yongming
Approved by + signature (ExCB) ... :	
Date of issue ..... :	
Ex Testing Laboratory (ExTL) ..... :	China National Quality Supervision &Test Center for Explosion-proof and Safety Products for Coal Mine (CMExC)
Address ..... :	No.11 Binhe Road Fushun Economic Development Area LiaoningP.R.China
Ex Certification Body (ExCB) ..... :	
Address ..... :	
Applicant's name..... :	HRLM Technology Incorporated Company
Address ..... :	No.15,West Henggang Street, Yangcheng Lake Town, Xiangcheng Disrict, Suzhou, Jiangsu, China
Standards associated with this ExTR package ..... :	IEC 60079-0:2011 IEC 60079-1:2014 IEC60079-31:2013
Clauses considered ..... :	All clauses considered
Related Amendments, Corrigenda or ISHs ..... :	IEC 60079-0:2011+ISH1:2013+ISH2:2014
Test item description..... :	Explosion-proof LED Lighting
Model/type reference ..... :	Type BZD130
Code (e.g. Ex __ II__ T__)..... :	Ex db ⅡC T5 Gb; Ex tb IIIC T95℃ Db .
Rating..... :	Rated working voltage:AC180~240V 50/60Hz

ExTR Package Contents
Assembled ExTR documents and Additional reference material:
IECEx Test Report Cover
IECEx Test Report: IEC 60079-_0_, Edition _6_
IECEx Test Report: IEC 60079-_1_, Edition _7_
IECEx Test Report: IEC 60079-_31_, Edition _2_

Manufacturer's name .....:	HRLM Technology Incorporated Company
Address .....:	No.15,West Henggang Street,Yangcheng Lake Town, Xiangcheng Disrict, Suzhou, Jiangsu, China
Trademark.....:	

Particulars: Test item vs. Test requirements

Classification of installation and use ..... :	Stationary
Ingress protection .....:	IP66
Rated ambient temperature range (°C).....:	-40°C to +55℃
Rated service temperature range (°C) for Ex Components .....:	No Ex component

General remarks:

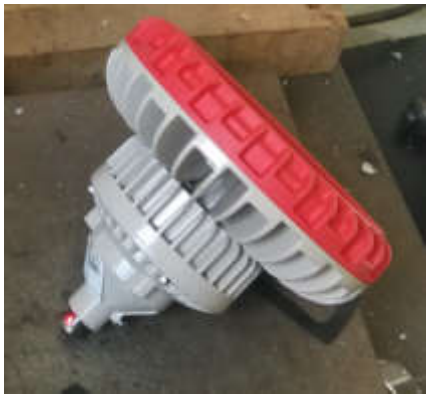
The test results presented in this ExTR package relate only to the item or product tested.

- "(See Attachment #)" refers to additional information appended to the ExTR package.
- "(See appended table)" refers to a table appended to the ExTR package.
- Throughout this ExTR package, a point is used as the decimal separator.
- *Where the term "N/A" appears in any part of an ExTR package, it indicates that the associated issue was considered "Not applicable" to the involved evaluation.*
- *In accordance with IECEx 02, a Receiving ExCB may request a sample of the Ex equipment and copies of the documentation referred to in an ExTR Cover.*

The technical content of this ExTR package shall not be reproduced except in full without the written approval of the Issuing ExCB and ExTL.

General product information:

Sample:



General product information:

BZD130 series explosion-proof LED lights are of type "d" and "tb". This product can be divided into three compartments: Connection cavity,power supply cavity and light source cavity. The enclosure material is ADC12 aluminum alloy with minimum thickness 3.0mm. The material of light transmitting part is toughened glass. There is one cable entry（M25×1.5）in connection cavity . Connection cavity and power supply cavity is divided by wiring board. There is LED driving power in power supply cavity . The wire-through part between power supply cavity and light source cavity are encapsulated with SY6002 polyurethane. There is MCPCB in light source cavity. The light transmitting is adhesive in enclosure.
Nomenclature:

BZD130-□□

Lamp power x: ceiling, g:pendant
b:bracket, f:flange, h:fence
Lights Type: (20W, 30W, 40W, 50W,60W,80W, 100W, 120W)

Design No.
Explosion-proof LED lights

Modle	Lights Type	Rated Power
BZD130	I	20W, 30W, 40W
	II	50W, 60W, 80W
	III	100W, 120W

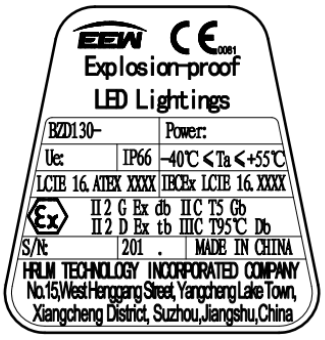
Installation angle: vertically downward, downward 60° and downward 30°.

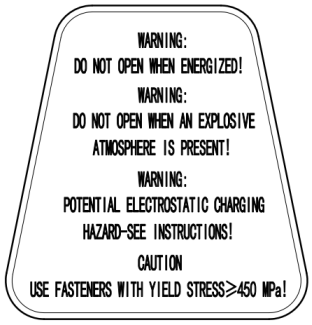
Details of change (applicable only when revising an existing ExTR package):

This is the first time to get certificate, no change.

Copy of Marking Plate:

Pic. Nameplate





Details regarding 'trade agent' / 'local assembler' application in accordance with OD 203:

N/A

In accordance with OD 024, testing not fully performed by ExTL staff at the above ExTL address:

N/A

National differences considered as part of this evaluation:

N/A

"Specific Conditions of Use" / "Schedule of Limitations":

1. Repair of the threaded joints must be made in compliance with the structural specifications provided by the manufacturer. Repairs must not be made on the basis of values specified in table 3 and table 4 of IEC 60079-1:2014.
2. When assembly, operation and maintenance, the operator should follow the requirements of IEC 60079-14:2007.
3. The enclosure is made of metallic material with a spraying layer.There is potential electrostatic charging hazard. Please see instruction to minimize the risk.
4. Cable glands without a clamping device are used in this light. such cable glands may not provide sufficient clamping and that the user shall provide additional clamping of the cable to ensure that pulling

and twisting is not transmitted to the terminations.

Routine tests:

The enclosure should be tested by static overpressure test with following test pressure within 10-60 seconds.

type	the test pressure
Connection cavity	1700 kPa
Power supply cavity	1500 kPa
Light source cavity	1200 kPa

Technical Documents

Title:	Drawing No.:	Rev. Level:	Date:
Technical file	BZD130_ATEX_01	A.01	26/07/ 2016
Instruction for applying certificate	8HRLM 993 1185	A.01	26/07/ 2016
Instruction Manual	8HRLM 993 1184	A.01	26/07/ 2016
Material quality report of ADC12	ADC12	A.01	26/07/ 2016
Material quality report of H59	H59	A.01	26/07/ 2016
Material quality report of BMC	BMC	A.01	26/07/ 2016
Material quality report of Silicon rubber	Silicon rubber	A.01	26/07/ 2016
Material quality report of 204-1	204-1	A.01	26/07/ 2016
Material quality report of SY6002	SY6002	A.01	26/07/ 2016
Operation instruction for SY6002	Q/HRLM J017.1-2013	A.01	18/02/ 2014
Hydrostatic Test Stipulation	Q/HRLM J053.1-2013	A.01	18/02/ 2014
Operation instruction for dielectric strength test	Q/HRLM J3005.1-2013	A.01	18/02/ 2014
BZD130-I series/ Drawing list	2HRLM 511 1118TM	A.01	26/07/ 2016
BZD130-I series explosion-proof LED lightings	2HRLM 511 1118.1	A.01	12/07/ 2016
BZD130-II series explosion-proof LED lightings	2HRLM 511 1118.2	A.01	12/07/ 2016
BZD130-III series explosion-proof LED lightings	2HRLM 511 1118.3	A.01	12/07/ 2016
Wiring board	5HRLM 064 1021	A.01	26/07/ 2016
Cacity of power supply_BZD130-I	8HRLM 003 1571	A.01	12/07/ 2016
Cacity of light source _BZD130-I	8HRLM 003 1572	A.01	12/07/ 2016
Cacity of power supply_BZD130-II	8HRLM 003 1646	A.01	12/07/ 2016

Cacity of light source _BZD130-II	8HRLM 003 1647	A.01	26/07/ 2016
Cacity of light source _BZD130-III	8HRLM 003 1648	A.01	26/07/ 2016
Enclosure ring _BZD130-I	8HRLM 013 1051	A.01	12/07/ 2016
Enclosure ring _BZD130-II	8HRLM 013 1052	A.01	12/07/ 2016
Enclosure ring _BZD130-III	8HRLM 013 1053	A.01	12/07/ 2016
Clamp plate _BZD130-II	8HRLM 128 1065	A.01	12/07/ 2016
Clamp plate _BZD130-III	8HRLM 128 1066	A.01	12/07/ 2016
Clamp plate _BZD130-I	8HRLM 128 1067	A.01	12/07/ 2016
Joint sleeve_BZD130-I	8HRLM 313 1298	A.01	12/07/ 2016
Joint sleeve_BZD130-II	8HRLM 313 1617	A.01	12/07/ 2016
Plug_M16	8HRLM 325 1071	A.01	26/07/ 2016
Wire sleeve	8HRLM 354 1043	A.01	12/07/ 2016
Sealing ring_10	8HRLM 370 1196	A.01	12/07/ 2016
Sealing ring_12	8HRLM 370 1197	A.01	12/07/ 2016
Sealing ring_14	8HRLM 370 1198	A.01	12/07/ 2016
Glass cover	8HRLM 402 1164	A.01	12/07/ 2016
Glass cover	8HRLM 402 1165	A.01	12/07/ 2016
Glass cover	8HRLM 402 1166	A.01	12/07/ 2016
Caution plate	8HRLM 860 1372	A.01	12/07/ 2016
Name plate	8HRLM 860 1373	A.01	12/07/ 2016
Signboard	8HRLM 865 1072	A.01	12/07/ 2016
Insert round nut	8HRLM 940 1265	A.01	26/07/ 2016
Gland nut	8HRLM 940 1325	A.01	12/07/ 2016
Gasket	8HRLM 950 1087	A.01	12/07/ 2016

*Note: An * is included before the title of documents that are new or revised.*

IECEx TEST REPORT
IEC 60079-0
Explosive atmospheres – Part 0:
Equipment – General requirements

ExTR Reference Number..... :	
ExTR Free Reference Number ..... :	CMExC/ExTR17005G02
Compiled by + signature (ExTL) .... :	Chen fandong
Reviewed by + signature (ExTL).... :	Liu yongming
Approved by + signature (ExTL).... :	Zhu shian
Date of issue ..... :	

Ex Testing Laboratory (ExTL)..... :	China National Quality Supervision &Test Center for Explosion-proof and Safety Products for Coal Mine (CMExC)
Address ..... :	No.11 Binhe Road Fushun Economic Development Area LiaoningP.R.China
Applicant's name..... :	HRLM technology Incorporated Company
Address ..... :	No.15,West Henggang Street,Yangcheng Lake Town, Xiangcheng Disrict, Suzhou, Jiangsu, China
Standard..... :	IEC 60079-0:2011, 6th Edition
Test procedure..... :	IECEx System
Test Report Form Number..... :	ExTR60079-0_6B (released 2011-08)

Instructions for Intended Use of Ex Test Report:
An Ex Test Report provides a clause-by-clause documentation of the initial evaluation and testing that verified compliance of an item or product with an IEC Ex standard. This Ex Test Report is part of an ExTR package that may include other Ex Test Report, Addendum, National Differences and Partial Testing documents, along with a single ExTR Cover. An Ex Test Report is to be compiled and reviewed by the ExTL. The Issuing ExCB indicates final approval of the Ex Test Report as part of the overall ExTR package on the associated ExTR Cover.

Possible test case verdicts:

- test case does not apply to the test item .....:N / A

- test item does meet the requirement .....:Pass

General remarks:
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- "(see appended table)" refers to a table appended to this document.
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IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
1	Scope		
2	Normative references		
3	Terms and definitions		
4	Equipment grouping		
4.1	Group I	Not group I	N/A
4.2	Group II	IIC T5,Gb	Pass
4.3	Group III	IIIC T95℃,Db	Pass
4.4	Equipment for a particular explosive atmosphere	The BZD130 series explosion-proof LED Lightings is not intend to be used in a particular explosive atmosphere.	N/A
5	Temperatures		
5.1	Environmental influences		
5.1.1	Ambient temperature	-40℃≤Tamb≤ +55℃	Pass
5.1.2	External source of heating or cooling	No external source of heating or cooling.	N/A
5.2	Service temperature	Use maximum surface temperature instead of Service temperature. Determination of maximum surface temperature was carried out according to 26.5.1 clause of IEC 60079-0:2011, 14 clause of IEC 60079-1:2014.	Pass
5.3	Maximum surface temperature		
5.3.1	Determination of maximum surface temperature	T5: Not more than 100℃ Determination of maximum surface temperature was carried out according to 26.5.1 clause of IEC 60079-0:2011.	Pass
5.3.2	Limitation of maximum surface temperature		
5.3.2.1	Group I electrical equipment	Not group I equipment.	N/A

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
5.3.2.2	Group II electrical equipment	T5, refer to 26.5.1 clause of IEC 60079-0:2011.	Pass
5.3.2.3	Group III electrical equipment		
5.3.2.3.1	Maximum surface temperature determined without a dust layer	T95℃, the maximum surface temperature of enclosure does not exceed 95℃. For more details, see IEC 60079-0 clause 26.5 .1 of this report.	Pass
5.3.2.3.2	Maximum surface temperature with respect to dust layers	The maximum surface temperature is determined without a dust layer.	N/A
5.3.3	Small component temperature for Group I or Group II electrical equipment	Not small component.	N/A

6	Requirements for all electrical equipment		
6.1	General	Complies with IEC 60079-0:2011, IEC 60079-1:2014, IEC 60079-31:2013.	Pass
6.2	Mechanical strength of equipment	See clause 26.4. The impact test is made on the BZD130 series Explosion-proof LED Lightings. Refer to report IEC 60079-0:2011 clause 26.4.2.	Pass
6.3	Opening times	Refer to 26.5.1，the surface temperature of LED driving power is 118.0℃，higher than T5. A warning mark “WARNING – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT” is provided.	Pass
6.4	Circulating currents in enclosures (e.g. of large electrical machines)	No circulating currents.	N/A
6.5	Gasket retention	1) O rings(item 7/23/29 of drawing 2HRLM 511 1118.1, item 7/9/19 of drawing 2HRLM 511 1118.2 ,item 7/9/19 of drawing 2HRLM 511 1118.3) are located in the grooves.	Pass
6.6	Electromagnetic and ultrasonic energy radiating equipment	No electromagnetic and ultrasonic energy radiating equipment.	N/A
6.6.1	Radio frequency sources	No electromagnetic and ultrasonic energy radiating equipment.	N/A
6.6.2	Lasers or other continuous wave sources	No electromagnetic and ultrasonic energy radiating equipment.	N/A
6.6.3	Ultrasonic sources	No electromagnetic and ultrasonic energy radiating equipment.	N/A

