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TEST REPORT

RA00-038838

MANUFACTURER

Company	:	ILSHIN Industrial Electric Co., Ltd.
Address	:	200-1, 26, Gwangju-daero,
Location	:	Gwangju-si, Gyeonggi-do 12739, Korea, Republic of

APPARATUS

Name	:	EXPLOSION PROOF FLAME DETECTOR
Type/Model	:	C7061F1011-N and C7035C1000-N
Protection mode	:	« db », « tb »
Category	:	Ex II 2 GD

ASSESSMENT STANDARDS

EN IEC 60079-0 : 2018
EN 60079-1 : 2014
EN 60079-31 : 2014

	Compiled by	*Reviewed by*	*Approved by (ExCB)*
NAME	F.BOQUILLET	O. COTTIN	**Thierry HOUEIX**
Function			**Ex Certification Officer**
Date	27/09/2023	24/10/2023	**2023-10-25**
Visa			 Signé électroniquement Digitally signed by Thierry HOUEIX Ex Certification Officer Délégué Certification

This assessment report is composed of the following reports:

- IECEx Test Report Cover KR/KGS/EXTR 23.0004/00, with annexed test reports IEC 60079-0, IEC 60079-1, IEC 60079-31;
- Certificate of conformity IECEx KGS 23.0004X issue 00.

Assessment summary:

The C7061F1011-N and C7035C1000-N are flame detectors for sensing the ultraviolet generated by the combustion of gas, oil, or other fuels. 61F is a self checking model including a shutter, and 35C is a nonself checking model without a shutter. This equipment must be used with Honeywell's burner controller, which is located outside the hazardous area.

Explosion Proof Flame Detector(C7061F1011-N, C7035C1000-N) is designed for use in a potentially explosive atmosphere of the gas group and dust group. The Ex grade is “Ex db IIC T6 Gb” and "Ex tb IIIC 80°C Db". The ambient temperature range is -20°C ≤ Ta ≤ +70°C. The enclosure is made of aluminum alloy and it has a threaded joint between the cover and the face plate. This equipment includes quartz glass, the epoxy that fixes the quartz glass, and the O-ring.

The equipment provides a degree of protection IP66 in accordance with EN 60079-0 and EN 60529 standards.

The Ex equipment has been evaluated and certified IECEx by KGS. It owns the IECEx certificate IECEx KGS 23.0004X issue 00. We accept the assessments and tests because done in the IECEx scheme.

The differences between IEC standards and EN standards concern only the marking plates.

Propose to certification: **YES** ⊙ **NO** ○

IECEx TEST REPORT COVER

ExTR Reference Number..... :	KR/KGS/ExTR23.0004/00
ExTR Free Reference Number ..... :	2022-0857501
Compiled by + signature (ExTL) .... :	Hyun-woo, Park
Reviewed by + signature (ExTL).... :	Jong-gyoon, Jun
Endorsed by + signature (ExCB) ... :	Yung-hwa, Lee
Date of issue ..... :	2023.07.17.
Ex Testing Laboratory (ExTL)..... :	KGS
Address ..... :	1390 Wonjung-ro, Maengdong-myeon, Eumseong-gun, Chungcheongbuk-do, Korea, Republic of
Ex Certification Body (ExCB)..... :	KGS
Address ..... :	1390 Wonjung-ro, Maengdong-myeon, Eumseong-gun, Chungcheongbuk-do, Korea, Republic of
Applicant's name..... :	Honeywell Co., Ltd.
Address ..... :	28, 2Gongdan 2-ro, Seobuk-gu, Cheonan-si Chungcheongnam-do, Korea, Republic of
Standards associated with this ExTR package ..... :	IEC 60079-0:2017, 7th Edition IEC 60079-1:2014, 7th Edition IEC 60079-31:2022, 3th Edition
Clauses considered ..... :	All clauses considered
Test Report Form Number..... :	ExTR Cover_10 (released 2022-10)
Related Amendments, Corrigenda or ISHs ..... :	All related documents were reviewed.
Test item description..... :	Explosion Proof Flame Detector
Model/type reference ..... :	C7061F1011-N C7035C1000-N
Code (e.g. Ex __ II__ T__)..... :	Ex db IIC T6 Gb Ex tb IIIC 80℃ Db
Rating..... :	115 or 230Vac, 50/60Hz

ExTR Package Contents
Assembled ExTR documents and Additional reference material:
IECEx Test Report Cover
IECEx Test Report: IEC 60079-0, Edition 7th
IECEx Test Report: IEC 60079-1, Edition 7th
IECEx Test Report: IEC 60079-31, Edition 3th

Manufacturer's name .....:	ILSHIN Industrial Electric Co., Ltd.
Address .....:	200-1, 26, Gwangju-daero, Gwangju-si, Gyeonggi-do 12739 Korea, Republic of
Trademark .....:	ISIE ILSHIN Industrial Electric Co., Ltd. Gyeonggi-do, Republic of Korea
Certificate No. (optional) .....:	IECEx KGS 23.0004X
QAR Reference No. (optional) .....:	NL/DEK/QAR16.0004/03

Particulars: Test item vs. Test requirements

Classification of installation and use ..... :	Fixed
Ingress protection .....:	IP66
Rated ambient temperature range (°C).....:	-20°C to +70°C
Rated service temperature range (°C) for Ex Components .....:	N/A

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.

Use of uncertainty of measurement for decisions on conformity (Decision rule):

No decision rule is specified by the standards associated with this ExTR package, when comparing the measurement result with the applicable limit according to the specification in these standards. The decisions on conformity are made without applying the measurement uncertainty as described in IECEx OD 012 (i.e. "simple acceptance" decision rule, previously known as "accuracy method").

General product information:

The C7061F1011-N and C7035C1000-N are flame detectors for sensing the ultraviolet generated by the combustion of gas, oil, or other fuels. 61F is a self checking model including a shutter, and 35C is a non-self checking model without a shutter. This equipment must be used with Honeywell's burner controller, which is located outside the hazardous area.

Applicable burner controller types depending on the frame detector are as bellows.

Models of burner controller	Models of equipment	
	C7061F1011-N	C7035C1000-N
7800 Series	O	O
R8001 Series	O	O
FDU510*3***** Series	X (These burner controllers are only for C7035C1000-N)	O
DBC1500/2000 Series		O
BC1000A*U Series		O

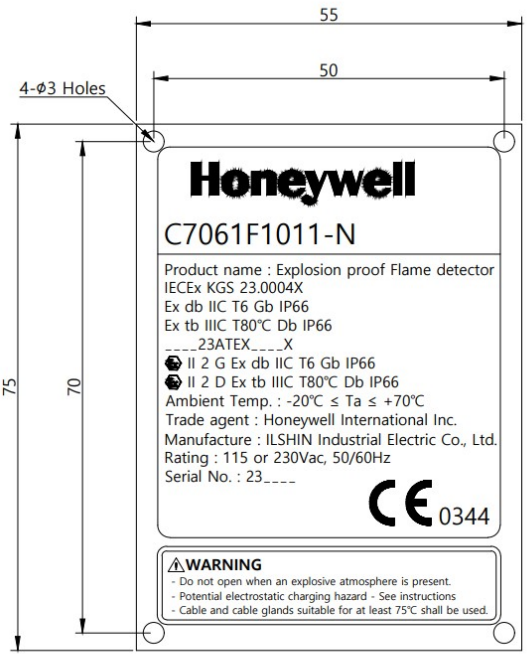
Explosion Proof Flame Detector(C7061F1011-N, C7035C1000-N) is designed for use in a potentially explosive atmosphere of the gas group and dust group. The Ex grade is ″Ex db IIC T6 Gb″ and "Ex tb IIIC 80°C Db". The ambient temperature range is -20 °C ≤ Ta ≤ +70 °C. The enclosure is made of aluminum

alloy and it has a threaded joint between the cover and the face plate. This equipment includes quartz glass, the epoxy that fixes the quartz glass, and the O-ring.

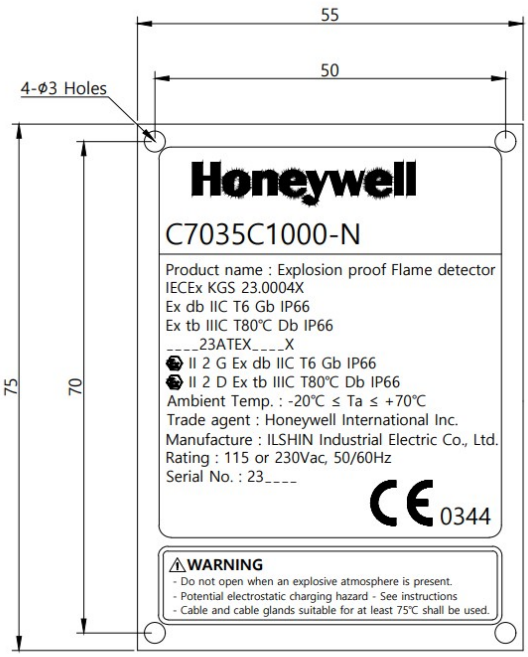
Details of change (applicable only when revising an existing ExTR package):

N/A

Copy of Marking Plate:



Marking plate
C7061F1011-N



Marking plate
C7035C1000-N

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

N/A

[Case 1, Where the name of the actual manufacturer (OEM) appears on the product and on the accompanying instructions, etc., in addition to the name of the distributor or agent.]

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. This equipment is designed for use in an ambient temperature range of -20 °C to +70 °C.

2. Contact the manufacturer for information on the dimensions of the flameproof joints.

3. When installing and using the equipment, follow the installation manual provided by the manufacturer and IEC 60079-14.

4. For entries, use Ex-certified cable glands only with a minimum IP degree in accordance with the marking.

5. The service temperature at the entry point is above 70°C. Users should check the appropriate cable entry device and cable selection guidelines..