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
7	Non-metallic enclosures and non-metallic parts of enclosures		
7.1	General		
7.1.1	Applicability	1） See assembly drawing, the cemented material is SY 6002 polyurethane, and the cemented material is use d in between wiring board and joint sleeve, between glass cover and enclosure ring, between cavity of ligh t source and cavity of power supply. 2） The material of O rings(item 7/23/29 of drawing 2HR LM 511 1118.1, item 7/9/19 of drawing 2HRLM 511 1118.2 ,item 7/9/19 of drawing 2HRLM 511 1118. 3) is silicon rubber. 3） The material of sealing ring(item 3 of drawing 2HRLM 511 1118.1, item 3 of drawing 2HRLM 511 1118.2 ,item 3 of drawing 2HRLM 511 1118.3) is silicon ru bber. 4） Spraying layer enclosure (refer to drawing 2HRLM 5 11 1118.1,2HRLM 511 1118.2and 2HRLM 511 11 18.3). 5） The material of glass cover (item 14 of drawing 2HRL M 511 1118.1, item 20 of drawing 2HRLM 511 111 8.2 ,item 21 of drawing 2HRLM 511 1118.3) is tou ghened well glass. 6） The material of base of wiring board (refer to drawing 5HRLM 064 1021) is BMC.	Pass
7.1.2	Specification of materials		
7.1.2.1	General	Refer to the documents provided by the manufacturer.	Pass
7.1.2.2	Plastic materials	Base of wiring board (refer to drawing 5HRLM 064 1021) is made of BMC. Manufactured by Yueqing Tianhua Shuzhi Manufacturer. RTI:135°C, More information see document of Material quality report of BMC	Pass
7.1.2.3	Elastomers	1) The material of O rings(item 7/23/29 of drawing 2HRLM 511 1118.1, item 7/9/19 of drawing 2HRLM 511 1118.2 ,item 7/9/19 of drawing 2HRLM 511 1118.3) is silicon rubber. 2) The material of sealing ring(item 3 of drawing 2HRLM 511 1118.1, item 3 of drawing 2HRLM 511 1118.2 ,item 3 of drawing 2HRLM 511 1118.3) is silicon rubber. Manufactured by Jiangsu Richeng Rubber Co.,Ltd. COT is -50°C to +220°C, more information see document of Material quality report of Silicon rubber. 3) See assembly drawing, the cemented material is SY6002 polyurethane, and the cemented material is used in between wiring board and joint sleeve, between glass cover and enclosure ring, between cavity of light source and cavity of power supply. Manufactured by Changzhou Shuguang Chemical Plant. COT is -50°C to +220°C， more information see document of Material quality report of SY6002.	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
7.2	Thermal endurance		
7.2.1	Tests for thermal endurance	Refer to Cl. 26.8 and Cl. 26.9 in this test report for tests for thermal endurance.	Pass
7.2.2	Material selection	The service temperature of non-metallic parts is at least 20K lower than the COT or RTI of non-metallic parts. Refer to Cl.26.5.1 in this test report. The maximum temperature of O ring (silicon rubber) is 91.5℃. The COT of it is -50 ℃～+220℃. The maximum temperature of sealing ring(silicon rubber) is 67.0℃. The COT of it is -50 ℃～+220℃. The maximum temperature of cementing material(SY6002 polyurethane) is 89.4℃. The COT of it is -50 ℃～+220℃. The maximum temperature of BMC is 93.1℃. The RTI of it is 135 ℃.	Pass
7.2.3	Alternative qualification of elastomeric sealing O-rings	Alternative qualification of elastomeric sealing O-ring is not used.	N/A
7.3	Resistance to light	The non-metal parts of enclosure are not exposed to light.	N/A
7.4	Electrostatic charges on external non-metallic materials		
7.4.1	Applicability	The enclosure is made of metal and covered with spraying layer. The 3M-PVC caution plate , signboard and nameplate is on the enclosure cover.	Pass
7.4.2	Avoidance of a build-up of electrostatic charge on Group I or Group II electrical equipment	The thickness of spraying layer(drawing 2HRLM 511 1118.1, 2HRLM 511 1118.2 , 2HRLM 511 1118.3) is not more than 0.2mm. The surface area of 3M-PVC caution plate, signboard and nameplate (drawing 8HRLM 865 1072, 8HRLM 860 1373 and 8HRLM 860 1372) is less 2000mm^2.	Pass
7.4.3	Avoidance of a build-up of electrostatic charge on equipment for Group III	The enclosure is made of metallic material with a spraying layer, and “WARNING – POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS” is provided. Marking the certificate with symbol ‘X’. The method of minimize the risk from electrostatic discharge is provided in the instructions.	Pass
7.5	Accessible metal parts	The enclosure is made of metal	N/A
8	Metallic enclosures and metallic parts of enclosures		

<table>
<tr><td colspan="4">IEC 60079-0</td></tr>
<tr><td>Clause</td><td>Requirement – Test</td><td>Result – Remark</td><td>Verdict</td></tr>
<tr><td>8.1</td><td>Material composition</td><td>See drawings, the enclosure is made of ADC12.</td><td>Pass</td></tr>
<tr><td>8.2</td><td>Group I</td><td>Not Group I equipment.</td><td>N/A</td></tr>
<tr><td>8.3</td><td>Group II</td><td>See the material quality report of ADC12， ADC 12 contains 0.25% Mg and no Ti.</td><td>Pass</td></tr>
<tr><td>8.4</td><td>Group III</td><td>See the material quality report of ADC12， ADC 12 contains 0.25% Mg and no Ti.</td><td>Pass</td></tr>
<tr><td>9</td><td colspan="3">Fasteners</td></tr>
<tr><td>9.1</td><td>General</td><td>Released or removed only with the aid of a tool.
Fasteners material is of 304 stainless steel.
The fasteners are listed as the following sheet:
BZD130-Ⅰ:
<table>
<tr><td>Type</td><td>Bolt Size</td><td>Bolt Quantity</td></tr>
<tr><td>Connection cavity</td><td>M6×30</td><td>3</td></tr>
<tr><td>Power supply cavity</td><td>M6×14</td><td>3</td></tr>
<tr><td>Light source cavity</td><td>M6×14</td><td>6</td></tr>
</table>
BZD130-Ⅱ:
<table>
<tr><td>Type</td><td>Bolt Size</td><td>Bolt Quantity</td></tr>
<tr><td>Connection cavity</td><td>M6×18</td><td>3</td></tr>
<tr><td>Power supply cavity</td><td>M6×16</td><td>4</td></tr>
<tr><td>Light source cavity</td><td>M6×14</td><td>16</td></tr>
</table>
BZD130-Ⅲ：
<table>
<tr><td>Type</td><td>Bolt Size</td><td>Bolt Quantity</td></tr>
<tr><td>Connection cavity</td><td>M6×18</td><td>3</td></tr>
<tr><td>Power supply cavity</td><td>M6×16</td><td>4</td></tr>
<tr><td>Light source cavity</td><td>M6×14</td><td>16</td></tr>
</table>
The fasteners are hexagon socket head cap screws.</td><td>Pass</td></tr>
</table>

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
9.2	Special fasteners	The hexagon socket head cap screws are used to fasten the enclosure and the chamber plate. The hexagon socket head cap screws and the holes for fasteners complies with 6g/6H in accordance with ISO 965-1 and ISO 965-3. The hexagon socket head cap screws in accordance with ISO 4762.	Pass
9.3	Holes for special fasteners		
9.3.1	Thread engagement	The least depth of thread (8mm) is greater than the outside diameter of fasten bolt (M6),refer to the drawing 8HRLM 013 1051.	Pass
9.3.2	Tolerance and clearance	The holes of hexagon socket head cap screws have a tolerance class of 6H, the hole under the head of the associated fastener shall allow a clearance not greater than a medium tolerance class of H13 in accordance with ISO 273. The thread holes for all bolts comply with 6H.	Pass
9.3.3	Hexagon socket set screws	All of these hexagon socket set screws have a tolerance class of 6h in accordance with ISO 965-1 and ISO 965-3. All of them do not protrude from the threaded hole after tightening.	Pass
10	Interlocking devices	No interlocking devices.	N/A
11	Bushings	1. The encapsulation material（refer to drawing 2HRLM 511 1118.1,2HRLM 511 1118.2and 2HRLM 511 111 8.3） is SY6002 polyurethane; The maximum temperature of bush (SY6002 polyurethane) is 84.2℃, The COT of SY6002 polyurethane is -50℃～+220℃. 2. The material of base of wiring board (refer to drawing 5HRLM 064 1021) is BMC. RTI of BMC is 135°C. Refer to Cl.26.6, do not turn.	Pass
12	Materials used for cementing	See assembly drawing, the cemented material is SY6002 polyurethane, and the cemented material is used in between wiring board and joint sleeve, between glass cover and enclosure ring, between cavity of light source and cavity of power supply. The COT of SY6002 polyurethane is -50℃～+220℃, more information see document of Material quality report of SY6002.	Pass
13	Ex Components		
13.1	General	No Ex Components	N/A

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
13.2	Mounting	No Ex Components	N/A
13.3	Internal mounting	No Ex Components	N/A
13.4	External mounting	No Ex Components	NA
13.5	Ex Component certificate	No Ex Components	N/A
14	Connection facilities and terminal compartments		
14.1	General	The terminals for external circuit are installed inside the flameproof enclosure.	Pass
14.2	Termination compartment	See drawing 8HRLM 313 1298 and 8HRLM 313 1617, the access of terminal compartment is a ϕ86 mm round opening, and the conductors is readily connected	Pass
14.3	Type of protection	Terminal compartment is of type “d” and “tb”.	Pass
14.4	Creepage and clearance	Terminal compartment is of type “d” and “tb”. Refer to 19.2.1 clause of IEC 60079-1:2014.	Pass
15	Connection facilities for earthing or bonding conductors		
15.1	Equipment requiring earthing		
15.1.1	Internal	See assembly drawing, the internal earthing connection facility is an M5 bolt, which is inside the terminal compartment.	Pass
15.1.2	External	See assembly drawing, the external earthing connection facility is an M5 bolt, which is outside the enclosure.	Pass
15.2	Equipment not requiring earthing	Requiring earthing.	N/A
15.3	Size of conductor connection	The sample was connected to earth effectively. The cross-sectional area of external conductor is 4mm^2 at least.	Pass
15.4	Protection against corrosion	The bolt for earthing is made of 304 stainless steel.	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
15.5	Secureness of electrical connections	Earthing connection assemblies with washer, spring washer, to prevent lead conductors loosen and twist, and maintain contact pressure.	Pass
16	Entries into enclosures		
16.1	General	Entry into the equipment by threaded hole located in the wall of the enclosure. Threaded hole is M25×1.5.	Pass
16.2	Identification of entries	For entry location, type, size and maximum number allowed, see the instruction. The size of threaded (M25×1.5) is marked on the equipment by signboard.	Pass
16.3	Cable glands	Entry and the shell is as a whole. Thread specification of the entry hole is specified in the instructions	Pass
16.4	Blanking elements	NO blanking elements.	N/A
16.5	Thread adapters	No thread adapters.	N/A
16.6	Temperature at branching point and entry point	See clause 26.5.1 of standard IEC 60079-0. The maximum temperature is 67.0℃ at the cable branching point.	Pass
16.7	Electrostatic charges of cable sheaths	No cable sheaths.	N/A
17	Supplementary requirements for rotating machines		
17.1	Ventilation		
17.1.1	Ventilation openings	No rotating electrical machines.	N/A
17.1.2	Materials for external fans	No rotating electrical machines.	N/A
17.1.3	Cooling fans of rotating machines		
17.1.3.1	Fans and fan hoods	No rotating electrical machines.	N/A
17.1.3.2	Construction and mounting of the ventilating systems	No rotating electrical machines.	N/A
17.1.3.3	Clearances for the ventilating system	No rotating electrical machines.	N/A
17.1.4	Auxiliary motor cooling fans	No rotating electrical machines.	N/A
17.1.5	Ventilating fans		
17.1.5.1	Applicability	No rotating electrical machines.	N/A

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
17.1.5.2	General	No rotating electrical machines.	N/A
17.1.5.3	Fan and fan hoods	No rotating electrical machines.	N/A
17.1.5.4	Construction and mounting	No rotating electrical machines.	N/A
17.1.5.5	Clearances for rotating parts	No rotating electrical machines.	N/A
17.2	Bearings	No rotating electrical machines.	N/A
18	Supplementary requirements for switchgear		
18.1	Flammable dielectric	No switchgear	N/A
18.2	Disconnectors	No switchgear	N/A
18.3	Group I – Provisions for locking	No switchgear	N/A
18.4	Doors and covers	No switchgear	N/A
19	Supplementary requirements for fuses	Fuses are not included.	N/A
20	Supplementary requirements for plugs, sockets outlets and connectors		
20.1	General	No plugs, sockets, outlets or connectors.	N/A
20.2	Explosive gas atmospheres	No plugs, sockets, outlets or connectors.	N/A
20.3	Explosive dust atmospheres	No plugs, sockets, outlets or connectors.	N/A
20.4	Energized plugs	No plugs, sockets, outlets or connectors.	N/A
21	Supplementary requirements for luminaries		
21.1	General	No protection guard. Refer to Cl.26.4.2 for relevant tests.	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
21.2	Covers for luminaries of EPL Mb, EPL Gb, or EPL Db	The BZD130 series explosion-proof LED Lightings have warning words “WARNING – DO NOT OPEN WHEN ENERGIZED” on the enclosure.	Pass
21.3	Covers for luminaries of EPL Gc or EPL Dc	Gb and Db equipment.	N/A
21.4	Sodium lamps	LED sources.	N/A
22	Supplementary requirements for cap lights and hand lights		
22.1	Group I cap lights	No cap lights or hand lights.	N/A
22.2	Group II and Group III cap lights and hand lights	No cap lights or hand lights.	N/A
23	Apparatus incorporating cells and batteries		
23.1	General	No cells and batteries.	N/A
23.2	Batteries	No cells and batteries.	N/A
23.3	Cell types	No cells and batteries.	N/A
23.4	Cells in a battery	No cells and batteries.	N/A
23.5	Ratings of batteries	No cells and batteries.	N/A
23.6	Interchangeability	No cells and batteries.	N/A
23.7	Charging of primary batteries	No cells and batteries.	N/A
23.8	Leakage	No cells and batteries.	N/A
23.9	Connections	No cells or batteries.	N/A
23.10	Orientation	No cells and batteries.	N/A
23.11	Replacement of cells or batteries	No cells and batteries.	N/A