6. Potential electrostatic charging hazard - See instructions

Routine tests:

N/A

(An overpressure test was conducted at 4 times the reference pressure with an enclosure that does not apply the routine test.)

Date(s) of performance for all testing:

1. thermal tests: 2023.01.17. ~ 2023.05.24.

2. thermal endurance test to heat & cold: 2023.02.08. ~ 2022.03.10.

3. resistance to impact test: 2023.02.20., 2023.03.10.

4. Thermal shock test: 2023.02.20.

5. IP test : 2023.03.13..

6. flamepath measurement : 2023.03.20.

7. determination of explosion pressure : 2023.03.20.~ 2023.03.21.

8. overpressure test : 2023.05.11.

9. test for non-transmission of an internal ignition : 2023.05.11.

Technical Documents

Title:	Drawing No.:	Rev. Level:	Date:
Assembly	ISIE-D-22-16-01	0	2022. 10. 03.
Ex detail	ISIE-D-22-16-02	0	2022. 10. 03.
Cover O-ring	ISIE-D-22-16-03	0	2022. 10. 03.
Face plate	ISIE-D-22-16-04	0	2022. 10. 03.
Cover	ISIE-D-22-16-05	0	2022. 10. 03.
Viewing window	ISIE-D-22-16-06	0	2022. 10. 03.
Lock nut (61F)	ISIE-D-22-16-07	0	2022. 10. 03.
Lock nut (35C)	ISIE-D-22-16-08	0	2022. 10. 03.
Flame detector (61F)	ISIE-D-22-16-09	0	2022. 10. 03.
Flame detector (35C)	ISIE-D-22-16-10	0	2022. 10. 03.
Terminal block	ISIE-D-22-16-11	0	2022. 10. 03.
Marking plate	ISIE-D-22-16-12	0	2022. 10. 03.
Convex lens	ISIE-D-22-16-13	0	2022. 10. 03.
Mounting flange	ISIE-D-22-16-14	0	2022. 10. 03.
Mounting flange O-ring	ISIE-D-22-16-15	0	2022. 10. 03.
Mounting flange fixing screw packing	ISIE-D-22-16-16	0	2022. 10. 03.
Directional sticker & Earth marking sticker	ISIE-D-22-16-17	0	2022. 10. 03.
Purge air inlet plug	ISIE-D-22-16-18	0	2022. 10. 03.

*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..... :	KR/KGS/ExTR23.0004/00
ExTR Free Reference Number ..... :	2022-0857501
Compiled by + signature (ExTL) .... :	Hyun-woo, Park
Reviewed by + signature (ExTL).... :	Jong-gyoon, Jun
Date of issue ..... :	2023.07.17.
Ex Testing Laboratory (ExTL)..... :	KGS (Korea Gas Safety Corporation)
Address ..... :	1390 Wonjung-ro, Maengdong-myeon, Eumseong-gun, Chungcheongbuk-do, Korea, Republic of
Applicant's name..... :	Honeywell Co., Ltd.
Address ..... :	28, 2Gongdan 2-ro, Seobuk-gu, Cheonan-si Chungcheongnam-do, Korea, Republic of
Standard..... :	IEC 60079-0:2017, Edition 7.0
Test procedure..... :	IECEx System
Test Report Form Number ..... :	ExTR60079-0-7F-DS (released 2022-10)
Related Amendments, Corrigenda or ISHs	All related documents were reviewed

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.

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IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
1 **DS 2021/004**	Scope		
2	Normative references		
3 **DS 2020/002**	Terms and definitions		
4	Equipment grouping		
4.1	General	This equipment is intended for group IIC and IIIC.	Pass
4.2	Group I	This equipment is not intended for group I.	N/A
4.3	Group II	This equipment is intended for group IIC.	Pass
4.4	Group III	This equipment is intended for group IIIC.	Pass
4.5	Equipment for a particular explosive gas atmosphere	This equipment is not tested for a particular explosive atmosphere.	N/A
5 **DS 2016/002** **DS 2015/011A**	Temperatures		
5.1	Environmental influences		
5.1.1	Ambient temperature	This equipment is designed for use in a ambient temperature range of -20℃ to +70℃. (“X” marking)	Pass
5.1.2 **DS 2022/002**	External source of heating or cooling	This equipment is not designed for use with external source of heating or cooling.	N/A

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
5.2 **DS 2020/006**	Service temperature	The service temperature was determined for the thermal test result and specification of the equipment. Service temperature is below. C7061F1011-N: 73.3°C C7061C1000-N: 72.3°C See clause 26.5.1 for thermal tests details.	Pass

5.3	Maximum surface temperature		
5.3.1	Determination of maximum surface temperature	The maximum surface temperature was determined under the most adverse rating with 110% of the rated current during AC source. Maximum surface temperature: 74.8°C See clause 26.5.1 for thermal tests details.	Pass
5.3.2	Limitation of maximum surface temperature		
5.3.2.1	Group I electrical equipment	This equipment is not group I.	N/A
5.3.2.2	Group II electrical equipment	The maximum surface temperature was not exceed the temperature corresponding to T6. See clause 26.5.1 for thermal tests details.	Pass
5.3.2.3	Group III electrical equipment		
5.3.2.3.1 **DS 2020/006**	Maximum surface temperature for EPL Da	This equipment is not for EPL Da.	N/A
5.3.2.3.2	Maximum surface temperature for EPL Db	The maximum surface temperature was determined without a layer of dust and not exceed the temperature corresponding to T80°C. See clause 26.5.1 for thermal tests details.	Pass
5.3.2.3.3	Maximum surface temperature determined without a layer of dust for EPL Dc	This equipment is not for EPL Dc.	N/A
5.3.3	Small component temperature for Group I or Group II electrical equipment	There is no small component in this equipment.	N/A
5.3.4	Component temperature of smooth surfaces for Group I or Group II electrical equipment	This is not applicable.	N/A

6	Requirements for all electrical equipment		

6.1	General	This equipment comply with the requirements of IEC 60079-0, -1, -31.	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
6.2	Mechanical strength of equipment	This equipment was tested for mechanical strength. See clause 26.4 for tests of enclosures details.	Pass
6.3	Opening times	This equipment has the following warning marking. “Do not open when an explosive atmosphere is present”	Pass
6.4	Circulating currents in enclosures (e.g. of large electric machines)	This equipment is not affected by circulating currents. And it is provided with internal and external earth connections.	Pass
6.5	Gasket retention	This equipment has an O-ring between the face plate and cover. The gasket is fixed to the cover side. When the joint is opened and closed before IP test of enclosure, the gasket was fixed and not adhered to one side.	Pass
6.6	Electromagnetic and ultrasonic energy radiating equipment		
6.6.1	General	This equipment is not electromagnetic and ultrasonic energy radiating equipment	N/A
6.6.2	Radio frequency sources	See clause 6.6.1.	N/A
6.6.3	Ultrasonic sources	See clause 6.6.1.	N/A
6.6.4 **DS 2018/004**	Lasers, luminaires, and other non-divergent continuous wave optical sources	See clause 6.6.1.	N/A
7	Non-metallic enclosures and non-metallic parts of enclosures		
7.1	General		
7.1.1	Applicability	This equipment has elastomer and materials used for cementing. See clauses 7.1.2.3 and 7.1.2.4	Pass
7.1.2	Specification of materials		
7.1.2.1	General	Non-metallic materials of this equipment are specified in the documents according to clause 24.	Pass
7.1.2.2	Plastic materials	This equipment has not plastic materials.	N/A

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
7.1.2.3	Elastomers	The following is included. a) Manufacturer: Sangjin Chemical Rubber Ind. b) Size No.: AN 242 c) Model 1) Silicone 60 2) Viton 60 d) Color 1) Silicone 60: Translucency, Red 2) Viton 60: Black e) COT 1) Silicone 60: -40°C ~ +200°C 2) Viton 60: -60°C ~ +150°C Specific information refer to the data sheet	Pass
7.1.2.4	Materials used for cementing	The following is included. a) Manufacturer: LOCTITE b) Model: STYCAST 2651-40FR c) Using curing agent: Catalyst 9 d) Mix ratio: 100gram / 9gram(Curing agent) e) Cure time: 25°C (16-24hours) f) COT: -40°C ~ +130°C g) Color: Black Specific information refer to the data sheet	Pass

7.2	Thermal endurance		
7.2.1	Tests for thermal endurance	See clauses 26.8 and 26.9 for thermal endurance tests details.	Pass
7.2.2	Material selection	The elastomer and the material used for cementing have a temperature at least 20 K greater than the maximum service temperature of the enclosure. And it has a minimum temperature that is below the minimum service temperature.	Pass
7.2.3	Alternative qualification of elastomeric sealing O-rings	Elastomeric sealing O-ring is tested with enclosure.	N/A

7.3	Resistance to ultraviolet light	There are no non-metallic materials that exposure to the light.	N/A

7.4	Electrostatic charges on external non-metallic materials

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
7.4.1	Applicability	This equipment has external non-metallic material a) Part: Directional sticker b) Material: Polycarbonate film c) Surface area of label: 680mm^2	Pass
7.4.2	Avoidance of a build-up of electrostatic charge for Group I or Group II	The maximum surface area of external non-metallic material of this equipment is less than 2000mm^2	Pass
7.4.3	Avoidance of a build-up of electrostatic charge for Group III	As fixed installation devices, instructions are provided to minimize the risk of electrostatic discharge. (“X” marking) “Use wet cloth for cleaning and handling”	Pass

7.5	Attached external conductive parts	There are no attached external conductive parts with a resistance to earth of more than 1GΩ measured at (500 ± 25) V dc.	N/A

8	Metallic enclosures and metallic parts of enclosures

8.1	Material composition	The material of the enclosure is specified in the document. a) Aluminium alloy: Face plate, cover, lock nut, mounting flange b) Stainless steel 304: Marking plate c) Carbon steel S45C: Purge air inlet plug d) Brass C3604-BE-F: Purge air inlet plug e) Stainless steel 304/304L, 316/316L: Purge air inlet plug Specific information refer to the data sheet.	Pass

8.2	Group I	This equipment is not intended for group I.	N/A

8.3	Group II	This equipment’s EPL is Gb. Magnesium, titanium and zirconium total is less than 7.5% Specific information refer to the data sheet.	Pass

8.4	Group III	This equipment’s EPL is Db. Magnesium, titanium and zirconium total is less than 7.5% Specific information refer to the data sheet.	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
8.5	Copper Alloys	This equipment is used in an acetylene atmosphere. Body of this equipment is not constructed of copper or copper alloys. But this equipment has purge air inlet plug, one of material is brass. The content of copper is 58.03% Specific information refer to the data sheet.	Pass
9	Fasteners		
9.1	General	This equipment has a hexagon socket set screw for fixing the threaded cover.	Pass
9.2	Special fasteners	This equipment does not used special fastener.	N/A
9.3	Holes for special fasteners		
9.3.1	Thread engagement	This equipment does not used special fastener.	N/A
9.3.2	Tolerance and clearance	This equipment does not used special fastener.	N/A
9.4	Hexagon socket set screws	Hexagon socket set screw does not protrude from the screw hole after tightening.	Pass
10	Interlocking devices	This equipment does not contain interlocking device.	N/A
11	Bushings	This equipment does not contain bushing.	N/A
12	(Reserved for future use)		
13 **DS 2014/001** **DS 2021/006**	Ex Components		
13.1	General	This equipment is not Ex components.	N/A
13.2	Mounting	See clause 13.1.	N/A
13.3	Internal mounting	See clause 13.1.	N/A
13.4	External mounting	See clause 13.1.	N/A

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
13.5 DS 2020/002	Ex Component certificate	See clause 13.1.	N/A
14	Connection facilities		
14.1	General	This equipment has terminal block for connection to external power.	Pass
14.2	Type of protection	The enclosure of the connection facility is protected with type of protection "db" and "tb".	Pass
14.3	Creepage and clearance	Type of protection “db” and “tb” does not concern creepage and clearance.	N/A
15	Connection facilities for earthing or bonding conductors		
15.1	Equipment requiring earthing or bonding		
15.1.1	Internal earthing	Internal earthing is provided inside the equipment. a) Cross Recessed pan head screw or Hexagon head screw M4 x 0.7P Length-10L, Stainless steel 304 b) 4 mm^2, Spring washer, stainless steel 304 c) 4 mm^2, Plain washer, stainless steel 304	Pass
15.1.2	External bonding	External earthing is provided outside the equipment. a) Cross Recessed pan head screw or Hexagon head screw M4 x 0.7P Length-8L, Stainless steel 304 b) 4 mm^2, Spring washer, stainless steel 304 c) 4 mm^2, Plain washer, stainless steel 304	Pass
15.2	Equipment not requiring earthing	This is not applicable.	N/A
15.3	Size of protective earthing conductor connection	See comment in Clauses 15.1.1 and 15.1.2.	Pass
15.4	Size of equipotential bonding conductor connection	Equipment bonding connection facilities on the outside of equipment provide effective connection of a conductor with a cross-sectional area of at least 4 mm^2.	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
15.5	Protection against corrosion	For protection against corrosion, the earth facilities are made of Stainless steel See comment in Clauses 15.1.1 and 15.1.2	Pass
15.6	Secureness of electrical connections	For secureness of electrical connections, anti-rotation is provided by the use of spring washer. See comment in Clauses 15.1.1 and 15.1.2	Pass
15.7	Internal earth continuity plate	This equipment is not used Internal earth continuity plate .	N/A
16 **DS 2017/001**	Entries into enclosures		
16.1	General	This equipment has one entry into the enclosure. Entry is the threaded hole located in the wall of the enclosure. There are two types of entries, and three sizes are available for each type. Details are following a) type: NPT thread(3/8”, 1/2”, 3/4”) b) type: Metric thread(M16, M20, M25, pitch: 1.5)	Pass
16.2	Identification of entries	Information of entry(size, position and dimensions) is specified in the instruction manual and drawings. See comment in clause 16.1	Pass
16.3	Cable glands	Cable gland installed in accordance with the instruction manual is not invalidate the specific characteristics of the Type of Protection of the equipment. This equipment shall use the Ex certified cable gland.	Pass
16.4	Blanking elements	This equipment does not use blanking element.	N/A
16.5	Thread adapters	This equipment does not use thread adapter.	N/A

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
16.6 DS 2018/002	Temperature at branching point and entry point	This equipment has a service temperature at entry higher than 70 ℃. Guideline of selection of cable and cable gland is specified in the manual. “Cable & cable gland suitable for at least 75℃ shall be used.”	Pass
16.7	Electrostatic charges of cable sheaths	This is not applicable.	N/A
17	Supplementary requirements for electric machines		
17.1	General	This equipment is not an electric machine.	N/A
17.2	Ventilation		
17.2.1	Ventilation openings	See clause 17.1.	N/A
17.2.2 DS2022/006	Materials for external fans	See clause 17.1.	N/A
17.2.3	Cooling fans of rotating electric machines	See clause 17.1.	N/A
17.2.3.1	Fans and fan hoods	See clause 17.1.	N/A
17.2.3.2	Construction and mounting of the ventilating systems	See clause 17.1.	N/A
17.2.3.3	Clearances for the ventilating system	See clause 17.1.	N/A
17.2.4	Auxiliary motor cooling fans	See clause 17.1.	N/A
17.2.5	Room ventilating fans		
17.2.5.1	Applicability	See clause 17.1.	N/A
17.2.5.2	General	See clause 17.1.	N/A
17.2.5.3	Fan and fan hoods	See clause 17.1.	N/A
17.2.5.4	Construction and mounting	See clause 17.1.	N/A
17.2.5.5	Clearances for rotating parts	See clause 17.1.	N/A
17.3	Bearings	See clause 17.1.	N/A
18	Supplementary requirements for switchgear		
18.1	Flammable dielectric	This equipment is not switchgear.	N/A
18.2	Disconnectors	See clause 18.1.	N/A

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
18.3	Group I – Provisions for locking	See clause 18.1.	N/A
18.4	Doors and covers	See clause 18.1.	N/A
19	Reserved for future use		
20 **DS 2020/007**	Supplementary requirements for external plugs, socket outlets and connectors for field wiring connection		
20.1	General	This equipment is not external plug, socket outlet and connector for field wiring connection.	N/A
20.2	Explosive gas atmospheres	See clause 20.1.	N/A
20.3	Explosive dust atmospheres	See clause 20.1.	N/A
20.4	Energized plugs	See clause 20.1.	N/A
21	Supplementary requirements for luminaires		
21.1 **DS 2020/001**	General	This equipment is not luminaire.	N/A
21.2	Covers for luminaires of EPL Mb, EPL Gb, or EPL Db	See clause 21.1.	N/A
21.3	Covers for luminaires of EPL Gc or EPL Dc	See clause 21.1.	N/A
21.4	Sodium lamps	See clause 21.1.	N/A
22	Supplementary requirements for caplights and handlights		
22.1	Group I caplights	This equipment is not caplight and handlight.	N/A
22.2	Group II and Group III caplights and handlights	See clause 22.1.	N/A
23	Equipment incorporating cells and batteries		

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
23.1	General	This equipment does not have cell and battery.	N/A
23.2	Interconnection of cells to form batteries	See clause 23.1.	N/A
23.3 **DS 2019/002**	Cell types	See clause 23.1.	N/A
23.4	Cells in a battery	See clause 23.1.	N/A
23.5	Ratings of batteries	See clause 23.1.	N/A
23.6	Interchangeability	See clause 23.1.	N/A
23.7	Charging of primary batteries	See clause 23.1.	N/A
23.8	Leakage	See clause 23.1.	N/A
23.9	Connections	See clause 23.1.	N/A
23.10	Orientation	See clause 23.1.	N/A
23.11	Replacement of cells or batteries	See clause 23.1.	N/A
23.12	Replaceable battery pack	See clause 23.1.	N/A
24	Documentation	The manufacturer submitted documents that give the full and correct specification of the equipment in reference to the safety aspects.	Pass
25	Compliance of prototype or sample with documents	The samples of the device subjected to the type verifications and tests comply with the manufacture's documents submitted in accordance with clause 24.	Pass
26 **DS 2017/005**	Type tests		

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
26.1	General	The samples were tested and reviewed in accordance with IEC 60079-0, -1 & -31.	Pass
26.2	Test configuration	Each samples was tested in the configuration of the equipment considered to be the most unfavourable.	Pass
26.3	Tests in explosive test mixtures	Tests for explosive mixtures were performed as specified in IEC 60079-1.	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	Metallic enclosure, metallic part of enclosures and glass part of enclosure were tested in the following order - Test for resistance to impact. - Test for degree of protection(IP) - Thermal test - Type tests specified in IEC 60079-1 & -31 As this equipment has non-metallic gasket and cemented joint, the requirements of clause 26.4.1.2 were applied.	Pass
26.4.1.2	Non-metallic enclosures or non-metallic parts of enclosures		
26.4.1.2.1	General	This equipment has two gaskets(Viton 60 and Silicone 60). Non-metallic parts of enclosure were tested according to the flowchart in Annex F. Four samples were tested for the cemented joint. Two samples were tested for each gasket(O-ring) model. Details of samples are following. All cemented joints of sample are identical. Sample1: Type of gasket is Viton 60 Sample2: Type of gasket is Silicone 60 Sample3: Type of gasket is Viton 60 Sample4: Type of gasket is Silicone 60	Pass
26.4.1.2.2	Group I equipment	This equipment is not intended for group I.	N/A