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
23.12	Replaceable battery pack	No cells and batteries.	N/A
24	Documentation	Relevant documentation which was provided by the manufacturer complies with IEC 60079-0, IEC 60079-1, IEC 60079-31.	Pass
25	Compliance of prototype or sample with documents	The samples comply with manufacturer's documentation.	Pass
26	Type tests		
26.1	General	Tests were carried out according to IEC60079-0, IEC60079-1 and IEC60079-31 in the Labs of CMExC.	Pass
26.2	Test configuration	Every test has been made in that configuration which is considered to be the most unfavourable by the testing station.	Pass
26.3	Tests in explosive test mixtures	Explosive test mixtures used in tests comply with the requirements of standard in IEC60079-1.	Pass
26.4	Tests of enclosures		
26.4.1	Order of tests		
26.4.1.1	Metallic enclosures, metallic parts of enclosures and glass parts of enclosures	See clause 26.4.1.2.2.	Pass
26.4.1.2	Non-metallic enclosures or non-metallic parts of enclosures	Tests were applied to non-metallic materials identified in clause 7.1.1 excepting glass cover.	Pass
26.4.1.2.1	Group I electrical equipment	Group II and group III equipment.	N/A
26.4.1.2.2	Group II and Group III electrical equipment	Six samples(two BZD130-Ⅰ,two BZD130-Ⅱ, two BZD130-Ⅲ) were used in the following tests Tests were performed in the following order: 1. Thermal tests 2. Thermal endurance to heat. 3. Thermal endurance to cold. 4. Impact test. 5. IP test. 6. Other tests according to relative standards.	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
26.4.2	Resistance to impact	Place of impact: enclosure Impact energy: 7J Temperature: -50.0℃ Number of samples: 6(two BZD130-Ⅰ,two BZD130-Ⅱ, two BZD130-Ⅲ) Times of impact: two separate places on each sample Place of impact:light-transmitting parts Impact energy: 4J Temperature: -50.0℃ Number of samples: 6(two BZD130-Ⅰ,two BZD130-Ⅱ, two BZD130-Ⅲ) Times of impact: once on each sample	Pass
26.4.3	Drop test	Not portable apparatus.	N/A
26.4.4	Acceptance criteria	No damage affecting the explosion-proof performance has been found.	Pass
26.4.5	Degree of protection (IP) by enclosures		
26.4.5.1	Test procedure	The test procedure is according to IEC 60529. The protection degree is IP66.	Pass
26.4.5.2	Acceptance criteria	No ingress of dust or water after tests for degree of protection by enclosure.	Pass

26.5	Thermal tests		
26.5.1	Temperature measurement		
26.5.1.1	General	The service voltage range is 100V～240VAC. The maximum surface temperature was measured under the voltage of 264V. The test is carried out in three directions: vertically downward, downward 30° and downward 60°. The power of BZD130-Ⅲ is100W and 120W. The power of BZD130-Ⅱ is 50W,60W and 80W. The power of BZD130-Ⅰ is 20W,30W and 40W. The test sample is 120W of BZD130-Ⅲ,80W of BZD130-Ⅱ and 40W of BZD130-Ⅰ.	Pass
26.5.1.2	Service temperature	Use maximum surface temperature instead of the maximum service temperature.	Pass

<table>
<tr><td colspan="4">IEC 60079-0</td></tr>
<tr><td>Clause</td><td>Requirement – Test</td><td>Result – Remark</td><td>Verdict</td></tr>
<tr><td>26.5.1.3</td><td>Maximum surface temperature</td><td>1. The BZD130-Ⅲ (120W);
Test voltage: 264VAC;
<table>
<tr><td rowspan="2">Position</td><td colspan="3">Test Temperature (℃)</td></tr>
<tr><td>vertically downward</td><td>downward 60°</td><td>downward 30°</td></tr>
<tr><td>Max. glass cover</td><td>50.0</td><td>48.2</td><td>45.3</td></tr>
<tr><td>Max. sealing ring</td><td>24.9</td><td>21.8</td><td>17.9</td></tr>
<tr><td>Max. enclosure</td><td>40.8</td><td>38.3</td><td>34.7</td></tr>
<tr><td>Max. O ring</td><td>46.3</td><td>46.0</td><td>48.3</td></tr>
<tr><td>Max. wiring board(BMC)</td><td>48.7</td><td>51.0</td><td>40.3</td></tr>
<tr><td>Max.LED driving power</td><td>75.9</td><td>73.6</td><td>66.2</td></tr>
<tr><td>Max. cementing material(SY6002 polyurethane)</td><td>46.7</td><td>46.8</td><td>46.2</td></tr>
<tr><td>Entry point</td><td>19.1</td><td>17.7</td><td>16.3</td></tr>
<tr><td>Branching point</td><td>24.9</td><td>21.8</td><td>17.9</td></tr>
<tr><td>Test environmental temperature</td><td>12.9</td><td>12.9</td><td>11.8</td></tr>
<tr><td>Max. MCPCB LED</td><td>51.5</td><td>50.4</td><td>49.0</td></tr>
</table>
When the ambient temperature is 55℃，the correct temperature is in the following table.
<table>
<tr><td rowspan="2">Position</td><td colspan="3">Correct Temperature (℃)</td></tr>
<tr><td>vertically downward</td><td>downward 60°</td><td>downward 30°</td></tr>
<tr><td>Max. glass cover</td><td>92.1</td><td>90.3</td><td>88.5</td></tr>
<tr><td>Max. sealing ring</td><td>67.0</td><td>63.9</td><td>61.1</td></tr>
<tr><td>Max. enclosure</td><td>82.9</td><td>80.4</td><td>77.9</td></tr>
<tr><td>Max. O ring</td><td>88.4</td><td>88.1</td><td>91.5</td></tr>
<tr><td>Max. wiring board(BMC)</td><td>90.8</td><td>93.1</td><td>83.5</td></tr>
<tr><td>Max.LED driving power</td><td>118.0</td><td>115.7</td><td>109.4</td></tr>
<tr><td>Max. cementing material(SY6002 polyurethane)</td><td>88.8</td><td>88.9</td><td>89.4</td></tr>
<tr><td>Entry point</td><td>61.2</td><td>59.8</td><td>59.5</td></tr>
<tr><td>Branching point</td><td>67.0</td><td>63.9</td><td>61.1</td></tr>
<tr><td>Test environmental temperature</td><td>/</td><td>/</td><td>/</td></tr>
<tr><td>Max. MCPCB LED</td><td>93.6</td><td>92.5</td><td>92.2</td></tr>
</table>
1）The maximum surface temperature is 92.1℃,less than 100℃,complying with the temperature class assigned T5 for Group II and the maximum surface temperature assigned T95℃ for GroupⅢ
2) The service temperature of sealing ring is 67.0℃.
The service temperature of O ring is 91.5℃.
The service temperature of cementing material is 89.4℃.
The service temperature of wiring board is 93.1℃.
3) The maximum surface temperature of LED driving power is 118.0℃.</td><td>Pass</td></tr>
</table>

<table>
<tr><th colspan="4">IEC 60079-0</th></tr>
<tr><th>Clause</th><th>Requirement – Test</th><th>Result – Remark</th><th>Verdict</th></tr>
<tr><td>26.5.1.3</td><td>Maximum surface temperature</td><td>2. BZD130- II (80W)
Test voltage: 264VAC; .
<table>
<tr><th rowspan="2">Position</th><th colspan="3">Test Temperature (℃)</th></tr>
<tr><th>vertically downward</th><th>downward 60°</th><th>downward 30°</th></tr>
<tr><td>Max. glass cover</td><td>44.6</td><td>42.7</td><td>41.3</td></tr>
<tr><td>Max. sealing ring</td><td>21.2</td><td>18.9</td><td>17.3</td></tr>
<tr><td>Max. enclosure</td><td>40.9</td><td>39.2</td><td>37.6</td></tr>
<tr><td>Max. O ring</td><td>51.0</td><td>50.0</td><td>49.1</td></tr>
<tr><td>Max. wiring board(BMC)</td><td>37.7</td><td>36.5</td><td>34.9</td></tr>
<tr><td>Max.LED driving power</td><td>56.2</td><td>55.0</td><td>53.5</td></tr>
<tr><td>Max. cementing material(SY6002 polyurethane)</td><td>44.1</td><td>44.4</td><td>43.4</td></tr>
<tr><td>Entry point</td><td>17.8</td><td>16.3</td><td>15.7</td></tr>
<tr><td>Branching point</td><td>21.2</td><td>18.9</td><td>17.3</td></tr>
<tr><td>Test environmental temperature</td><td>12.2</td><td>12.2</td><td>11.1</td></tr>
<tr><td>Max. MCPCB LED</td><td>45.0</td><td>44.9</td><td>44.2</td></tr>
</table>
When the ambient temperature is 55℃, the correct temperature is in the following table.
<table>
<tr><th rowspan="2">Position</th><th colspan="3">Correct Temperature (℃)</th></tr>
<tr><th>vertically downward</th><th>downward 60°</th><th>downward 30°</th></tr>
<tr><td>Max. glass cover</td><td>87.4</td><td>85.5</td><td>85.2</td></tr>
<tr><td>Max. sealing ring</td><td>64.0</td><td>61.7</td><td>61.2</td></tr>
<tr><td>Max. enclosure</td><td>83.7</td><td>82.0</td><td>81.5</td></tr>
<tr><td>Max. O ring</td><td>93.8</td><td>92.8</td><td>93.0</td></tr>
<tr><td>Max. wiring board(BMC)</td><td>80.5</td><td>79.3</td><td>78.8</td></tr>
<tr><td>Max.LED driving power</td><td>99.0</td><td>97.8</td><td>97.4</td></tr>
<tr><td>Max. cementing material(SY6002 polyurethane)</td><td>86.9</td><td>87.2</td><td>87.3</td></tr>
<tr><td>Entry point</td><td>60.6</td><td>59.1</td><td>59.6</td></tr>
<tr><td>Branching point</td><td>64.0</td><td>61.7</td><td>61.2</td></tr>
<tr><td>Test environmental temperature</td><td>/</td><td>/</td><td>/</td></tr>
<tr><td>Max. MCPCB LED</td><td>87.8</td><td>87.7</td><td>88.1</td></tr>
</table>
1）The maximum surface temperature is 87.4℃,less than 100℃,complying with the temperature class assigned T5 for Group II and the maximum surface temperature assigned T95℃ for GroupⅢ
2) The service temperature of sealing ring is 64.0℃.
The service temperature of O ring is 93.8℃.
The service temperature of cementing material is 87.3℃.
The service temperature of wiring board is 80.5℃.
3) The maximum surface temperature of LED driving power is 99.0℃.</td><td>Pass</td></tr>
</table>

<table>
<tr><th colspan="4">IEC 60079-0</th></tr>
<tr><th>Clause</th><th>Requirement – Test</th><th>Result – Remark</th><th>Verdict</th></tr>
<tr><td>26.5.1.3</td><td>Maximum surface temperature</td><td>3.BZD130-Ⅰ（40W）
test voltage: 264VAC;
<table>
<tr><th rowspan="2">Position</th><th colspan="3">Test Temperature (℃)</th></tr>
<tr><th>vertically downward</th><th>downward 60°</th><th>downward 30°</th></tr>
<tr><td>Max. glass cover</td><td>36.5</td><td>33.5</td><td>33.5</td></tr>
<tr><td>Max. sealing ring</td><td>15.1</td><td>13.0</td><td>13.0</td></tr>
<tr><td>Max. enclosure</td><td>32.6</td><td>30.6</td><td>30.1</td></tr>
<tr><td>Max. O ring</td><td>38.3</td><td>37.6</td><td>37.7</td></tr>
<tr><td>Max. wiring board(BMC)</td><td>33.7</td><td>31.1</td><td>30.4</td></tr>
<tr><td>Max.LED driving power</td><td>57.4</td><td>55.9</td><td>55.1</td></tr>
<tr><td>Max. cementing material(SY6002 polyurethane)</td><td>38.3</td><td>37.3</td><td>37.4</td></tr>
<tr><td>Entry point</td><td>13.9</td><td>12.6</td><td>12.6</td></tr>
<tr><td>Branching point</td><td>15.1</td><td>13.0</td><td>13.0</td></tr>
<tr><td>Test environmental temperature</td><td>12.2</td><td>12.2</td><td>12.4</td></tr>
<tr><td>Max. MCPCB LED</td><td>42.1</td><td>41.2</td><td>41.1</td></tr>
</table>
When the ambient temperature is 55℃, the correct temperature is in the following table.
<table>
<tr><th rowspan="2">Position</th><th colspan="3">Correct Temperature (℃)</th></tr>
<tr><th>vertically downward</th><th>downward 60°</th><th>downward 30°</th></tr>
<tr><td>Max. glass cover</td><td>79.3</td><td>76.3</td><td>76.1</td></tr>
<tr><td>Max. sealing ring</td><td>57.9</td><td>55.8</td><td>55.6</td></tr>
<tr><td>Max. enclosure</td><td>75.4</td><td>73.4</td><td>72.7</td></tr>
<tr><td>Max. O ring</td><td>81.1</td><td>80.4</td><td>80.3</td></tr>
<tr><td>Max. wiring board(BMC)</td><td>76.5</td><td>73.9</td><td>73.0</td></tr>
<tr><td>Max.LED driving power</td><td>100.2</td><td>98.7</td><td>97.7</td></tr>
<tr><td>Max. cementing material(SY6002 polyurethane)</td><td>81.1</td><td>80.1</td><td>80.0</td></tr>
<tr><td>Entry point</td><td>56.7</td><td>55.4</td><td>55.2</td></tr>
<tr><td>Branching point</td><td>57.9</td><td>55.8</td><td>55.6</td></tr>
<tr><td>Test environmental temperature</td><td>/</td><td>/</td><td>/</td></tr>
<tr><td>Max. MCPCB LED</td><td>84.9</td><td>84.0</td><td>83.7</td></tr>
</table>
1）The maximum surface temperature is 79.3℃,less than 100℃,complying with the temperature class assigned T5 for Group II and the maximum surface temperature assigned T95℃ for GroupⅢ
2) The service temperature of sealing ring is 57.9℃.
The service temperature of O ring is 81.1℃.
The service temperature of cementing material is 81.1℃.
The service temperature of wiring board is 76.5℃.
3) The maximum surface temperature of LED driving power is 99.0℃.</td><td>Pass</td></tr>
</table>