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
26.4.1.2.3	Group II and Group III equipment	All samples were tested for thermal endurance to heat and cold. For cemented joint, at high temperature(85 °C), test of resistance to impact was conducted on Sample1 and 2. At low temperature(-25 °C), test of resistance to impact was conducted on Sample3 and 4. Tests for degree of protection(IP) were conducted on all sample. All joints were opened and closed.	Pass
26.4.2 **DS 2020/001**	Resistance to impact	The test was conducted on enclosure with condition of high risk of mechanical danger. It has glass part. but because of its small size and nearby structures, the 25mm hemisphere cannot reach it. In the final product, additional structure is installed on the glass. Resistance to impact tests were carried out below. - 0.7m from the metallic enclosure. See clause 26.4.1.2.3	Pass
26.4.3	Drop test	This equipment is fixed for use.	N/A
26.4.4	Acceptance criteria	There is not damage that invalidates the explosion-proof structure.	Pass
26.4.5 **DS 2012/003**	Degree of protection (IP) by enclosures		
26.4.5.1	Test procedure	IP 66 testing was carried out in accordance with IEC 60529. It was pretreated in accordance with IEC 60079-0 Annex F	Pass
26.4.5.2	Acceptance criteria	Dust and water did not penetrate into the enclosure.	Pass

26.5	Thermal tests
26.5.1	Temperature measurement

<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>26.5.1.1</td><td>General</td><td>Thermal tests were conducted following clause in this standard.
There are two models of this equipment.
One is C7035C1000-N. The other is C7061F1011-N.
This equipment has five burner controller and is not to be used without a burner controller. The thermal test was conducted including the burner controllers, and the specifications of the burner controller are included in the manufacturer's documentation. The burner controller is installed in a safe area.
Below is result of tests.
<table>
<tr><td rowspan="2">Models of burner controller</td><td colspan="2">Models of equipment</td></tr>
<tr><td>C7061F1011-N</td><td>C7035C1000-N</td></tr>
<tr><td>7800 Series</td><td>O
Ts: 73.3°C
Tmax: 74.0°C</td><td>O
Ts: 72.3°C
Tmax: 73.5°C</td></tr>
<tr><td>R8001 Series</td><td>O
Tmax: 71.3°C</td><td>N/A
Do not conducted</td></tr>
<tr><td>FDU510*3***** Series</td><td rowspan="3">X
(These burner controllers are only for C7035C1000-N)</td><td>O
Tmax: 71.6°C</td></tr>
<tr><td>DBC1500/2000 Series</td><td>O
Tmax: 73.4°C</td></tr>
<tr><td>BC1000A*U Series</td><td>O
Tmax: 74.8°C</td></tr>
</table></td><td>Pass</td></tr>
<tr><td>26.5.1.2</td><td>Service temperature</td><td>The service temperature was determined for the thermal test result and specification of the equipment.
Service temperature is below.
C7061F1011-N: 73.3°C
C7061C1000-N: 72.3°C
See clause 26.5.1 for thermal tests details.</td><td>Pass</td></tr>
<tr><td>26.5.1.3</td><td>Maximum surface temperature</td><td>The maximum surface temperature was determined under the most adverse rating with 110% of the rated current during AC source.
Maximum surface temperature: 74.8°C
See clause 26.5.1 for thermal tests details.</td><td>Pass</td></tr>
<tr><td>26.5.2</td><td>Thermal shock test</td><td>Thermal shock tests were conducted at temperature(85°C) above the maximum service temperature. There was no damage to the glass.</td><td>Pass</td></tr>
<tr><td>26.5.3</td><td colspan="3">Small component ignition test (Group I and Group II)</td></tr>
<tr><td>26.5.3.1</td><td>General</td><td>This equipment is not small component.</td><td>N/A</td></tr>
</table>

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
26.5.3.2	Procedure	See clause 26.5.3.1.	N/A
26.5.3.3	Acceptance criteria	See clause 26.5.3.1.	N/A

26.6	Torque test for bushings		
26.6.1	Test procedure	The equipment does not have bushing.	N/A
26.6.2	Acceptance criteria	See clause 26.6.1.	N/A

26.7	Non-metallic enclosures or non-metallic parts of enclosures		
26.7.1	General	The non-metallic parts, the gasket(O-ring) and cemented joint were tested according to clauses 26.8 and 26.9 with metallic bodies. See clause 26.4.1.2.	Pass
26.7.2	Test temperatures	The high temperature condition was 85°C, and the low temperature condition was tested at -25°C. See clause 26.4.1.2.3.	Pass

26.8 **DS 2020/003**	Thermal endurance to heat	For thermal endurance to heat, four samples were tested following conditions. - 672 hours at 95 °C, (90 ± 5) % RH - 24 hours at (20 ± 5) °C, (50 ± 10) % RH (Normal Condition)	Pass

26.9	Thermal endurance to cold	For thermal endurance to cold, four samples were tested following conditions. - 24 hours at -25 °C	Pass

26.10	Resistance to UV light		
26.10.1	General	There are no non-metallic parts of enclosures exposed to UV light.	N/A
26.10.2	Light exposure	See clause 26.10.1.	N/A
26.10.3	Acceptance criteria	See clause 26.10.1.	N/A

26.11	Resistance to chemical agents for Group I equipment	This equipment is not intended for Group I.	N/A

26.12	Earth continuity	This is not applicable.	N/A

26.13	Surface resistance test of parts of enclosures of non-metallic materials	Because of clause 7.4, this clause is not applicable.	N/A

26.14	Measurement of capacitance		

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
26.14.1	General	Because of clause 7.5, this clause is not applicable.	N/A
26.14.2	Test procedure	See clause 26.14.1.	N/A
26.15	Verification of ratings of ventilating fans	This equipment is not electric machine. This clause is not required.	N/A
26.16	Alternative qualification of elastomeric sealing O-rings	Because of clause 7.2.3, this clause is not applicable.	N/A
26.17	Transferred charge test		
26.17.1	Test equipment	Because of clause 7.4, this clause is not applicable.	N/A
26.17.2	Test sample	See clause 26.17.1.	N/A
26.17.3	Test procedure	See clause 26.17.1.	N/A
27	Routine tests	Routine testing is not required because the overpressure test has completed at 4 times the reference pressure according to IEC 60079-1.	N/A
28	Manufacturer's responsibility		
28.1	Conformity with the documentation	The manufacturer is conducting the necessary verifications to ensure that the equipment produced comply with the documentation.	Pass
28.2 **DS 2020/002** **DS 2021/005**	Certificate	The manufacturer prepares certificates confirming that the equipment is on conformity with the requirements of the document.	Pass
28.3	Responsibility for marking	The manufacturer marks the equipment in accordance with clause 29 indicating they have taken responsibility for the requirements specified in this clause.	Pass
29 **DS 2012/005A** **DS 2017/007** **DS 2021/005** **DS 2021/006**	Marking		

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
29.1	Applicability	Marking is applied to Ex equipment, which comply with the requirements IEC 60079-0, -1 & -31.	Pass
29.2	Location	The markings are marked on the body of this equipment and is visible, from the exterior, prior to the installation of this equipment.	Pass
29.3	General	The marking includes the following a) The name of the manufacturer: ILSHIN Industrial Electric Co., Ltd. b) Type identification: C7061F1011-N, C7061C1000-N c) A serial number: stamped on the name plate d) The name of the certificate issuer: KGS e) “X” marking - Applied clauses: 5.1.1, 7.4.3(IEC 60079-0), 5.1(IEC 60079-1) f) Ex db IIC T6 Gb & Ex tb IIIC T80℃ Db g) Additional marking: degree of protection(IP 66)	Pass
29.4	Ex marking for explosive gas atmospheres	Ex db IIC T6 Gb	Pass
29.5	Ex marking for explosive dust atmospheres	Ex tb IIIC T80℃ Db	Pass
29.6	Combined types (or levels) of protection	This equipment is not combined types protection.	N/A
29.7	Multiple types of protection	This equipment has two type of protection, “db” & “tb”. Ex db IIC T6 Gb Ex tb IIIC T80℃ Db	Pass
29.8	Ga equipment using two independent Gb types (or levels) of protection	This is not applicable.	N/A
29.9	Boundary wall	This is not applicable.	N/A

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
29.10 **DS 2004/006A** **DS 2012/006A** **DS 2012/008**	Ex Components	This equipment is not Ex component.	N/A
29.11	Small Ex Equipment and small Ex Components	This equipment is not small Ex equipment and small Ex component.	N/A
29.12	Extremely small Ex Equipment and extremely small Ex Components	This equipment is not extremely small Ex equipment and extremely small Ex component.	N/A
29.13	Warning markings	1) “Do not open when an explosive atmosphere is present”, Clause 6.3 2) “Use wet cloth for cleaning and handling”, Clause 7.4.3 3) “Cable & cable gland suitable for at least 75℃ shall be used.”, Clause z16.6	Pass
29.14	Cells and batteries	This equipment has not cell and battery.	N/A
29.15	Electric machines operated with a converter	This equipment is not an electric machine.	N/A
29.16	Examples of marking	Ex db IIC T6 Gb Ex tb IIIC T80℃ Db IP66	Pass
30 **DS 2021/006**	Instructions		
30.1	General	The instructions provide the necessary information in accordance with this clause.	Pass
30.2	Cells and batteries	This equipment has not cell and battery	N/A
30.3	Electrical machines	This equipment is not an electric machine.	N/A
30.4	Ventilating fans	This equipment is not a ventilating fan,	N/A
30.5	Cable glands	This equipment is not a cable gland.	N/A

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict

Annex A (Normative) **DS 2017/001**	Supplementary requirements for cable glands		
A.1	General	This equipment is not a cable gland.	N/A
A.2	Constructional requirements		
A.2.1	Cable sealing	See clause Annex A.1.	N/A
A.2.2	Filling compounds	See clause Annex A.1.	N/A
A.2.3	Clamping		
A.2.3.1	General	See clause Annex A.1.	N/A
A.2.3.2	Group II or III cable glands	See clause Annex A.1.	N/A
A.2.4	Lead-in of cable		
A.2.4.1	Sharp edges	See clause Annex A.1.	N/A
A.2.4.2	Point of entry	See clause Annex A.1.	N/A
A.2.5	Released by a tool	See clause Annex A.1.	N/A
A.2.6	Fixing	See clause Annex A.1.	N/A
A.2.7	Degree of protection	See clause Annex A.1.	N/A
A.3	Type tests		
A.3.1	Tests of clamping of non-armoured and braided cables		
A.3.1.1	Cable glands with clamping by the sealing ring	See clause Annex A.1.	N/A
A.3.1.2	Cable glands with clamping by filling compound	See clause Annex A.1.	N/A
A.3.1.3	Cable glands with clamping by means of a clamping device	See clause Annex A.1.	N/A
A.3.1.4	Clamping test	See clause Annex A.1.	N/A
A.3.1.5	Mechanical strength	See clause Annex A.1.	N/A
A.3.2	Tests of clamping of armoured cables		
A.3.2.1	Tests of clamping where the armourings are clamped by a device integral to the gland		
A.3.2.1.1	General	See clause Annex A.1.	N/A
A.3.2.1.2	Clamping test	See clause Annex A.1.	N/A
A.3.2.1.3	Mechanical strength	See clause Annex A.1.	N/A
A.3.2.2	Tests of clamping where the armourings are not clamped by a device integral to the gland	See clause Annex A.1.	N/A
A.3.3	Type test for resistance to impact	See clause Annex A.1.	N/A
A.3.4 **DS 2019/005**	Test for degree of protection (IP) of cable glands	See clause Annex A.1.	N/A
A.4	Marking		

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
A.4.1	Marking of cable glands	See clause Annex A.1.	N/A
A.4.2	Identification of cable-sealing rings	See clause Annex A.1.	N/A
A.5	Instructions	See clause Annex A.1.	N/A

Annex B (Normative)	Requirements for Ex Components		
Table B.1	Applicability of clauses to Ex Components	This equipment is not an Ex Component.	N/A

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

Annex D (Informative)	Electric machines connected to converters

Annex E (Informative)	Temperature evaluation of electric machines

Annex F (Informative)	Guideline flowchart for tests of non-metallic enclosures or non-metallic parts of enclosures (26.4)

Annex G (Informative)	Guidance flowchart for tests of cable glands

Annex H (Informative)	Shaft voltages resulting in motor bearing or shaft brush sparking Discharge energy calculation

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

- N/A.

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

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Date of issue..... :	2023.07.17.
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Applicant's name ..... :	Honeywell Co., Ltd.
Address ..... :	28, 2Gongdan 2-ro, Seobuk-gu, Cheonan-si Chungcheongnam-do, Korea, Republic of
Standard ..... :	IEC 60079-1:2014, 7th Edition
Test procedure ..... :	IECEx System
Test Report Form Number..... :	ExTR60079-1-7C-DS (released 2022-07)

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, ISO, ISO/IEC or IEC/IEEE Ex standard or technical specification. 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.

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
1	Scope		
2 DS2010/006A	Normative references		
3 DS 2015/015	Terms and definitions		
4	Level of protection (equipment protection level, EPL)		
4.1	General	This equipment is level of protection “db” (EPL “Gb”)	Pass
4.2 DS2015/016A	Requirements for level of protection “da”	See clause 4.1	N/A
4.3	Requirements for level of protection “db”	This equipment is level of protection “db” (EPL “Gb”)	Pass
4.4	Requirements for level of protection “dc”		
4.4.1	General	See clause 4.1	N/A
4.4.2	Construction of “dc” devices		
4.4.2.1	General	See clause 4.1	N/A
4.4.2.2	Free internal volume	See clause 4.1	N/A
4.4.2.3	Seal protection	See clause 4.1	N/A
4.4.2.4	Continuous operating temperature (COT) requirements	See clause 4.1	N/A
4.4.2.5	Ratings	See clause 4.1	N/A
4.4.3	Tests for “dc” devices	See clause 4.1	N/A
5	Flameproof joints		

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
5.1	General requirements	All joints are threaded joints in this equipment. Joints comply with the requirements in Clause 5 and the design of the joints is appropriate to the mechanical constraints applied to them. The specific conditions of use are listed on the certificate and in the instructions detail, specific guidance noted to contact the original manufacturer for information on the dimensions of the flameproof joints. The joint surfaces are not coated with paint powder-coat finish or electroplated.	Pass
5.2 **DS 2015/018**	Non-threaded joints		
5.2.1	Width of joints (*L*)	All joints consist of threaded joints in this equipment.	N/A
5.2.2	Gap (*i)*	See clause 5.2.1	N/A
5.2.3 **DS 2015/018**	Spigot joints	See clause 5.2.1	N/A
5.2.4	Holes in joint surfaces		
5.2.4.1	General	See clause 5.2.1	N/A
5.2.4.2	Flanged joints with holes outside the enclosure (see Figures 3 and 5)	See clause 5.2.1	N/A
5.2.4.3	Flanged joints with holes inside the enclosure (see Figure 4)	See clause 5.2.1	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)	See clause 5.2.1	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)	See clause 5.2.1	N/A
5.2.5	Conical joints	See clause 5.2.1	N/A
5.2.6	Joints with partial cylindrical surfaces (not permitted for Group IIC)	See clause 5.2.1	N/A
5.2.7	Flanged joints for acetylene atmospheres	See clause 5.2.1	N/A
5.2.8	Serrated joints	See clause 5.2.1	N/A
5.2.9	Multi-step joints	See clause 5.2.1	N/A

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
5.3	Threaded joints	There are two threaded joints. One is between the face plate and the cover. The other one is cable entry. There are two types of entries, and three sizes are available for each type. And all joints comply tolerance grade of the thread: 6g/6H(ISO 965-1, 965-3) The thread complies with the requirements of tables 4 and 5 of IEC 60079-1. a) Between the face plate and the cover - M110(pitch: 2.0mm) - Threads engaged: 5 - Depth of engagement: 12.5mm b) type: NPT thread(3/8”, 1/2”, 3/4”) c) type: Metric thread(M16, M20, M25, pitch: 1.5)	Pass
5.4	Gaskets (including O-rings)	A gasket(O-ring) exists between the face plate and the cover.	Pass
5.5	Equipment using capillaries	This equipment does not use capillaries.	N/A
6	Sealed joint		
6.1 DS 2015/015 DS 2020/005	Cemented joints		
6.1.1	General	The cemented joint directly adheres between the enclosure and the glass. It is impossible to separate. Detailed information on the cemented joint is included in the manufacturer's document.	Pass
6.1.2	Mechanical strength	The lock nut is installed on the back side of the glass for the mechanical strength of the cemented joint. An overpressure test was conducted on four samples, and there was no sign of leakage.	Pass
6.1.3	Width of cemented joints	The volume of this equipment is more than 100cm^3, and the width of the cemented joint is more than 10mm. (Width: 10.1mm)	Pass
6.2	Fused glass joints		
6.2.1	General	This equipment has no fused glass.	N/A
6.2.2	Width of fused glass joints	See clause 6.2.1.	N/A
7	Operating rods	This equipment has no operating rods.	N/A

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
8	Supplementary requirements for shafts and bearings		
8.1	Joints of shafts		
8.1.1	General	This equipment has no joints of shafts.	N/A
8.1.2	Cylindrical joints	See clause 8.1.1.	N/A
8.1.3	Labyrinth joints	See clause 8.1.1.	N/A
8.1.4	Joints with floating glands	See clause 8.1.1.	N/A
8.2	Bearings		
8.2.1	Sleeve Bearings	This equipment has no bearings.	N/A
8.2.2	Rolling-element bearings	See clause 8.2.1.	N/A
9	Light-transmitting parts	There is only glass in this equipment.	N/A
10	Breathing and draining devices which form part of a flameproof enclosure		
10.1	General	This equipment has no breathing or draining devices.	N/A
10.2	Openings for breathing or draining	See clause 10.1.	N/A
10.3	Composition limits	See clause 10.1.	N/A
10.4	Dimensions	See clause 10.1.	N/A
10.5	Elements with measurable paths	See clause 10.1.	N/A
10.6	Elements with non-measurable paths	See clause 10.1.	N/A
10.7	Removable devices		
10.7.1	General	See clause 10.1.	N/A
10.7.2	Mounting arrangements of the elements	See clause 10.1.	N/A
10.8	Mechanical strength	See clause 10.1.	N/A
10.9	Breathing devices and draining devices when used as Ex components		