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
26.5.2	Thermal shock test	After the measurement of maximum surface temperature, use a jet of water of about 1mm diameter at a temperature 10℃ to spray on the glass cover of BZD130-I with temperature 80.0℃, BZD130-II with temperature 88.0℃ and BZD130-III with temperature 93.0℃(under the environment temperature of 55℃). No breaking on the glass cover.	Pass
26.5.3	Small component ignition test (Group I and Group II)		
26.5.3.1	General	No small components.	N/A
26.5.3.2	Procedure	No small components.	N/A
26.5.3.3	Acceptance criteria	No small components.	N/A

26.6	Torque test for bushings		
26.6.1	Test procedure	1. Between cavity of light source and cavity of power supply, wires encapsulated by SY6002 polyurethane. The wires will not be subjected to a torque. 2. A torque of 2Nm was applied to the screw on the wiring board components respectively.	Pass
26.6.2	Acceptance criteria	Neither the stem in the bushing, nor the bushing itself, do not turn when the stem is subjected to a torque.	Pass

26.7	Non-metallic enclosures or non-metallic parts of enclosures		
26.7.1	General	Non-metallic parts of enclosure include sealing ring, encapsulation material, cementing material and gasket.	Pass
26.7.2	Test temperatures	For the upper temperature, 15K higher than the maximum service temperature. For the lower temperature, 10K lower than the minimum service temperature.	Pass

26.8	Thermal endurance to heat	Test sample(each specification two sample，altogether six sample,) tested is placed in the test chamber at the relative humidity 90%RH and at the temperature +95℃for 350 hours; then placed into the environmental chamber at the temperature 116°C for 350 hours. (115.8℃=93.8℃+20+ 2K).	Pass

26.9	Thermal endurance to cold	After the thermal endurance to heat, the sample is placed in at the relative humidity 50%RH and at the temperature +20℃ for 24 h, then immediately，the sample is stored at the environment with temperature at -50℃ for 24 hours.	Pass

26.10	Resistance to light		
26.10.1	Test procedure	The non-metallic materials are not exposed to light.	N/A
26.10.2	Acceptance criteria	The non-metallic materials are not exposed to light.	N/A

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
26.11	Resistance to chemical agents for Group I electrical equipment	Group II and group III equipment.	N/A
26.12	Earth continuity	The enclosure is made of metallic materials.	N/A
26.13	Surface resistance test of parts of parts of enclosures of non-metallic materials	The enclosure is made of metallic material and the spraying layer is less than 0.2mm. The surface area of 3M-PVC caution plate is less 2000mm^2.	N/A
26.14	Measurement of capacitance		
26.14.1	General	The enclosure is made of metallic materials.	N/A
26.14.2	Test procedure	The enclosure is made of metallic materials.	N/A
26.15	Verification of ratings of ventilating fans	No ventilating fans.	N/A
26.16	Alternative qualification of elastomeric sealing O-rings	O Sealing rings are installed on the entire samples for thermal endurance to heat and cold tests, then IP test.	Pass
27	Routine tests	The enclosure should be tested by static overpressure test with following test pressure within 10-60 seconds. type / the test pressure: Connection cavity: 1700 kPa Power supply cavity: 1500 kPa Light source cavity: 1200 kPa After water pressure test, there is no damage to enclosure or permanent deformation on joints that affecting the flameproof performance or no leakage through the enclosure wall.	Pass
28	Manufacturer's responsibility		
28.1	Conformity with the documentation	The manufacturer carried out the verification to ensure the BZD130 series explosion-proof LED Lightings conform the documentation.	Pass
28.2	Certificate	See manufacturer's document. The manufacturer has prepared a certificate confirming that the equipment is in conformity with the requirements of the standards IEC 60079-0:2011, IEC 60079-1:2014, IEC 60079-31:2013.	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
28.3	Responsibility for marking	The BZD130 series explosion-proof LED lightings are designed and manufactured, assessed and tested according to IEC 60079-0, IEC 60079-1 and IEC 60079-31. The sample complies with the documentation.	Pass
29	Marking		
29.1	Applicability	The nameplate complies with the requirements of IEC 60079-0, IEC 60079-1 and IEC 60079-31.	Pass
29.2	Location	On the visible position of the product. The nameplate is made of 3M-PVC and cemented on the enclosure.	Pass
29.3	General	See test report cover.	Pass
29.4	Ex marking for explosive gas atmospheres	Ex db IIC T5 Gb	Pass
29.5	Ex marking for explosive dust atmospheres	Ex tb IIIC T95℃ Db	Pass
29.6	Combined types (or levels) of protection	Not combined types of protection.	N/A
29.7	Multiple types of protection	Only one type of protection	N/A
29.8	Ga equipment using two independent Gb types (or levels) of protection	Gb equipment.	N/A
29.9	Ex Components	Not an Ex components.	N/A
29.10	Small equipment and small Ex Components	Not an Ex components.	N/A
29.11	Extremely small equipment and extremely small Ex Components	Not an extremely small equipment and extremely small Ex components	N/A

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
29.12	Warning markings	The BZD130 series explosion-proof LED lightings have warning words “WARNING – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT” “WARNING – DO NOT OPEN WHEN ENERGIZED” “WARNING – POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS”	Pass
29.13	Alternate marking of equipment protection levels (EPLs)	No alternate marking.	N/A
29.13.1	Alternate marking of type of protection for explosive gas atmospheres	No alternate marking.	N/A
29.13.2	Alternate marking of type of protection for explosive dust atmospheres	No alternate marking.	N/A
29.14	Cells and batteries	No cells and batteries.	N/A
29.15	Converter-fed electrical machines	No converter-fed electrical machines.	N/A
29.16	Examples of marking	Ex db ⅡC T5 Gb; Ex tb IIIC T95℃ Db	Pass
30	Instructions		
30.1	General	The instruction manual includes safety instructions, conformity with standards, field of application, model implication, main technical parameter, material and craft, installation and use age, maintenance and repair, spare parts, disposal recycling, dimensions and mounting methods.	Pass
30.2	Cells and batteries	No cells and batteries	Pass
30.3	Electrical machines	No electrical machines.	N/A
30.4	Ventilating fans	No ventilating fans.	N/A
Annex A (Normative)	Supplementary requirements for cable glands	A cable entry, M25×1.5.	Pass
A.1	General	The elastomer sealing rings (silicon rubber) are used between cable and the gland.	Pass
A.2	Constructional requirements		
A.2.1	Cable sealing	The elastomer sealing rings (silicon rubber) are used between cable and the gland.	Pass
A.2.2	Filling compounds	No filling compounds	N/A
A.2.3	Clamping		

<table>
<tr><td colspan="4">IEC 60079-0</td></tr>
<tr><td>Clause</td><td>Requirement – Test</td><td>Result – Remark</td><td>Verdict</td></tr>
<tr><td>A.2.3.1</td><td>General</td><td>The elastomer sealing rings (silicon rubber) are used to prevent pulling and twisting from the cable.
For the related tests, see clause A.3 in report IEC 60079-0.</td><td>Pass</td></tr>
<tr><td>A.2.3.2</td><td>Group II or III cable glands</td><td>User should provide additional clamping of the cable to ensure that pulling and twisting is not transmitted to the terminations.
Refer to A.3.1.1， the tensile force is 25% of the specified value, so the symbol “X” should be marked on certificate No, and user should provide additional clamping of the cable to ensure that pulling and twisting is not transmitted to the terminations.</td><td>Pass</td></tr>
<tr><td>A.2.4</td><td colspan="3">Lead-in of cable</td></tr>
<tr><td>A.2.4.1</td><td>Sharp edges</td><td>No sharp edge on sealing nut can damage the Cable, refer to drawing 8HRLM 940 1325.</td><td>N/A</td></tr>
<tr><td>A.2.4.2</td><td>Point of entry</td><td>For the unarmored cable gland, the entry point has a rounded edge at 90°, and the radius R=3mm, refer to drawing 8HRLM 940 1325.</td><td>Pass</td></tr>
<tr><td>A.2.5</td><td>Released by a tool</td><td>The cable gland can only be fixed by a wrench.</td><td>Pass</td></tr>
<tr><td>A.2.6</td><td>Fixing</td><td>The mechanical tests were carried out on the cable glands which were fixed with a proper enclosure. Refer to clause A.3.</td><td>Pass</td></tr>
<tr><td>A.2.7</td><td>Degree of protection</td><td>The degree of protection test(IP test) was carried out on the enclosure. Refer to clause 26.4.5.</td><td>Pass</td></tr>
<tr><td>A.3</td><td colspan="3">Type tests</td></tr>
<tr><td>A.3.1</td><td colspan="3">Tests of clamping of non-armoured and braided cables</td></tr>
<tr><td>A.3.1.1</td><td>Cable glands with clamping by the sealing ring</td><td>The complete cable gland and mandrel assemblies are subjected to the thermal endurance tests. See part IEC 60079-0 clauses 26.8 and 26.9.
Time of applying tensile force:6h
Test ambient temperature:21.0℃
Thread specification: M25×1.5,
Tensile force=20×diameter of mandrel or cable×25%.
<table>
<tr><td colspan="2">Sealing ring</td><td rowspan="2">Diameter of mandrel or cable</td><td rowspan="2">Applied torque(Nm)</td><td rowspan="2">Tensile force(N)</td><td rowspan="2">Slipage: ≤6mm(Y/N)</td></tr>
<tr><td>Smallest admissible cable size(mm)</td><td>Largest admissible cable size(mm)</td></tr>
<tr><td>10</td><td>10</td><td>10</td><td>28</td><td>50</td><td>Y</td></tr>
<tr><td>12</td><td>12</td><td>12</td><td>30</td><td>60</td><td>Y</td></tr>
<tr><td>14</td><td>14</td><td>14</td><td>32</td><td>70</td><td>Y</td></tr>
</table></td><td>Pass</td></tr>
<tr><td>A.3.1.2</td><td>Cable glands with clamping by filling compound</td><td>No filling compounds.</td><td>N/A</td></tr>
</table>

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
A.3.1.3	Cable gland with clamping by means of a clamping device	No clamping device	N/A
A.3.1.4	Tensile test	Refer to clause A.3.1.1 in report IEC60079-0	N/A
A.3.1.5	Mechanical strength	After tests in A.3.1.1, a torque was applied to the cable glands. Thread specification: M25×1.5; Torque applies on the nut(Nm):42,45,48 No deformation was found.	Pass
A.3.2	Tests of clamping of armoured cables		
A.3.2.1	Tests of clamping where the armourings are clamped by a device within the gland	No armoured cable	N/A
A.3.2.1.1	Tensile test	No armoured cable	N/A
A.3.2.1.2	Mechanical strength	No armoured cable	N/A
A.3.2.2	Tests of clamping where the armourings are not clamped by a device within the gland	No armoured cable	N/A
A.3.3	Type test for resistance to impact	Refer to clause 26.4.2 in this report.	N/A
A.3.4	Test for degree of protection (IP) of cable glands	The cable glands were tested with the enclosure. Refer to clause 26.4.5 in this report. The degree of protection of it is IP66	N/A
A.4	Marking		
A.4.1	Marking of cable glands	The thread specification is in the sign board (see 8HRLM 865 1072). For the related information, refer to the instruction. The cable gland is protected by ‘d’.	Pass
A.4.2	Marking of cable-sealing rings	The information of sealing ring is marked on the body of the sealing ring.	Pass

Annex B (Normative)	Requirements for Ex Components	N/A

Annex C (Informative)	Example of rig for resistance to impact test

Annex D (Informative)	Motors supplied by converters

Annex E (Informative)	Temperature rise testing of electric machines

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
Annex F (Informative)	Guideline flowchart for tests of non-metallic enclosures or non-metallic parts of enclosures (26.4)		

Measurement Section, including Additional Narrative Remarks (as deemed applicable)

IECEx TEST REPORT
IEC 60079-1
Explosive atmospheres – Part 1: Equipment protection by flameproof enclosures "d"

ExTR Reference Number ..... :	
ExTR Free Reference Number..... :	CMExC/ExTR17005G02
Compiled by + signature (ExTL).... :	Chen fandong
Reviewed by + signature (ExTL)... :	Liu yongming
Approved by + signature (ExTL).... :	Zhu shian
Date of issue..... :	

Ex Testing Laboratory (ExTL) ..... :	China National Quality Supervision &Test Center for Explosion-proof and Safety Products for Coal Mine (CMExC)
Address ..... :	No.11 Binhe Road Fushun Economic Development Area LiaoningP.R.China
Applicant's name ..... :	HRLM technology Incorporated Company
Address ..... :	No.15,West Henggang Street,Yangcheng Lake Town, Xiangcheng Disrict, Suzhou, Jiangsu, China
Standard ..... :	IEC 60079-1:2014, 7th Edition
Test procedure ..... :	IECEx System
Test Report Form Number..... :	ExTR60079-1_7A (released 2014-07)

Instructions for Intended Use of Ex Test Report:
An Ex Test Report provides a clause-by-clause documentation of the initial evaluation and testing that verified compliance of an item or product with an IEC Ex standard. This Ex Test Report is part of an ExTR package that may include other Ex Test Report, Addendum, National Differences and Partial Testing documents, along with a single ExTR Cover. An Ex Test Report is to be compiled and reviewed by the ExTL. The Issuing ExCB indicates final approval of the Ex Test Report as part of the overall ExTR package on the associated ExTR Cover.

Possible test case verdicts:

- test case does not apply to the test item..... : N / A
- test item does meet the requirement..... : Pass

General remarks:
The test results presented in this Ex Test Report relate only to the item or product tested.

- "(see Attachment #)" refers to additional information appended to this document.
- "(see appended table)" refers to a table appended to this document.
- Throughout this document, a point "." is used as the decimal separator.

The technical content of this Ex Test Report shall not be reproduced except in full without the written approval of the Issuing ExCB and ExTL.