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
10.9.1	General	See clause 10.1.	N/A
10.9.2	Mounting arrangements of the elements and components	See clause 10.1.	N/A
10.9.3	Type tests for breathing and draining devices used as Ex components		
10.9.3.1	General	See clause 10.1.	N/A
10.9.3.2	Thermal tests		
10.9.3.2.1	General	See clause 10.1.	N/A
10.9.3.2.2	Test procedure	See clause 10.1.	N/A
10.9.3.2.3	Acceptance criteria	See clause 10.1.	N/A
10.9.3.3	Test for non-transmission of an internal ignition		
10.9.3.3.1	General	See clause 10.1.	N/A
10.9.3.3.2	Test procedure	See clause 10.1.	N/A
10.9.3.3.3	Acceptance criteria	See clause 10.1.	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	See clause 10.1.	N/A
10.9.3.4.2	Acceptance criteria	See clause 10.1.	N/A
10.9.4	Ex component certificate	See clause 10.1.	N/A
11	Fasteners and openings		
11.1	Type of fastener	This equipment does not use a fastener. It uses hex socket set screws for threaded covers only.	N/A
11.2	Plastic material or light alloys	This is not applicable.	N/A
11.3	Yield stress	This is not applicable.	N/A
11.4	Studs	This is not applicable.	N/A
11.5	Fasteners through walls	This is not applicable.	N/A
11.6 DS 2018/003	Blind holes	This is not applicable.	N/A
11.7 DS 2015/006	Screws into blind holes	The hole for the screw for grounding and the screw for fixing the nameplate is at least 1/3 of the nominal diameter and at least 3mm.	Pass
11.8	Closing of through holes	This is not applicable.	N/A

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
11.9	Separate fastening arrangements for threaded doors/covers	This equipment uses hex socket set screws for threaded cover.	Pass
12 DS 2012/004	Materials		
12.1	Tests prescribed by Clauses 14 to 16	The enclosure of this equipment satisfies the tests of clauses 14 to 16.	Pass
12.2	Assembly of multiple flameproof enclosures	This is not applicable.	N/A
12.3	Intercommunicating enclosure compartments	This is not applicable.	N/A
12.4	Use of cast iron	This is not applicable.	N/A
12.5	Use of liquids	This is not applicable.	N/A
12.6	Insulating materials for Group I apparatus	This equipment is not intended for Group I	N/A
12.7	Zinc content	This equipment's all parts of the enclosure contain zinc under 1 %.	Pass
12.8	Copper or copper alloys in explosive gas atmospheres containing acetylene	This equipment is used in an acetylene atmosphere. The body of this equipment is not constructed of copper or copper alloys. But this equipment has a purge air inlet plug, and one of the materials is brass. The content of copper is 58.03% For specific information refer to the data sheet.	Pass
13	Entries for flameproof enclosures		
13.1	General	This equipment has one entry hole. There are two types of entry holes. One is a metric threaded hole. The other is an NPT threaded hole.	Pass
13.2	Threaded holes	Metric female threads have tolerance grade 6H (ISO-951, ISO-953), and NPT female threads satisfy Table 5 of IEC 60079-1.	Pass

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
13.3	Non-threaded holes (for Group I only)	This equipment is not intended for Group I.	Pass
13.4	Cable glands	This equipment uses only certified cable glands.	N/A
13.5	Conduit sealing devices		
13.5.1	Conduit sealing devices, whether integral or separate,	This equipment does not use conduit sealing devices.	N/A
13.5.2	Permitted for Group II only	See clause 13.5.1.	N/A
13.5.3	Sealing device such as a stopping box with setting compound	See clause 13.5.1.	N/A
13.6	Plugs and sockets and cable couplers		
13.6.1	Construction & mounting	This equipment does not use plugs, sockets, and cable couplers.	N/A
13.6.2	Flameproof joints of contact parts	See clause 13.6.1.	N/A
13.6.3	Flameproof properties in the event of internal explosion	See clause 13.6.1.	N/A
13.6.4	Not connected to an interlocking switch	See clause 13.6.1.	N/A
13.6.5	Exemption & warning label	See clause 13.6.1.	N/A
13.7 **DS 2020/005**	Bushings	This equipment does not use bushings.	N/A
13.8	Blanking elements	This equipment does not use blanking elements.	N/A
14	Verification and tests	The determination of the maximum surface temperature specified in IEC 60079-0 is made under the conditions defined in Table 6 of this standard. However, this equipment has no applicable conditions.	N/A
15	Type tests		

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
15.1	General	Four samples were used. Sample 1: C7035C1000-N(Has internal parts) Sample 2: C7061F1011-N(Has internal parts) Sample 3: Empty enclosure Sample 4: Empty enclosure Tests were conducted successfully and carried out in the following sequence. 1. Determination of explosion pressure - Sample 1 and sample 2 were used. 2. Overpressure test - All samples were used. There were no signs of leakage in the cemented joint. 3. Test for non-transmission of an internal ignition - Sample 1 was used.	Pass
15.2	Tests of ability of the enclosure to withstand pressure		
15.2.1 DS 2021/003	General	This equipment was tested following clauses 15.2.2 and 15.2.3. After these tests, no permanent deformation or damage was invalidating the type of protection. The joint was not permanently enlarged.	Pass
15.2.2 DS 2022/002	Determination of explosion pressure (reference pressure)		
15.2.2.1	General	This equipment is designed for a temperature range of -20 °C to 70 °C. Therefore, the reference pressure was measured at room temperature.	Pass
15.2.2.2	Test procedure	This equipment is intended to be used in the Group IIC atmosphere. Five tests with (14±1)%C2H2 and five tests with (31±1)%H2 were conducted. Samples 1 & 2 were used. The reference pressure of each sample was measured twice by changing the position of the pressure sensor. The maximum reference pressure is 7.67 bar (Measured on sample 2, the pressure sensor and ignition source are in the middle)	Pass
15.2.2.3	Rotating electrical machines	This equipment is not rotating electrical machines.	N/A
15.2.2.4	Pressure-piling	This equipment is intended for Group IIC	N/A
15.2.2.5	Apparatus intended for use in a single gas	This equipment is not intended for use on single gas.	N/A
15.2.3	Overpressure test		
15.2.3.1	General	The overpressure test was conducted with clause 15.2.3.2.	Pass

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
15.2.3.2	Overpressure test - First method (static)	An overpressure test was conducted at 4 times the reference pressure with an enclosure that does not apply the routine test. - Test pressure: 7.67 bar X 4 = 30.68 bar - Test duration: At least 10 sec	Pass
15.2.3.3	Overpressure test - Second method (dynamic)	This equipment was conducted by overpressure test - First method (static).	N/A
15.3	Test for non-transmission of an internal ignition		
15.3.1	General	The equipment is intended for use in Group IIC. This equipment conforms to tolerance 6g/6H (ISO 965-1 and ISO 965-3) for cylindrical, threaded fit quality. Also, for entry, this equipment complies with tolerance 6H (ISO 965-1 and ISO 965-3) for cylindrical thread hole quality and uses NPT threads hole. Before doing the test for non-transmission of an internal ignition, the gasket was removed. In order to check the explosion-proof performance with only the threaded joint, three additional holes were machined for fixing the hexagon socket set screws, and the test was conducted without mounting screws.	Pass
15.3.2	Electrical equipment of groups I, IIA and IIB		
15.3.2.1	Test gap and test gas	This equipment is not intended for groups I, IIA, and IIB.	N/A
15.3.2.2	Increasing of gaps for test	This equipment has only threaded joint.	N/A
15.3.2.3	Number of tests and acceptance criterion	See clause 15.3.2.1.	N/A
15.3.3	Electrical apparatus of group IIC		
15.3.3.1	General	This equipment was tested following clause 13.3.3.2.	Pass
15.3.3.2	First method – Testing by increased test gap	Because this equipment has only threaded joint, Five tests was conducted with (27,5 ±1,5)% hydrogen and (7,5±1,0)% acetylene. The ignition is not transmitted to the test chamber.	Pass
15.3.3.3	Second method – Testing by increased pressure	See clause 15.3.3.1.	N/A
15.3.3.4	Third method – Testing by oxygen enrichment of test gases	See clause 15.3.3.1.	N/A
15.3.3.5	Number of tests for single piece production	This equipment is not single piece production.	N/A
15.4	Tests of flameproof enclosures with breathing and draining devices		

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
15.4.1	General	This equipment has no breathing and draining devices.	N/A
15.4.2	Tests of ability of the enclosure to withstand pressure		
15.4.2.1	General	See clause 15.4.1.	N/A
15.4.2.2	Replacement of breathing and draining devices	See clause 15.4.1.	N/A
15.4.2.3	Overpressure test	See clause 15.4.1.	N/A
15.4.3	Thermal tests		
15.4.3.1	Test procedure	See clause 15.4.1.	N/A
15.4.3.2	Acceptance criterion	See clause 15.4.1.	N/A
15.4.4	Tests for non-transmission of an internal ignition		
15.4.4.1	General	See clause 15.4.1.	N/A
15.4.4.2	Test procedure	See clause 15.4.1.	N/A
15.4.4.3	Non-transmission test for breathing and draining devices		
15.4.4.3.1	General	See clause 15.4.1.	N/A
15.4.4.3.2	Method A – Testing by increased pressure	See clause 15.4.1.	N/A
15.4.4.3.3	Method B – Testing by oxygen enrichment of test gases	See clause 15.4.1.	N/A
15.4.4.4	Acceptance criterion	See clause 15.4.1.	N/A
15.5	Tests for “dc” devices		
15.5.1	General	This equipment is a “db” device.	N/A
15.5.2 DS 2015/008	Preparation of “dc” samples	See clause 15.5.1.	N/A
15.5.3	Test conditions for “dc” devices		
15.5.3.1	General	See clause 15.5.1.	N/A
15.5.3.2	Test procedure	See clause 15.5.1.	N/A
16	Routine tests		
16.1	General		
16.1.1	Overview	An overpressure test was conducted at 4 times the reference pressure with an enclosure that does not apply the routine test.	N/A
16.1.2	Routine overpressure test – first method	See clause 16.1.2.	N/A
16.1.3	Routine test – second method	See clause 16.1.2.	N/A

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Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
16.1.4	Routine test – empty enclosure & parts of enclosure	See clause 16.1.2.	N/A
16.2 DS 2015/015	Enclosures not incorporating a welded construction	This is not applicable.	N/A
16.3 DS 2015/015	Enclosures incorporating a welded construction	This is not applicable.	N/A
16.4	Bushings not specific to one flameproof enclosure	This is not applicable.	N/A
16.5 DS 2021/003	Acceptance criteria	This is not applicable.	N/A
16.6	Batch testing	This is not applicable.	N/A
17	Switchgear for Group I		
17.1	General	This equipment is not intended for Group I	N/A
17.2	Means of isolation		
17.2.1	General	See clause 17.1.	N/A
17.2.2	Fitted inside Ex d enclosure	See clause 17.1.	N/A
17.2.3	Fitted inside another enclosure	See clause 17.1.	N/A
17.2.4	Plug and socket or a cable coupler – Compliance with 13.3	See clause 17.1.	N/A
17.3	Doors or covers		
17.3.1	Quick-acting doors or covers	See clause 17.1.	N/A
17.3.2	Doors or covers fixed by screws	See clause 17.1.	N/A
17.3.3	Threaded doors or covers	See clause 17.1.	N/A
18	Lampholders and lamp caps		
18.1	General	This equipment has no lampholders and lamp caps.	N/A

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
18.2	Device preventing lamps working loose	See clause 18.1.	N/A
18.3	Holders and caps for lamps with cylindrical caps		
18.3.1	Holders and caps for tubular fluorescent lamps	See clause 18.1.	N/A
18.3.2	Other holders	See clause 18.1.	N/A
18.4	Holders for lamps with threaded caps		
18.4.1	Resistant to corrosion	See clause 18.1.	N/A
18.4.2	Contact separation	See clause 18.1.	N/A
18.4.3	E26/E27 and E39/E40 threaded lampholders	See clause 18.1.	N/A
19	Non-metallic enclosures and non-metallic parts of enclosures		
19.1	General	This equipment has a non-metallic part of the enclosure. However, this clause does not apply because it is a cemented joint to which clause 6 applies according to b).	N/A
19.2	Resistance to tracking and creepage distances on internal surfaces of the enclosure walls	See clause 19.1.	N/A
19.3	Requirements for type tests	See clause 19.1.	N/A
19.4	Test of erosion by flame	See clause 19.1.	N/A
20	MARKING		
20.1	General	This equipment is marked according to IEC 60079-0, additionally marked with "db".	Pass
20.2	Caution and warning markings	In the manual, the warning mark of item is displayed. “Do not open when an explosive atmosphere is present.”	Pass
20.3	Informative markings	Additional information such as “The C7061F and C7035C series must be operated only within the technical limits that apply to it” is indicated.	Pass

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
21	Instructions	The manufacturer provides instructions for the use required by IEC 60079-0, which also includes information on the flame path.	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	This equipment has no breathing or draining devices.	N/A
A.2	Path dimensions	See clause Annex A.1.	N/A
A.3	Annex B requirements	See clause Annex A.1.	N/A
A.4	Type tests	See clause Annex A.1.	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	This equipment has no breathing or draining devices.	N/A
B.1.2	Bubble test pore size	See clause Annex B.1.1.	N/A
B.1.3	Density	See clause Annex B.1.1.	N/A
B.1.4	Open porosity and/or fluid permeability	See clause Annex B.1.1.	N/A
B.1.5	Identification	See clause Annex B.1.1.	N/A
B.2	Pressed metal wire elements		
B.2.1	Construction	See clause Annex B.1.1.	N/A
B.2.2	Specifications	See clause Annex B.1.1.	N/A
B.2.3	Bubble test pore size	See clause Annex B.1.1.	N/A
B.2.4	Density	See clause Annex B.1.1.	N/A
B.2.5	Open porosity and or fluid permeability	See clause Annex B.1.1.	N/A
B.2.6	Identification	See clause Annex B.1.1.	N/A
B.3	Metal foam elements		
B.3.1	Construction	See clause Annex B.1.1.	N/A
B.3.2	Chromium content	See clause Annex B.1.1.	N/A
B.3.3	Bubble test pore size	See clause Annex B.1.1.	N/A
B.3.4	Density	See clause Annex B.1.1.	N/A
B.3.5	Open porosity and/or fluid permeability	See clause Annex B.1.1.	N/A
B.3.6	Identification	See clause Annex B.1.1.	N/A
Annex C (Normative)	Additional requirements for flameproof entry devices		

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
C.1	General	This equipment must be used only one Ex-certified cable glands for entry.	N/A
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	See clause Annex C.1.	N/A
C.2.1.1.2	Cable glands with only one specific elastomeric sealing ring	See clause Annex C.1.	N/A
C.2.1.2	Cable glands sealed with setting compound	See clause Annex C.1.	N/A
C.2.1.3	Conduit sealing devices with setting compound	See clause Annex C.1.	N/A
C.2.1.4 DS 2020/005	Bushings	See clause Annex C.1.	N/A
C.2.2	Flameproof joints	See clause Annex C.1.	N/A
C.2.2.1	Threaded joints	See clause Annex C.1.	N/A
C.2.2.2	Non-threaded joints (Group I only)	See clause Annex C.1.	N/A
C.2.3	Constructional requirements for Ex blanking elements		
C.2.3.1	General requirements	See clause Annex C.1.	N/A
C.2.3.2	Metric Ex blanking elements	See clause Annex C.1.	N/A
C.2.3.3	NPT Ex blanking elements	See clause Annex C.1.	N/A
C.2.3.4	Non-threaded Ex blanking elements (Group I only)	See clause Annex C.1.	N/A
C.2.4	Constructional requirements for Ex thread adapters		
C.2.4.1	Compliance of threads	See clause Annex C.1.	N/A
C.2.4.2	Threads co-axial	See clause Annex C.1.	N/A
C.2.4.3	Length and internal volume	See clause Annex C.1.	N/A
C.3	Type tests		
C.3.1	Sealing test		
C.3.1.1	General	See clause Annex C.1.	N/A
C.3.1.2	Cable glands and conduit sealing devices with sealing ring	See clause Annex C.1.	N/A
C.3.1.3	Cable glands sealed with setting compound	See clause Annex C.1.	N/A
C.3.1.4	Conduit sealing devices sealed with setting compound	See clause Annex C.1.	N/A
C.3.2	Test of mechanical strength		
C.3.2.1	Cable glands with a threaded compression element	See clause Annex C.1.	N/A

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Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
C.3.2.2	Cable glands with a compression element fixed by screws	See clause Annex C.1.	N/A
C3.2.3	Cable glands sealed with setting compound	See clause Annex C.1.	N/A
C3.2.4	Acceptance criteria	See clause Annex C.1.	N/A
C.3.3	Type tests for Ex blanking elements		
C.3.3.1	Torque test	See clause Annex C.1.	N/A
C.3.3.2	Over-pressure test	See clause Annex C.1.	N/A
C.3.4	Type tests for Ex thread adapters		
C.3.4.1	Torque test	See clause Annex C.1.	N/A
C.3.4.2	Impact test	See clause Annex C.1.	N/A
C.3.4.3	Over-pressure test	See clause Annex C.1.	N/A
Annex D (Normative)	Empty flameproof enclosures as Ex components		
D.1	General	This equipment is not empty flameproof enclosures as Ex components.	N/A
D.2	Introductory remarks	See clause Annex D.1.	N/A
D.3	Ex component enclosure requirements		
D.3.1	Compliance with IEC 60079-0 & 60079-1	See clause Annex D.1.	N/A
D.3.2	Geometry of enclosure	See clause Annex D.1.	N/A
D.3.3	Rotating machines	See clause Annex D.1.	N/A
D.3.4	Means of mounting	See clause Annex D.1.	N/A
D.3.5	Drilled holes	See clause Annex D.1.	N/A
D.3.6	Reference pressure	See clause Annex D.1.	N/A
D.3.7	Overpressure	See clause Annex D.1.	N/A
D.3.8	Marking internally	See clause Annex D.1.	N/A
D.3.9	External marking provision	See clause Annex D.1.	N/A
D.3.10	Information in certificate	See clause Annex D.1.	N/A
D.4	Utilization of an Ex component enclosure certificate to prepare an equipment certificate		
D.4.1	Procedure	See clause Annex D.1.	N/A
D.4.2	Application of the schedule of limitations	See clause Annex D.1.	N/A
Annex E (Normative)	Cells and batteries used in flameproof “d” enclosures		
E.1	Introductory remarks	This equipment has no cells or batteries.	N/A
E.2	Acceptable electrochemical systems	See clause Annex E.1.	N/A
E.3	General requirements for cells (or batteries) inside flameproof enclosures		

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Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
E.3.1	Restrictions	See clause Annex E.1.	N/A
E.3.2	Warning label	See clause Annex E.1.	N/A
E.3.3	Mounting	See clause Annex E.1.	N/A
E.3.4	Relative movement	See clause Annex E.1.	N/A
E.3.5	Verification before and after the tests of enclosures	See clause Annex E.1.	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	See clause Annex E.1.	N/A
E.4.1.2	Infallible components	See clause Annex E.1.	N/A
E.4.2	Prevention of cell polarity reversal or reverse charging by another cell in the same battery		
E.4.2.1	Additional protection	See clause Annex E.1.	N/A
E.4.2.2	Protection against polarity reversal or revere charging	See clause Annex E.1.	N/A
E.4.3	Prevention of inadvertent charging of a battery by other voltage sources in the enclosure	See clause Annex E.1.	N/A
E.5	Recharging of secondary cells inside flameproof enclosures		
E.5.1	Allowable cell type	See clause Annex E.1.	N/A
E.5.2	Charging condition and safety devices	See clause Annex E.1.	N/A
E.5.3	Reverse charging	See clause Annex E.1.	N/A
E.5.4	Additional safety device(s)	See clause Annex E.1.	N/A
E.5.5	Recharging within enclosure	See clause Annex E.1.	N/A
E.6	Rating of protection diodes and reliability of protection devices		
E.6.1	Voltage rating & compliance with E.4.2	See clause Annex E.1.	N/A
E.6.2	Voltage rating & compliance with E.4.3	See clause Annex E.1.	N/A
E.6.3	Current rating	See clause Annex E.1.	N/A
E.6.4	Safety integrity	See clause Annex E.1.	N/A