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
1	Scope		
2	Normative references		
3	Terms and definitions		
4	Level of protection (equipment protection level, EPL)		
4.1	General	The EPL of is Gb.	Pass
4.2	Requirements for level of protection “da”	The EPL of the BZD130 series explosion-proof LED Lightings is Gb.	N / A
4.3	Requirements for level of protection “db”	The EPL of the BZD130 series explosion-proof LED Lightings is Gb.	Pass
4.4	Requirements for level of protection “dc”		
4.4.1	General	The EPL of the BZD130 series explosion-proof LED Lightings is Gb.	N / A
4.4.2	Construction of “dc” devices		
4.4.2.1	General	The EPL of the BZD130 series explosion-proof LED Lightings is Gb.	N / A
4.4.2.2	Free internal volume	The EPL of the BZD130 series explosion-proof LED Lightings is Gb.	N / A
4.4.2.3	Seal protection	The EPL of the BZD130 series explosion-proof LED Lightings is Gb.	N / A
4.4.2.4	Continuous operating temperature (COT) requirements	The EPL of the BZD130 series explosion-proof LED Lightings is Gb.	N / A
4.4.2.5	Ratings	The EPL of the BZD130 series explosion-proof LED Lightings is Gb.	N / A
4.4.3	Tests for “dc” devices	The EPL of the BZD130 series explosion-proof LED Lightings is Gb.	N / A

<table>
<tr><th colspan="4">IEC 60079-1</th></tr>
<tr><th>Clause</th><th>Requirement – Test</th><th>Result – Remark</th><th>Verdict</th></tr>
<tr><td>5</td><td colspan="3">Flameproof joints</td></tr>
<tr><td>5.1</td><td>General requirements</td><td>The joints of The BZD130 series explosion-proof LED Lightings comply with requirements of Clause 5 and are smeared with 204-1 grease. Refer to material quality report of 204-1.</td><td>Pass</td></tr>
<tr><td>5.2</td><td colspan="3">Non-threaded joints</td></tr>
<tr><td>5.2.1</td><td>Width of joints (L)</td><td>The width of joints, refer to the following sheet
For the BZD130-Ⅲ（120W/100W）
Connection cavity:100 cm^3 ;
Power supply cavity: 889cm^3 ;
Light source cavity: 1032 cm^3
The joints between Enclosure and Cover is Cylindrical joints.
R: required value; D:design value; M: measured value; unit: mm
<table>
<tr><th>Type</th><th>Part</th><th>L(R)</th><th>L(D)</th><th>L(M)</th></tr>
<tr><td>Connection cavity</td><td>Wiring sleeve and Joint sleeve_BZD130-Ⅱ</td><td>9.5</td><td>10.5</td><td>10.5</td></tr>
<tr><td>Power supply cavity</td><td>Joint sleeve_BZD130-Ⅱ and cavity of power supply_BZD130-Ⅱ</td><td>12.5</td><td>13.5</td><td>13.5</td></tr>
<tr><td>Light source cavity</td><td>cavity of light source_BZD-Ⅲ and enclosure ring_BZD130-Ⅲ</td><td>12.5</td><td>16.0</td><td>16.0</td></tr>
</table></td><td>Pass</td></tr>
</table>

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
5.2.1	Width of joints (*L*)	The width of joints, refer to the following sheet For the BZD130-Ⅱ（50W/60W/80W） Connection cavity:100 cm^3 ; Power supply cavity: 889cm^3 ; Od light source cavity: 452 cm^3 The joints between Enclosure and Cover is Cylindrical joints. R: required value; D:design value; M: measured value; unit: mm	Pass

Type	Part	L(R)	L(D)	L(M)
Connection cavity	Wiring sleeve and Joint sleeve_BZD130-Ⅱ	9.5	10.5	10.5
Power supply cavity	Joint sleeve_BZD130-Ⅱ and cavity of power supply_BZD130-Ⅱ	12.5	13.5	13.5
Light source cavity	cavity of light source_BZD-Ⅱ and enclosure ring_BZD130-Ⅱ	9.5	12.5	12.5

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
5.2.1	Width of joints (*L*)	The width of joints, refer to the following sheet For the BZD130-Ⅰ（20W/30W/40W） Connection cavity:100 cm^3 ; Power supply cavity: 227cm^3 ; Od light source cavity: 227cm^3 The joints between Enclosure and Cover is Cylindrical joints. R: required value; D:design value; M: measured value; unit: mm	Pass

Type	Part	L(R)	L(D)	L(M)
Connection cavity	Wiring sleeve and Joint sleeve_BZD130-Ⅰ	9.5	10.5	10.5
Power supply cavity	Joint sleeve_BZD130-Ⅰ and cavity of power supply_BZD130-Ⅰ	9.5	14.0	14.0
Light source cavity	cavity of light source_BZD-Ⅰ and enclosure ring_BZD130-Ⅰ	9.5	10.3	10.3

<table>
<tr><th colspan="4">IEC 60079-1</th></tr>
<tr><th>Clause</th><th>Requirement – Test</th><th>Result – Remark</th><th>Verdict</th></tr>
<tr><td>5.2.2</td><td>Gap (i)</td><td>The joint between shell and cover is Cylindrical joints. Average roughness Ra is 3.2μ m.
For the BZD130-Ⅲ（120W/100W）
R: required value; D:design value; M: measured value
<table>
<tr><th>Type</th><th>Part</th><th>i(R)</th><th>i(D)</th><th>i(M)</th></tr>
<tr><td>Connection cavity</td><td>Wiring sleeve and Joint sleeve_BZD130-Ⅱ</td><td>0.10 mm</td><td>0.10mm</td><td>0.10 mm</td></tr>
<tr><td>Power supply cavity</td><td>Joint sleeve_BZD130-Ⅱ and cavity of power supply_BZD130-Ⅱ</td><td>0.15 mm</td><td>0.14mm</td><td>0.14 mm</td></tr>
<tr><td>Light source cavity</td><td>cavity of light source_BZD-Ⅲ and enclosure ring_BZD130-Ⅲ</td><td>0.15 mm</td><td>0.15mm</td><td>0.15 mm</td></tr>
</table>
For the BZD130-Ⅱ（50W/60W/80W）
<table>
<tr><th>Type</th><th>Part</th><th>i(R)</th><th>i(D)</th><th>i(M)</th></tr>
<tr><td>Connection cavity</td><td>Wiring sleeve and Joint sleeve_BZD130-Ⅱ</td><td>0.10 mm</td><td>0.10 mm</td><td>0.10 mm</td></tr>
<tr><td>Power supply cavity</td><td>Joint sleeve_BZD130-Ⅱ and cavity of power supply_BZD130-Ⅱ</td><td>0.15 mm</td><td>0.14 mm</td><td>0.14 mm</td></tr>
<tr><td>Od light source cavity</td><td>cavity of light source_BZD-Ⅱ and enclosure ring_BZD130-Ⅱ</td><td>0.10 mm</td><td>0.10 mm</td><td>0.10 mm</td></tr>
</table></td><td>Pass</td></tr>
</table>

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
5.2.2	Gap (*i)*	For the BZD130-Ⅰ（20W/30W/40W） R: required value; D:design value; M: measured value	Pass

Type	Part	i(R)	i(D)	i(M)
Connection cavity	Wiring sleeve and Joint sleeve_BZD130-Ⅰ	0.10 mm	0.10mm	0.10 mm
Power supply cavity	Joint sleeve_BZD130-Ⅰ and cavity of power supply_ BZD130-Ⅰ	0.10 mm	0.10mm	0.10 mm
Light source cavity	cavity of light source_BZD-Ⅰ and enclosure ring_BZD 130-Ⅰ	0.10 mm	0.10mm	0.10 mm

5.2.3	Spigot joints	No spigot joints	N / A
5.2.4	Holes in joint surfaces		
5.2.4.1	General	No holes in joint surfaces	N / A
5.2.4.2	Flanged joints with holes outside the enclosure (see Figures 3 and 5)	No holes in joint surfaces	N / A
5.2.4.3	Flanged joints with holes inside the enclosure (see Figure 4)	No holes in joint surfaces	N / A
5.2.4.4	Spigot joints where, to the edges of the holes, the joint consists of a cylindrical part and a plane part (see Figure 6)	No holes in joint surfaces	N / A
5.2.4.5	Spigot joints where, to the edges of the holes, the joint consists only of the plane part (see Figures 7 and 8), in so far as plane joints are permitted (see 5.2.7)	No holes in joint surfaces	N / A
5.2.5	Conical joints	No conical joints	N / A
5.2.6	Joints with partial cylindrical surfaces (not permitted for Group IIC)	No Joints with partial cylindrical surfaces.	N / A

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
5.2.7	Flanged joints for acetylene atmospheres	No Flanged joints	N / A
5.2.8	Serrated joints	No serrated joints.	N / A
5.2.9	Multi-step joints	No multi-step joints.	N / A
5.3	Threaded joints	Metric thread complies with the requirements of fit tolerance 6H of standard ISO 956-3. Minimum full thread number (R) is 5, The Minimum length of engagement(R) is 8mm. The number of full thread engagement are as follows: volume of connection cavity: 100cm^3 Joint between enclosure and gland nut is threaded joint (M25×1.5-6H/6g, refer to 8HRLM 354 1043 and 8HRLM 940 1325), minimum 6 full threads engaged, thread pitch 1.5mm. Minimum engagement length 9.0mm. Note: Cylindrical threaded conform with ISO 965-1 and ISO 965-3.	Pass
5.4	Gaskets (including O-rings)	O-rings do not interrupt the flameproof joint, refer to 2HRLM 511 1118.1, 2HRLM 511 1118.2 and 2HRLM 511 1118.3.	Pass
5.5	Equipment using capillaries	No capillaries.	N / A
6	Sealed joint		
6.1	Cemented joints		

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
6.1.1	General	Refer to 2HRLM 511 1118.1, 2HRLM 511 1118.2 and 2HRLM 511 1118.3, the cemented joints between joint sleeve and wiring board is cemented by SY6002 polyurethane. The cemented joints between pulg (M16×1.5) and cavity of power supply is cemented by SY6002 polyurethane. The cemented joints between enclosure and glass cover is cemented by SY6002 polyurethane. The cemented joints between cavity of power supply and cavity of light source is encapsulated by SY6002 polyurethane.The COT of SY6002 polyurethane is -50℃～+220℃, more information see document of Material quality report of SY6002. The cemented joints were submitted to thermal endurance tests. Refer to Cl. 26.8 and Cl. 26.9 in test report IEC 60079-0.	Pass
6.1.2	Mechanical strength	1. Mechanical strength of the cemented joints between joint sleeve and wiring board depends on threaded joint (M42×1.5), refer to the drawing 5HRLM 064 1021. 2.Mechanical strength of the cemented joints between pulg (M16×1.5) and cavity of power supply, and between cavity of power supply and cavity of light source, depends on the blot(3-M6) , refer to the drawing 2HRLM 511 1118.1, 2HRLM 511 1118.2 and 2HRLM 511 1118.3. 3. Mechanical strength of the cemented joints between enclosure and glass cover depends on clamp plate, refer to the drawing 2HRLM 511 1118.1, 2HRLM 511 1118.2 and 2HRLM 511 1118.3. 4 .Pressure test see part IEC 60079-1 clause 15.2.3	Pass
6.1.3	Width of cemented joints	Refer to the assembly drawing 2HRLM 511 1118.1, 2HRLM 511 1118.2 and 2HRLM 511 1118.3, the net volume of cavities is equal to or bigger than100cm^3,and the cemented path is equal to or bigger than10mm.	Pass
6.2	Fused glass joints		
6.2.1	General	No fused glass joints.	N / A
6.2.2	Width of fused glass joints	No fused glass joints.	N / A
7	Operating rods	No operating rods.	N / A
8	Supplementary requirements for shafts and bearings		

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
8.1	Joints of shafts		
8.1.1	General	No joints of shaft	N / A
8.1.2	Cylindrical joints	No cylindrical joint	N / A
8.1.3	Labyrinth joints	No labyrinth joints.	N / A
8.1.4	Joints with floating glands	No joints with floating glands.	N / A
8.2	Bearings		
8.2.1	Sleeve Bearings	No bearings.	N / A
8.2.2	Rolling-element bearings	No bearings.	N / A
9	Light-transmitting parts	Refer to the assembly drawing 2HRLM 511 1118.1, 2HRLM 511 1118.2 and 2HRLM 511 1118.3, the light-transmitting parts is toughened well glass. The toughened well glass is test for resistance to impact and thermal shock test, see Cl.26.4.2 and Cl.26.5.2 in test report IEC 60079-0.	Pass
10	Breathing and draining devices which form part of a flameproof enclosure		
10.1	General	No breathing or draining device.	N / A
10.2	Openings for breathing or draining	No breathing or draining device.	N / A
10.3	Composition limits	No breathing or draining device.	N / A
10.4	Dimensions	No breathing or draining device.	N / A
10.5	Elements with measurable paths	No breathing or draining device.	N / A
10.6	Elements with non-measurable paths	No breathing or draining device.	N / A
10.7	Removable devices		
10.7.1	General	No breathing or draining device.	N / A
10.7.2	Mounting arrangements of the elements	No breathing or draining device.	N / A

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
10.8	Mechanical strength	No breathing or draining device.	N / A
10.9	Breathing devices and draining devices when used as Ex components		
10.9.1	General	No breathing or draining device.	N / A
10.9.2	Mounting arrangements of the elements and components	No breathing or draining device.	N / A
10.9.3	Type tests for breathing and draining devices used as Ex components		
10.9.3.1	General	No breathing or draining device.	N / A
10.9.3.2	Thermal tests		
10.9.3.2.1	General	No breathing or draining device.	N / A
10.9.3.2.2	Test procedure	No breathing or draining device.	N / A
10.9.3.2.3	Acceptance criteria	No breathing or draining device.	N / A
10.9.3.3	Test for non-transmission of an internal ignition		
10.9.3.3.1	General	No breathing or draining device.	N / A
10.9.3.3.2	Test procedure	No breathing or draining device.	N / A
10.9.3.3.3	Acceptance criteria	No breathing or draining device.	N / A
10.9.3.4	Test of the ability of the breathing and draining device to withstand pressure		
10.9.3.4.1	Test procedure	No breathing or draining device.	N / A
10.9.3.4.2	Acceptance criteria	No breathing or draining device.	N / A
10.9.4	Ex component certificate	No breathing or draining device.	N / A
11	Fasteners and openings		
11.1	Type of fastener	See this test report IEC 60079-0 clauses 9.1 and 9.2. M6 the hexagon socket head cap screws are special fasteners complying with the requirements of Clause 9.1 and 9.2 of IEC60079-0.	Pass
11.2	Plastic material or light alloys	No Plastic material or light alloys	N/A
11.3	Yield stress	The property class of the M6 screws is A2-70. The warning words “CAUTION-USE FASTENER WITH YIELD STRESS≥ 450 MPa” are located in the nameplate.	Pass
11.4	Studs	No studs.	N / A
11.5	Fasteners through walls	No fasteners through walls.	N / A

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
11.6	Blind holes	The thickness of bottom of mounting thread hole is no less than 3mm, refer to the assembly drawing 2HRLM 511 1118.1, 2HRLM 511 1118.2 and 2HRLM 511 1118.3.	Pass
11.7	Screws into blind holes	When screws are fully tightened into blind holes in enclosure walls, with no washer fitted. More than one full thread is remained free at the base of the hole.	Pass
11.8	Closing of through holes	No through holes.	N / A
11.9	Separate fastening arrangements for threaded doors/covers	No threaded doors/covers	N/A
12	Materials		
12.1	Tests prescribed by Clauses 14 to 16	Refer to clauses 14 to 16.	Pass
12.2	Assembly of multiple flameproof enclosures	See drawing 2HRLM 511 1118.1, 2HRLM 511 1118.2 and 2HRLM 511 1118.3, the BZD130 series explosion-proof LED Lightings includes three flameproof compartments, connection cavity, power supply cavity and light source cavity， and is segregated by bushing.	Pass
12.3	Intercommunicating enclosure compartments	No intercommunicating enclosure compartments	N / A
12.4	Use of cast iron	No use of cast iron.	N / A
12.5	Use of liquids	No use of liquids.	N / A
12.6	Insulating materials for Group I apparatus	No Group I	N / A
12.7	Zinc content	Refer to material quality report of ADC12, the zinc content of enclosure is 0.79%.	Pass

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
12.8	Copper or copper alloys in explosive gas atmospheres containing acetylene	Refer to material quality report of H59, the copper content of enclosure is 57.85%.	Pass
13	Entries for flameproof enclosures		
13.1	General	Cable gland and enclosure are as a whole. The user's manual specifies that the entries of enclosure are permanent and the exterior's parameters to proper selection of cable gland. Internal metric threads with a tolerance class of 6H according to ISO 965-1 and ISO 965-3.	Pass
13.2	Threaded holes	The thread specification is M25×1.5, which complies with the requirements marked on the drawings and instruction manual.	Pass
13.3	Non-threaded holes (for Group I only)	No Group I	N / A
13.4	Cable glands	See drawing 2HRLM 511 1118.1, 2HRLM 511 1118.2 and 2HRLM 511 1118.3,cable glands form an integral part with the equipment.	Pass
13.5	Conduit sealing devices		
13.5.1	Conduit sealing devices, whether integral or separate,	No conduit sealing device.	N / A
13.5.2	Permitted for Group II only	No conduit sealing device.	N / A
13.5.3	Sealing device such as a stopping box with setting compound	No conduit sealing device.	N / A
13.6	Plugs and sockets and cable couplers		
13.6.1	Construction & mounting	The socket is installed inside the terminal cavity as a component. And the socket is used when the battery is charged in safety area. It does not affect the Ex performance.	N / A
13.6.2	Flameproof joints of contact parts	The socket is installed inside the terminal cavity as a component. And the socket is used when the battery is charged in safety area. It does not affect the Ex performance.	N / A
13.6.3	Flameproof properties in the event of internal explosion	The socket is installed inside the terminal cavity as a component. And the socket is used when the battery is charged in safety area. It does not affect the Ex performance.	N / A

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
13.6.4	Not connected to an interlocking switch	The socket is installed inside the terminal cavity as a component. And the socket is used when the battery is charged in safety area. It does not affect the Ex performance.	N / A
13.6.5	Exemption & warning label	The socket is installed inside the terminal cavity as a component. And the socket is used when the battery is charged in safety area. It does not affect the Ex performance.	N / A
13.7	Bushings	Wires board is cemented by SY6002 polyurethane，which cemented length is greater than10mm . The cemented joints between cavity of power supply and cavity of light source is encapsulated by SY6002 polyurethane, which cemented length is greater than 20mm , cross section area of the setting compound is more than 20%, and is integral with the enclosure and were tested as part of the enclosure. For the length of the compound and test, see clause 6.1.3 and annex C2.1.4.	Pass
13.8	Blanking elements	No blanking elements.	N / A
14	Verification and tests	The maximum surface temperature was measured in the condition of the 110% rated voltage. See this test report IEC 60079-0 clause 26.5.1.3.	Pass
15	Type tests		
15.1	General	Carry out test on sample which has been subjected to the tests of enclosures in accordance with IEC 60079-0. Samples were tested according to the following sequence: 1.reference pressure measurement, 2.overpressure test, 3.test for non-transmission of an internal ignition. The sample information refer to cover.	Pass
15.2	Tests of ability of the enclosure to withstand pressure		

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
15.2.1	General	The cementing material with sample has been tested in thermal endurance to heat and thermal endurance to cold When test of ability of the enclosure to withstand pressure is going on, the gasket is not removed. Tests of ability of the enclosure to withstand pressure are carried out according to Cl.15.2.2. After the tests, no permanent damage or deformation has been found.	Pass
15.2.2	Determination of explosion pressure (reference pressure)		
15.2.2.1	General	For service ambient temperature: -40℃ to +55℃, the reference pressure are determined at normal ambient temperature using the defined test mixtures by increasing pressure. P=293/(-40+273)=1.257kPa	Pass

<table>
<tr><th colspan="4">IEC 60079-1</th></tr>
<tr><th>Clause</th><th>Requirement – Test</th><th>Result – Remark</th><th>Verdict</th></tr>
<tr><td>15.2.2.2</td><td>Test procedure</td><td>The absolute pressure of the test is 1.01×10^5Pa. The Initial pressure is 26kPa(1.257-1.01=0.247kPa).
The explosive gas mixture used in test were (14 ± 1) % acetylene and (31 ± 1) % hydrogen in volume. Test five times for gas mixture. The maximum explosion pressure are as follows:
For: the BZD130-Ⅰ(40W)
<table>
<tr><th>Type</th><th>the maximum pressure</th><th>acetylene（v%）</th></tr>
<tr><td>Connection cavity</td><td>1043 kPa</td><td>14.35</td></tr>
<tr><td>Power supply cavity</td><td>942 kPa</td><td>13.78</td></tr>
<tr><td>light source cavity</td><td>788 kPa</td><td>13.20</td></tr>
</table>
<table>
<tr><th>Type</th><th>the maximum pressure</th><th>hydrogen（v%）</th></tr>
<tr><td>Connection cavity</td><td>758 kPa</td><td>31.33</td></tr>
<tr><td>Power supply cavity</td><td>686 kPa</td><td>31.48</td></tr>
<tr><td>light source cavity</td><td>613 kPa</td><td>30.33</td></tr>
</table>
For: the BZD130-Ⅱ(80W)
<table>
<tr><th>Type</th><th>the maximum pressure</th><th>acetylene（v%）</th></tr>
<tr><td>Connection cavity</td><td>1070 kPa</td><td>14.26</td></tr>
<tr><td>Power supply cavity</td><td>958 kPa</td><td>14.26</td></tr>
<tr><td>light source cavity</td><td>797 kPa</td><td>14.16</td></tr>
</table>
<table>
<tr><th>type</th><th>the maximum pressure</th><th>hydrogen（v%）</th></tr>
<tr><td>Connection cavity</td><td>752 kPa</td><td>31.24</td></tr>
<tr><td>Power supply cavity</td><td>664 kPa</td><td>30.86</td></tr>
<tr><td>light source cavity</td><td>606 kPa</td><td>31.19</td></tr>
</table></td><td>Pass</td></tr>
</table>

<table>
<tr><th colspan="4">IEC 60079-1</th></tr>
<tr><th>Clause</th><th>Requirement – Test</th><th>Result – Remark</th><th>Verdict</th></tr>
<tr><td>15.2.2.2</td><td>Test procedure</td><td>For: the BZD130-Ⅲ(120W)
<table>
<tr><th>type</th><th>the maximum pressure</th><th>acetylene（v%）</th></tr>
<tr><td>Connection cavity</td><td>1070 kPa</td><td>14.26</td></tr>
<tr><td>Power supply cavity</td><td>958 kPa</td><td>14.26</td></tr>
<tr><td>light source cavity</td><td>785 kPa</td><td>13.68</td></tr>
</table>
<table>
<tr><th>type</th><th>the maximum pressure</th><th>hydrogen（v%）</th></tr>
<tr><td>Connection cavity</td><td>752 kPa</td><td>31.24</td></tr>
<tr><td>Power supply cavity</td><td>664 kPa</td><td>30.86</td></tr>
<tr><td>light source cavity</td><td>662 kPa</td><td>30.86</td></tr>
</table></td><td>Pass</td></tr>
<tr><td>15.2.2.3</td><td>Rotating electrical machines</td><td>No Rotating electrical machines</td><td>N / A</td></tr>
<tr><td>15.2.2.4</td><td>Pressure-piling</td><td>No Pressure-piling</td><td>N / A</td></tr>
<tr><td>15.2.2.5</td><td>Apparatus intended for use in a single gas</td><td>No apparatus intended for use in a single gas</td><td>N / A</td></tr>
<tr><td>15.2.3</td><td colspan="3">Overpressure test</td></tr>
<tr><td>15.2.3.1</td><td>General</td><td>First method (static) was used.</td><td>Pass</td></tr>
<tr><td>15.2.3.2</td><td>Overpressure test - First method (static)</td><td>Pressure applied for each type of the BZD130 series explosion-proof LED Lightings is
as follows :
<table>
<tr><th>Type</th><th>the test pressure</th></tr>
<tr><td>Connection cavity</td><td>1700 kPa</td></tr>
<tr><td>Power supply cavity</td><td>1500 kPa</td></tr>
<tr><td>light source cavity</td><td>1200 kPa</td></tr>
</table>
Test duration: 10s.
No damage to the enclosure affecting the explosion-proof performance has been found after the tests.</td><td>Pass</td></tr>
<tr><td>15.2.3.3</td><td>Overpressure test - Second method (dynamic)</td><td>First method</td><td>N / A</td></tr>
<tr><td>15.3</td><td colspan="3">Test for non-transmission of an internal ignition</td></tr>
</table>

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
15.3.1	General	When we do the test, the sample was carried out according toCl.15.3.1. The cementing material with sample has been tested in thermal endurance to heat and thermal endurance to cold When test for non-transmission of an internal ignition is going on, the gasket is removed. The BZD130 series explosion-proof LED Lightings is not intended for use at an ambient temperature above 60°C.	Pass
15.3.2	Electrical equipment of groups I, IIA and IIB		
15.3.2.1	Test gap and test gas	Group IIC	N/A
15.3.2.1	Test gap and test gas	Group IIC	N/A
15.3.2.2	Increasing of gaps for test	Group IIC	N/A
15.3.2.3	Number of tests and acceptance criterion	Group IIC	N/A
15.3.3	Electrical apparatus of group IIC		
15.3.3.1	General	Second method	Pass
15.3.3.2	First method – Testing by increased test gap	Second method	N / A

<table>
<tr><th colspan="4">IEC 60079-1</th></tr>
<tr><th>Clause</th><th>Requirement – Test</th><th>Result – Remark</th><th>Verdict</th></tr>
<tr><td>15.3.3.3</td><td>Second method – Testing by increased pressure</td><td>
See Cl.5.2.2 in this test report of IEC60079-1，the i_E is equal to i（M）.
The absolute pressure of the test is 1.01×10^5Pa.
For the BZD130-Ⅰ(40W)：
Connection cavity is done test as following,
<table>
<tr><th rowspan="2">Test No</th><th rowspan="2">gas</th><th colspan="2">Concentration (V%)</th><th rowspan="2">Initial pressure (kPa)</th></tr>
<tr><th>inside</th><th>outside</th></tr>
<tr><td>1</td><td>H_2</td><td>27.85</td><td>27.85</td><td>50</td></tr>
<tr><td>2</td><td>H_2</td><td>27.56</td><td>27.56</td><td>50</td></tr>
<tr><td>3</td><td>H_2</td><td>26.94</td><td>26.94</td><td>50</td></tr>
<tr><td>4</td><td>H_2</td><td>26.41</td><td>26.41</td><td>50</td></tr>
<tr><td>5</td><td>H_2</td><td>26.79</td><td>26.79</td><td>50</td></tr>
<tr><td>6</td><td>C_2H_2</td><td>8.04</td><td>8.04</td><td>50</td></tr>
<tr><td>7</td><td>C_2H_2</td><td>7.89</td><td>7.89</td><td>50</td></tr>
<tr><td>8</td><td>C_2H_2</td><td>7.46</td><td>7.46</td><td>50</td></tr>
<tr><td>9</td><td>C_2H_2</td><td>7.13</td><td>7.13</td><td>50</td></tr>
<tr><td>10</td><td>C_2H_2</td><td>7.27</td><td>7.27</td><td>50</td></tr>
</table>
Power supply cavity is done test as following,
<table>
<tr><th rowspan="2">Test No</th><th rowspan="2">gas</th><th colspan="2">Concentration (V%)</th><th rowspan="2">Initial pressure (kPa)</th></tr>
<tr><th>inside</th><th>outside</th></tr>
<tr><td>1</td><td>H_2</td><td>28.70</td><td>28.70</td><td>50</td></tr>
<tr><td>2</td><td>H_2</td><td>27.13</td><td>27.13</td><td>50</td></tr>
<tr><td>3</td><td>H_2</td><td>27.56</td><td>27.56</td><td>50</td></tr>
<tr><td>4</td><td>H_2</td><td>26.99</td><td>26.99</td><td>50</td></tr>
<tr><td>5</td><td>H_2</td><td>26.70</td><td>26.70</td><td>50</td></tr>
<tr><td>6</td><td>C_2H_2</td><td>7.46</td><td>7.46</td><td>50</td></tr>
<tr><td>7</td><td>C_2H_2</td><td>7.37</td><td>7.37</td><td>50</td></tr>
<tr><td>8</td><td>C_2H_2</td><td>7.94</td><td>7.94</td><td>50</td></tr>
<tr><td>9</td><td>C_2H_2</td><td>7.75</td><td>7.75</td><td>50</td></tr>
<tr><td>10</td><td>C_2H_2</td><td>7.03</td><td>7.03</td><td>50</td></tr>
</table>
light source cavity is done test as following,
<table>
<tr><th rowspan="2">Test No</th><th rowspan="2">gas</th><th colspan="2">Concentration (V%)</th><th rowspan="2">Initial pressure (kPa)</th></tr>
<tr><th>inside</th><th>outside</th></tr>
<tr><td>1</td><td>H_2</td><td>27.13</td><td>27.13</td><td>50</td></tr>
<tr><td>2</td><td>H_2</td><td>26.60</td><td>26.60</td><td>50</td></tr>
<tr><td>3</td><td>H_2</td><td>26.89</td><td>26.89</td><td>50</td></tr>
<tr><td>4</td><td>H_2</td><td>27.32</td><td>27.32</td><td>50</td></tr>
<tr><td>5</td><td>H_2</td><td>27.42</td><td>27.42</td><td>50</td></tr>
<tr><td>6</td><td>C_2H_2</td><td>6.84</td><td>6.84</td><td>50</td></tr>
<tr><td>7</td><td>C_2H_2</td><td>7.13</td><td>7.13</td><td>50</td></tr>
<tr><td>8</td><td>C_2H_2</td><td>7.46</td><td>7.46</td><td>50</td></tr>
<tr><td>9</td><td>C_2H_2</td><td>7.22</td><td>7.22</td><td>50</td></tr>
<tr><td>10</td><td>C_2H_2</td><td>6.94</td><td>6.94</td><td>50</td></tr>
</table>
Test result: the explosion is appeared in the interior chamber, and no explosion in the outside chamber.
</td><td>Pass</td></tr>
</table>

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**

15.3.3.3 — Second method – Testing by increased pressure — Pass

See Cl.5.2.2 in this test report of IEC60079-1，the i_E is equal to i（M）.

The absolute pressure of the test is 1.01×10^5Pa.

For the BZD130-Ⅱ(80W)：

Connection cavity is done test as following,

Test No	gas	Concentration (V%)		Initial pressure (kPa)
		inside	outside	
1	H_2	27.85	27.85	50
2	H_2	27.56	27.56	50
3	H_2	26.94	26.94	50
4	H_2	26.41	26.41	50
5	H_2	26.79	26.79	50
6	C_2H_2	8.04	8.04	50
7	C_2H_2	7.89	7.89	50
8	C_2H_2	7.46	7.46	50
9	C_2H_2	7.13	7.13	50
10	C_2H_2	7.27	7.27	50

Power supply cavity is done test as following,

Test No	gas	Concentration (V%)		Initial pressure (kPa)
		inside	outside	
1	H_2	28.70	28.70	50
2	H_2	27.13	27.13	50
3	H_2	27.56	27.56	50
4	H_2	26.99	26.99	50
5	H_2	36.94	36.94	50
6	C_2H_2	7.46	7.46	50
7	C_2H_2	7.37	7.37	50
8	C_2H_2	7.94	7.94	50
9	C_2H_2	7.75	7.75	50
10	C_2H_2	7.03	7.03	50

light source cavity is done test as following,

Test No	gas	Concentration (V%)		Initial pressure (kPa)
		inside	outside	
1	H_2	26.75	26.75	50
2	H_2	26.98	26.98	50
3	H_2	26.50	26.50	50
4	H_2	26.89	26.89	50
5	H_2	27.42	27.42	50
6	C_2H_2	7.27	7.27	50
7	C_2H_2	7.08	7.08	50
8	C_2H_2	7.46	7.46	50
9	C_2H_2	7.51	7.51	50
10	C_2H_2	7.70	7.70	50

Test result: the explosion is appeared in the interior chamber, and no explosion in the outside chamber.

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**

15.3.3.3 — Second method – Testing by increased pressure — Pass

See Cl.5.2.2 in this test report of IEC60079-1, the i_E is equal to i（M）.

The absolute pressure of the test is 1.01×10^5Pa.

For the BZD130-Ⅲ(120W)：

Connection cavity is done test as following,

Test No	gas	Concentration (V%)		Initial pressure (kPa)
		inside	outside	
1	H_2	27.85	27.85	50
2	H_2	27.56	27.56	50
3	H_2	26.94	26.94	50
4	H_2	26.41	26.41	50
5	H_2	26.79	26.79	50
6	C_2H_2	8.04	8.04	50
7	C_2H_2	7.89	7.89	50
8	C_2H_2	7.46	7.46	50
9	C_2H_2	7.13	7.13	50
10	C_2H_2	7.27	7.27	50

Power supply cavity is done test as following,

Test No	gas	Concentration (V%)		Initial pressure (kPa)
		inside	outside	
1	H_2	28.70	28.70	50
2	H_2	27.13	27.13	50
3	H_2	27.56	27.56	50
4	H_2	26.99	26.99	50
5	H_2	36.94	36.94	50
6	C_2H_2	7.46	7.46	50
7	C_2H_2	7.37	7.37	50
8	C_2H_2	7.94	7.94	50
9	C_2H_2	7.75	7.75	50
10	C_2H_2	7.03	7.03	50

light source cavity is done test as following,

Test No	gas	Concentration (V%)		Initial pressure (kPa)
		inside	outside	
1	H_2	27.13	27.13	50
2	H_2	26.60	26.60	50
3	H_2	26.89	26.89	50
4	H_2	27.32	27.32	50
5	H_2	27.42	27.42	50
6	C_2H_2	6.84	6.84	50
7	C_2H_2	7.13	7.13	50
8	C_2H_2	7.46	7.46	50
9	C_2H_2	7.22	7.22	50
10	C_2H_2	6.94	6.94	50

Test result: the explosion is appeared in the interior chamber, and no explosion in the outside chamber.

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
15.3.3.4	Third method – Testing by oxygen enrichment of test gases	Second method	N/A
15.3.3.5	Number of tests for single piece production	No single piece production	N/A
15.4	Tests of flameproof enclosures with breathing and draining devices		
15.4.1	General	No breathing and draining devices.	N / A
15.4.2	Tests of ability of the enclosure to withstand pressure		
15.4.2.1	General	No breathing and draining devices.	N / A
15.4.2.2	Replacement of breathing and draining devices	No breathing and draining devices.	N / A
15.4.2.3	Overpressure test	No breathing and draining devices.	N / A
15.4.3	Thermal tests		
15.4.3.1	Test procedure	No breathing and draining devi ces.	N / A
15.4.3.2	Acceptance criterion	No breathing and draining devices.	N / A
15.4.4	Tests for non-transmission of an internal ignition		
15.4.4.1	General	No breathing and draining devices.	N / A
15.4.4.2	Test procedure	No breathing and draining devices.	N / A
15.4.4.3	Non-transmission test for breathing and draining devices		
15.4.4.3.1	General	No breathing and draining devices.	N / A
15.4.4.3.2	Method A – Testing by increased pressure	No breathing and draining devices.	N / A
15.4.4.3.3	Method B – Testing by oxygen enrichment of test gases	No breathing and draining devices.	N / A
15.4.4.4	Acceptance criterion	No breathing and draining devices.	N / A
15.5	Tests for “dc” devices		
15.5.1	General	Gb device.	N / A
15.5.2	Preparation of “dc” samples	Gb device.	N / A
15.5.3	Test conditions for “dc” devices		
15.5.3.1	General	Gb device.	N / A
15.5.3.2	Test procedure	Gb device.	N / A
16	Routine tests		
16.1	General		

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
16.1.1	Overview	The enclosure should be tested by static overpressure test with following test pressure within 10-60 seconds. type / the test pressure Connection cavity / 1700 kPa Power supply cavity / 1500 kPa Light source cavity / 1200 kPa After water pressure test, there is no damage to enclosure or permanent deformation on joints that affecting the flameproof performance or no leakage through the enclosure wall.	Pass
16.1.2	Routine overpressure test – first method	See Cl.16.1	Pass
16.1.3	Routine test – second method	First method was used.	N / A
16.1.4	Routine test – empty enclosure & parts of enclosure	Routine overpressure test is carried out on the empty enclosure.	Pass
16.2	Enclosures not incorporating a welded construction	Routine overpressure test has be done as Cl.16.1.1in this test report of IEC 60079-1	Pass
16.3	Enclosures incorporating a welded construction	Enclosures not incorporating a welded construction	N / A
16.4	Bushings not specific to one flameproof enclosure	See C.2.1.4.	Pass
16.5	Acceptance criteria	After water pressure test, there is no damage to enclosure or permanent deformation on joints that affecting the flameproof performance or no leakage through the enclosure wall.	Pass
16.6	Batch testing	All the products are for routine overpressure test, and there is no failed.	Pass
17	Switchgear for Group I		
17.1	General	No switchgear	N / A
17.2	Means of isolation		
17.2.1	General	No switchgear	N / A
17.2.2	Fitted inside Ex d enclosure	No switchgear	N / A

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
17.2.3	Fitted inside another enclosure	No switchgear	N / A
17.2.4	Plug and socket or a cable coupler – Compliance with 13.3	No switchgear	N / A
17.3	Doors or covers		
17.3.1	Quick-acting doors or covers	No switchgear	N / A
17.3.2	Doors or covers fixed by screws	No switchgear	N / A
17.3.3	Threaded doors or covers	No switchgear	N / A
18	Lampholders and lamp caps		
18.1	General	LED lignts	N / A
18.2	Device preventing lamps working loose	LED lignts	N / A
18.3	Holders and caps for lamps with cylindrical caps		
18.3.1	Holders and caps for tubular fluorescent lamps	LED lights	N / A
18.3.2	Other holders	LED lights	N / A
18.4	Holders for lamps with threaded caps		
18.4.1	Resistant to corrosion	LED lights	N / A
18.4.2	Contact separation	LED lights	N / A
18.4.3	E26/E27 and E39/E40 threaded lampholders	LED lights	N / A
19	Non-metallic enclosures and non-metallic parts of enclosures		
19.1	General	Wiring board is used. Refer to the drawing of 5HRLM 064 1021	Pass
19.2	Resistance to tracking and creepage distances on internal surfaces of the enclosure walls	The Max. rated votage is 240V AC. By measuring the wiring board of the sample，the minimum resistance to tracking is 6.6mm,and the minimum creepage distances is 13.8mm. Refer to material quality report of BMC, CTI is 600.	Pass

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
19.3	Requirements for type tests	The bushing is certified with the complete equipment, except the test of erosion by flame	N / A
19.4	Test of erosion by flame	Refer to 2HRLM 511 1118.1, 2HRLM 511 1118.2 and 2HRLM 511 1118.3, the cemented joints between joint sleeve and wiring board is cemented by SY6002 polyurethane.	N / A
20	MARKING		
20.1	General	See this test report cover.	Pass
20.2	Caution and warning markings	The nameplate has “Caution-Use fasteners with yield stress ⩾450MPa” .	Pass
20.3	Informative markings	Refer to the instrument, the relative information is listed on it.	Pass
21	Instructions	Refer to clause 30.1 of report IEC 60079-0 and clause 5.1 of report IEC 60079-1.	Pass
Annex A (Normative)	Additional requirements for crimped ribbon elements and multiple screen elements of breathing and draining devices		
A.1	Crimped ribbon and multiple screen elements	No breathing and draining devices.	N / A
A.2	Path dimensions	No breathing and draining devices.	N / A
A.3	Annex B requirements	No breathing and draining devices.	N / A
A.4	Type tests	No breathing and draining devices.	N / A
Annex B (Normative)	Additional requirements for elements, with non-measurable paths of breathing and draining devices		
B.1	Sintered metal elements		
B.1.1	Construction	No breathing and draining devices.	N / A
B.1.2	Bubble test pore size	No breathing and draining devices.	N / A
B.1.3	Density	No breathing and draining devices.	N / A
B.1.4	Open porosity and/or fluid permeability	No breathing and draining devices.	N / A
B.1.5	Identification	No breathing and draining devices.	N / A
B.2	Pressed metal wire elements		
B.2.1	Construction	No breathing and draining devices.	N / A
B.2.2	Specifications	No breathing and draining devices.	N / A
B.2.3	Bubble test pore size	No breathing and draining devices.	N / A

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
B.2.4	Density	No breathing and draining devices.	N / A
B.2.5	Open porosity and or fluid permeability	No breathing and draining devices.	N / A
B.2.6	Identification	No breathing and draining devices.	N / A
B.3	Metal foam elements		
B.3.1	Construction	No breathing and draining devices.	N / A
B.3.2	Chromium content	No breathing and draining devices.	N / A
B.3.3	Bubble test pore size	No breathing and draining devices.	N / A
B.3.4	Density	No breathing and draining devices.	N / A
B.3.5	Open porosity and/or fluid permeability	No breathing and draining devices.	N / A
B.3.6	Identification	No breathing and draining devices.	N / A
Annex C (Normative)	Additional requirements for flameproof entry devices		
C.1	General	Refer to 2HRLM 511 1118.1, 2HRLM 511 1118.2 and 2HRLM 511 1118.3, 1)Cable entry of The BZD130 series explosion-proof LED Lightings is one cable gland(M25×1.5). 2)The cemented joints between cavity of power supply and cavity of light source is encapsulated by SY6002 polyurethane	Pass
C.2	Constructional requirements		
C.2.1	Sealing methods		
C.2.1.1	Cable glands with elastomeric sealing rings		
C.2.1.1.1	Minimum uncompressed axial height	Single hole rubber sealing ring	N/A
C.2.1.1.2	Cable glands with only one specific elastomeric sealing ring	Uncompressed axial length of the sealing ring is 10mm, refer to 8HRLM 370 1196, 8HRLM 370 1197,and 8HRLM 370 1196.	Pass
C.2.1.2	Cable glands sealed with setting compound	Cable glands with elastomeric sealing rings.	N/A
C.2.1.3	Conduit sealing devices with setting compound	No conduit sealing devices.	N/A

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
C.2.1.4	Bushings	1) the cemented joints between joint sleeve and wiring board is cemented by SY6002 polyurethane, which cemented length is greater than10mm . 2)The cemented joints between cavity of power supply and cavity of light source is encapsulated by SY6002 polyurethane, which cemented length is greater than20mm . Thermal endurance tests were carried out on the sample. For test pressure of static pressure test, refer to 15.2.3.2.	Pass
C.2.2	Flameproof joints	Refer to clause 5.3.	Pass
C.2.2.1	Threads	Refer to clause 5.3.	Pass
C.2.2.2	Non-threaded joints (Group I only)	Group Ⅱ C	N / A
C.2.3	Constructional requirements for Ex blanking elements		
C.2.3.1	General requirements	No Ex blanking elements.	N / A
C.2.3.2	Metric Ex blanking elements	No Ex blanking elements.	N / A
C.2.3.3	NPT Ex blanking elements	No Ex blanking elements.	N / A
C.2.3.4	Non-threaded Ex blanking elements (Group I only)	No Ex blanking elements.	N / A
C.2.4	Constructional requirements for Ex thread adapters		
C.2.4.1	Compliance of threads	No Ex thread adapters.	N / A
C.2.4.2	Threads co-axial	No Ex thread adapters.	N / A
C.2.4.3	Length and internal volume	No Ex thread adapters.	N / A
C.3	Type tests		
C.3.1	Sealing test		
C.3.1.1	General	The thermal endurance test was performed to the cable gland after the mandrils being installed.	Pass

<table>
<tr><th colspan="4">IEC 60079-1</th></tr>
<tr><th>Clause</th><th>Requirement – Test</th><th>Result – Remark</th><th>Verdict</th></tr>
<tr><td>C.3.1.2</td><td>Cable glands and conduit sealing devices with sealing ring</td><td>The sealing test for unarmoured cable gland.
<table>
<tr><th rowspan="2">Type of cable gland</th><th rowspan="2">Diameter of sealing ring(mm)</th><th rowspan="2">Diameter of mandril (mm)</th><th colspan="2">Test</th><th rowspan="2">Leakage after tests (Yes/No)</th></tr>
<tr><th>Pressure(Mpa)</th><th>Duration(s)</th></tr>
<tr><td rowspan="3">M25×1.5</td><td>10</td><td>10</td><td>3</td><td>11</td><td>No</td></tr>
<tr><td>12</td><td>12</td><td>3</td><td>11</td><td>No</td></tr>
<tr><td>14</td><td>14</td><td>3</td><td>11</td><td>No</td></tr>
</table>
For the torque during the test, refer to clause C.3.2.1.</td><td>Pass</td></tr>
<tr><td>C.3.1.3</td><td>Cable glands sealed with setting compound</td><td>No setting compound</td><td>N/A</td></tr>
<tr><td>C.3.1.4</td><td>Conduit sealing devices sealed with setting compound</td><td>No setting compound</td><td>N/A</td></tr>
<tr><td>C.3.2</td><td colspan="3">Test of mechanical strength</td></tr>
<tr><td>C.3.2.1</td><td>Cable glands with a threaded compression element</td><td>For group Ⅱ C :
<table>
<tr><th>Cable type</th><th>Torque in test C3.1.1(N◎m)</th><th>Test torque (N◎m)</th><th>Damage (Y/N)</th></tr>
<tr><td rowspan="3">M25×1.5</td><td>28</td><td>56</td><td>N</td></tr>
<tr><td>30</td><td>60</td><td>N</td></tr>
<tr><td>32</td><td>64</td><td>N</td></tr>
</table></td><td>N / A</td></tr>
<tr><td>C.3.2.2</td><td>Cable glands with a compression element fixed by screws</td><td>No compression element fixed by screw.</td><td>N/A</td></tr>
<tr><td>C3.2.3</td><td>Cable glands sealed with setting compound</td><td>No sealing compound.</td><td>N/A</td></tr>
<tr><td>C3.2.4</td><td>Acceptance criteria</td><td>The cable gland was not damaged in the mechanical strength test.</td><td>Pass</td></tr>
<tr><td>C.3.3</td><td colspan="3">Type tests for Ex blanking elements</td></tr>
<tr><td>C.3.3.1</td><td>Torque test</td><td>No Ex blanking elements.</td><td>N / A</td></tr>
<tr><td>C.3.3.2</td><td>Over-pressure test</td><td>No Ex blanking elements.</td><td>N / A</td></tr>
<tr><td>C.3.4</td><td colspan="3">Type tests for Ex thread adapters</td></tr>
<tr><td>C.3.4.1</td><td>Torque test</td><td>No Ex thread adapters.</td><td>N / A</td></tr>
<tr><td>C.3.4.2</td><td>Impact test</td><td>No Ex thread adapters.</td><td>N / A</td></tr>
</table>

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
C.3.4.3	Over-pressure test	No Ex thread adapters.	N / A
Annex D (Normative)	Empty flameproof enclosures as ex components		
D.1	General	Not an empty flameproof enclosure.	N / A
D.2	Introductory remarks	Not an empty flameproof enclosure.	N / A
D.3	Ex component enclosure requirements		
D.3.1	Compliance with IEC 60079-0 & 60079-1	Not an empty flameproof enclosure.	N / A
D.3.2	Geometry of enclosure	Not an empty flameproof enclosure.	N / A
D.3.3	Rotating machines	Not an empty flameproof enclosure.	N / A
D.3.4	Means of mounting	Not an empty flameproof enclosure.	N / A
D.3.5	Drilled holes	Not an empty flameproof enclosure.	N / A
D.3.6	Reference pressure	Not an empty flameproof enclosure.	N / A
D.3.7	Overpressure	Not an empty flameproof enclosure.	N / A
D.3.8	Marking internally	Not an empty flameproof enclosure.	N / A
D.3.9	External marking provision	Not an empty flameproof enclosure.	N / A
D.3.10	Information in certificate	Not an empty flameproof enclosure.	N / A
D.4	Utilization of an Ex component enclosure certificate to prepare an equipment certificate		
D.4.1	Procedure	Not an empty flameproof enclosure.	N / A
D.4.2	Application of the schedule of limitations	Not an empty flameproof enclosure.	N / A
Annex E (Normative)	Cells and batteries used in flameproof “d” enclosures		
E.1	Introductory remarks	No cells and batteries used	N/A
E.2	Acceptable electrochemical systems	No cells and batteries used	N/A
E.3	General requirements for cells (or batteries) inside flameproof enclosures		
E.3.1	Restrictions	No cells and batteries used	N/A
E.3.2	Warning label	No cells and batteries used	N/A
E.3.3	Mounting	No cells and batteries used	N/A
E.3.4	Relative movement	No cells and batteries used	N/A
E.3.5	Verification before and after the tests of enclosures	No cells and batteries used	N/A
E.4	Arrangement of safety devices		
E.4.1	Prevention of excessive temperature and cell damage		
E.4.1.1	Short circuit condition	No cells and batteries used	N/A
E.4.1.2	Infallible components	No cells and batteries used	N/A
E.4.2	Prevention of cell polarity reversal or reverse charging by another cell in the same battery		

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
E.4.2.1	Additional protection	No cells and batteries used	N/A
E.4.2.2	Protection against polarity reversal or revere charging	No cells and batteries used	N/A
E.4.3	Prevention of inadvertent charging of a battery by other voltage sources in the enclosure	No cells and batteries used	N/A
E.5	Recharging of secondary cells inside flameproof enclosures		
E.5.1	Allowable cell type	No cells and batteries used	N/A
E.5.2	Charging condition and safety devices	No cells and batteries used	N/A
E.5.3	Reverse charging	No cells and batteries used	N/A
E.5.4	Additional safety device(s)	No cells and batteries used	N/A
E.5.5	Recharging within enclosure	No cells and batteries used	N/A
E.6	Rating of protection diodes and reliability of protection devices		
E.6.1	Voltage rating & compliance with E.4.2	No cells and batteries used	N/A
E.6.2	Voltage rating & compliance with E.4.3	No cells and batteries used	N/A
E.6.3	Current rating	No cells and batteries used	N/A
E.6.4	Safety integrity	No cells and batteries used	N/A

Annex F (Informative)	Mechanical properties for screws and nuts

Annex G (Normative)	Additional requirements for flameproof enclosures with an internal source of release (containment system)		
G.1	General	No internal source of release.	N / A
G.2	Release conditions		
G.2.1	No release	No internal source of release.	N / A
G.2.2	Limited release of a gas or vapour	No internal source of release.	N / A
G.2.3	Limited release of a liquid	No internal source of release.	N / A
G.3	Design requirements for the containment system		
G.3.1	General design requirements	No internal source of release.	N / A
G.3.2	Infallible containment system	No internal source of release.	N / A
G.3.3	Containment system with a limited release	No internal source of release.	N / A
G.4	Type tests for the containment system		
G.4.1	Overpressure test	No internal source of release.	N / A
G.4.2	Leakage test for an infallible containment system	No internal source of release.	N / A

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
G.4.3	Leakage test for a containment system with a limited release	No internal source of release.	N / A
Annex H (Normative)	Requirements for machines with flameproof “d” enclosures fed from converters		
H.1	General	Not fed from converters.	N / A
H.2	Construction requirements for bearings	Not fed from converters.	N / A
H.3	Temperature requirements	Not fed from converters.	N / A

Measurement Section, including Additional Narrative Remarks (as deemed applicable)

N / A

IECEx TEST REPORT
IEC 60079-31
Explosive atmospheres –
Part 31: Equipment dust ignition protection by enclosure "t"

ExTR Reference Number.....:	
ExTR Free Reference Number .....:	CMExC/ExTR17005G02
Compiled by + signature (ExTL) ....:	Chen fandong
Reviewed by + signature (ExTL)....:	Liu yongming
Approved by + signature (ExTL) ....:	Zhu shian
Date of issue .....:	
Ex Testing Laboratory (ExTL) .....:	China National Quality Supervision &Test Center for Explosion-proof and Safety Products for Coal Mine (CMExC)
Address .....:	No.11 Binhe Road Fushun Economic Development Area LiaoningP.R.China
Applicant's name.....:	HRLM technology Incorporated Company
Address .....:	No.15,West Henggang Street,Yangcheng Lake Town, Xiangcheng Disrict, Suzhou, Jiangsu, China
Standard.....:	IEC 60079-31:2013, 2nd edition
Test procedure .....:	IECEx System
Test Report Form Number .....:	ExTR60079-31_2A (released 2014-01)

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An Ex Test Report provides a clause-by-clause documentation of the initial evaluation and testing that verified compliance of an item or product with an IEC Ex standard. This Ex Test Report is part of an ExTR package that may include other Ex Test Report, Addendum and National Differences documents, along with a single ExTR Cover. An Ex Test Report is to be compiled and reviewed by the ExTL. The Issuing ExCB indicates final approval of the Ex Test Report as part of the overall ExTR package on the associated ExTR Cover.

Possible test case verdicts:

- test case does not apply to the test item .....:N / A

- test item does meet the requirement .....:Pass

General remarks:
The test results presented in this Ex Test Report relate only to the item or product tested.

- "(see Attachment #)" refers to additional information appended to this document.
- "(see appended table)" refers to a table appended to this document.
- Throughout this document, a point is used as the decimal separator.

The technical content of this Ex Test Report shall not be reproduced except in full without the written approval of the Issuing ExCB and ExTL.

IEC 60079-31			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
1	Scope		
2	Normative references		
3	Terms and definitions		
4	General		
4.1	Levels of protection	The protection level is “tb”.	Pass
4.2	Equipment groups and ingress protection	IP66,refer to Cl.26.4.5of IEC 60079-0 in this test report.	Pass
4.3	Requirements for electrical equipment with level of protection “ta”		
4.3.1	Fault current	The protection level is “tb”.	N/A
4.3.2	Maximum surface temperature	The protection level is “tb”.	N/A
4.3.3	Overpressure	The protection level is “tb”.	N/A
4.3.4	Dust exclusion	The protection level is “tb”.	N/A
4.3.5	Protective devices		
4.3.5.1	General	The protection level is “tb”.	N/A
4.3.5.2	Thermal protective devices	The protection level is “tb”.	N/A
4.3.6	Protection for arcing and sparking parts	The protection level is “tb”.	N/A
4.4	Requirements for electrical equipment with Level of Protection “tb” and “tc”		
4.4.1	Maximum surface temperature	refer to Cl.6.1.2 of IEC 60079-31 in this test report.	Pass
4.4.2	Over pressure	Refer to item 7/23/29 of drawing 2HRLM 511 1118.1, item 7/9/19 of drawing 2HRLM 511 1118.2 and item 7/9/19 of drawing 2HRLM 511 1118.3, the “o”ring is put in groove.	N/A
4.4.3	Dust exclusion	Refer to Cl.6.1.1 of IEC 60079-31 in this test report.	Pass
5	CONSTRUCTION		
5.1	Joints		
5.1.1	General	Refer to Cl.5.2 of IEC 60079-1 in this test report.	Pass
5.1.2	Threaded joints	Refer to Cl.5.3 of IEC 60079-1 in this test report.	Pass
5.1.3	Gaskets and seals	Refer to Cl.6.5 of IEC 60079-0 in this test report.	Pass
5.1.4	Cemented joints	No cemented joints used on mating parts.	N/A

IEC 60079-31			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
5.1.5	Operating rods, spindles and shafts	No Operating rods, spindles and shafts.	N/A
5.1.6	Windows		
5.1.6.1	Windows employing a cemented joint	Refer to Cl.6.1 of IEC 60079-1 in this test report.	Pass
5.1.6.2	Windows employing a gasket joint	No gasket joint	N/A
5.2	Cable glands	Refer to Cl.16.3 of IEC 60079-0, Cl.4.2 and Cl.5.1 of IEC 60079-31, Cable gland meet requirements. Cable gland is tested with the equipment.	Pass
5.3	Entries		
5.3.1	Plain entries	No Plain entries	N/A
5.3.2	Threaded entries	Refer to Cl.5.3 of IEC 60079-1 in this test report.	Pass

6	Verification and tests		
6.1	Type tests		
6.1.1	Type tests for dust exclusion by enclosures		
6.1.1.1	General	Tests were carried out according to IEC 60079-0, IEC 60079-1 and IEC 60079-31 in the Labs of CMExC.	Pass
6.1.1.2	Impact test for supplementary enclosures	Refer to Cl.26.4.2 of IEC 60079-0 in this test report.	Pass
6.1.1.3	Pressure test	Refer to item 7/23/29 of drawing 2HRLM 511 1118.1, item 7/9/19 of drawing 2HRLM 511 1118.2 and item 7/9/19 of drawing 2HRLM 511 1118.3, the “o”ring is put in groove.	N/A
6.1.1.4	IP test	Refer to Cl.26.4.5 of IEC 60079-0 in this test report.	Pass
6.1.2	Thermal tests	Refer to Cl.26. 5 of IEC 60079-0 in this test report.	Pass
6.2	Routine tests		

7	Marking	tb, refer to Cl.29. 5 of IEC 60079-0 in this test report.	Pass

Measurement Section, including Additional Narrative Remarks (as deemed applicable)