Annex F (Informative)	Mechanical properties for screws and nuts

Annex G (Normative) See also **DS 2019/003**	Additional requirements for flameproof enclosures with an internal source of release (containment system)		
G.1	General	This equipment is not intended for flameproof enclosures with an internal source of release (containment system).	N/A

IEC 60079-1			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
G.2	Release conditions		
G.2.1	No release	See clause Annex G.1.	N/A
G.2.2	Limited release of a gas or vapour	See clause Annex G.1.	N/A
G.2.3	Limited release of a liquid	See clause Annex G.1.	N/A
G.3	Design requirements for the containment system		
G.3.1	General design requirements	See clause Annex G.1.	N/A
G.3.2	Infallible containment system	See clause Annex G.1.	N/A
G.3.3	Containment system with a limited release	See clause Annex G.1.	N/A
G.4	Type tests for the containment system		
G.4.1	Overpressure test	See clause Annex G.1.	N/A
G.4.2	Leakage test for an infallible containment system	See clause Annex G.1.	N/A
G.4.3	Leakage test for a containment system with a limited release	See clause Annex G.1.	N/A
Annex H (Normative)	Requirements for machines with flameproof “d” enclosures fed from converters		
H.1	General	This equipment is not intended for machines with flameproof “d” enclosures fed from converters.	N/A
H.2	Construction requirements for bearings	See clause Annex H.1.	N/A
H.3	Temperature requirements	See clause Annex H.1.	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..... :	KR/KGS/ExTR23.0004/00
ExTR Free Reference Number ..... :	2022-0857501
Compiled by + signature (ExTL) .... :	Hyun-woo, Park
Reviewed by + signature (ExTL).... :	Jong-gyoon, Jun
Date of issue ..... :	2023.07.17.
Ex Testing Laboratory (ExTL) ..... :	KGS (Korea Gas Safety Corporation)
Address ..... :	1390 Wonjung-ro, Maengdong-myeon, Eumseong-gun, Chungcheongbuk-do, Korea, Republic of
Applicant's name..... :	Honeywell Co., Ltd.
Address ..... :	28, 2Gongdan 2-ro, Seobuk-gu, Cheonan-si Chungcheongnam-do, Korea, Republic of
Standard..... :	IEC 60079-31:2022, Edition 3.0
Test Report Form Number ..... :	ExTR60079-31_3A_DS (released 2022-04)
Related Amendments, Corrigenda or ISHs..... :	N/A

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.

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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	Ex tb IIIC T80℃ Db	Pass
4.2	Equipment groups and ingress protection	IP66	Pass
4.3	Requirements for Ex Equipment with Level of Protection “ta”		
4.3.1	Fault current	This equipment is level of protection “tb” (EPL “Db”)	N/A
4.3.2	Maximum surface temperature	See clause 4.3.1	N/A
4.3.3	Dust exclusion	See clause 4.3.1	N/A
4.3.4	Protective devices		
4.3.4.1	General	See clause 4.3.1	N/A
4.3.4.2	Thermal protective devices	See clause 4.3.1	N/A
4.3.4.3	Overcurrent protective devices	See clause 4.3.1	N/A
4.3.5	Supplementary internal enclosure	See clause 4.3.1	N/A
4.3.6	Cells and batteries	See clause 4.3.1	N/A
4.4	Requirements for Ex Equipment with Level of Protection “tb” and “tc”		
4.4.1	Fault current	This is not applicable.	N/A
4.4.2	Maximum surface temperature	The maximum surface temperature was measured at the equipment enclosure surface. Maximum surface temperature: 74.8°C	Pass
4.4.3	Dust exclusion	The test was conducted according to clause 6.1.1	Pass
4.4.4	Thermal protection		
4.4.4.1	General	This is not applicable.	N/A
4.4.4.2	Thermal protective devices	See clause 4.4.4.1	N/A
4.4.4.3	Overcurrent protective devices	See clause 4.4.4.1	N/A
4.4.5	Cells and batteries	This equipment does not have cells and batteries.	N/A
4.4.6	External plug and socket connections for field wiring connection	See clause 4.4.4.1	N/A
5	Construction		

IEC 60079-31			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
5.1	Joints		
5.1.1	General	This equipment satisfies clauses 5.1.2 and 5.1.6, and the test of clause 6.1.1 was conducted.	Pass
5.1.2	Threaded joints	This equipment has a parallel threaded joint of at least five threads between the face plate and the cover with a tolerance quality of medium according to ISO 965-1.	Pass
5.1.3	Gaskets and seals	This equipment has an O-ring between Face Plate and Cover. There are two types of O-rings. One is Viton 60 and the other is Silicone 60. All O-ring is one-piece continuous construction, that is with an uninterrupted periphery.	Pass
5.1.4	Cemented joints	This equipment has a cemented joint but it does not used on mating parts which need to be removed to gain access to field wiring connections or in-service adjusting facilities.	N/A
5.1.5	Operating rods, spindles and shafts	This is not applicable.	N/A
5.1.6	Windows		
5.1.6.1	Windows employing a cemented joint	This equipment has a window employing a cemented joint. It is cemented directly to the wall with the window of the enclosure so as to form an inseparable assembly.	Pass
5.1.6.2	Windows employing a gasket joint	This is not applicable.	N/A
5.2	Cable glands, cable transit devices and conduit sealing devices	This equipment only has an entry and uses only Ex-certified cable glands.	N/A
5.3	Entries		
5.3.1	Plain entries	This is not applicable.	N/A
5.3.2	Threaded entries	This equipment has one entry into the enclosure. Entry is the threaded hole located in the wall of the enclosure. There are two types of entries, and three sizes are available for each type. Details are following. a) type: NPT thread(3/8”, 1/2”, 3/4”) b) type: Metric thread(M16, M20, M25, pitch: 1.5)	Pass

6 See also **DS 2020/004**	Verification and tests
6.1	Type tests
6.1.1	Type tests for dust exclusion by enclosures

IEC 60079-31			
Clause	**Requirement – Test**	**Result – Remark**	**Verdict**
6.1.1.1	General	After conducting the tests of enclosures in accordance with IEC 60079-0, all of the samples were conducted test by the IP test of 6.1.1.4.	Pass
6.1.1.2	Impact test on supplementary internal enclosures	This equipment has not supplementary internal enclosure.	N/A
6.1.1.3	Pressure test	The equipment is designed so that the gasket(O-ring) does not physically move.	N/A
6.1.1.4	IP test	This equipment satisfies the IP grade IP6X according to IEC 60529.	Pass
6.1.2	Tests to determine maximum surface temperature	The maximum surface temperature was measured according to IEC-60079-0. Maximum surface temperature: 74.8°C	Pass
6.2	Routine tests		

7 See also **DS 2015/004** **DS 2015/010** **DS 2020/004**	Marking	This equipment is marked according to IEC 60079-0, additionally marked with "tb".	Pass

Annex A (Normative)	Supplementary requirements for entry devices		
A.1 **DS 2009/002**	General	This equipment is not entry device.	N/A
A.2	Construction requirements		
A.2.1	Cable glands, cable transit devices and conduit sealing devices	See clause Annex A.1.	N/A
A.2.2	Blanking elements and thread adapters	See clause Annex A.1.	N/A
A.3	Type tests		
A.3.1	Cable glands, cable transit devices and conduit sealing devices	See clause Annex A.1.	N/A
A.3.2	Blanking elements and thread adapters	See clause Annex A.1.	N/A
A.4	Marking	See clause Annex A.1.	N/A

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

N/A

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEx KGS 23.0004X** Page 1 of 3 Certificate history:

Status: **Current** Issue No: 0

Date of Issue: 2023-07-17

Applicant: **Honeywell Co., Ltd.**
28, 2gongdan 2-ro, Seobuk-gu
Cheonan-si, Chungcheongnam-do, 31075
Korea, Republic of

Equipment: **Explosion Proof Flame Detector / C7061F1011-N, C7035C1000-N**

Optional accessory:

Type of Protection: **Ex db, tb**

Marking: Ex db IIC T6 Gb IP66

Ex tb IIIC T80°C Db IP66

Ambient Temp.: - 20 °C ~ + 70 °C

Trade agent: Honeywell Co., Ltd.

Manufacture: ILSHIN Industrial Electric Co., Ltd.

Rating: 115 or 230 Vac, 50/60 Hz

Approved for issue on behalf of the IECEx Certification Body: **Changjoo Seo**

Position: **General Manager**

Signature:
(for printed version)

Date:
(for printed version)

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.

Certificate issued by:

Korea Gas Safety Corporation
1390 Wonjung-ro
Maengdong-myeon
Eumseong-gun
Chungcheongbuk-do
27738
Korea, Republic of

KOREA GAS SAFETY CORPORATION

IECEx Certificate of Conformity

Certificate No.: **IECEx KGS 23.0004X** Page 2 of 3

Date of issue: 2023-07-17 Issue No: 0

Manufacturer: **ILSHIN Industrial Electric Co., Ltd.**
200-1, Gwangju-daero
Gwangju-si Gyeonggi-do 12739
Korea, Republic of

Manufacturing locations:

ILSHIN Industrial Electric Co., Ltd.
200-1, Gwangju-daero
Gwangju-si Gyeonggi-do 12739
Korea, Republic of

ILSHIN Industrial Electric Co., Ltd.
26, Jungang-ro 349beon-gil
Gwangju-si, Gyeonggi-do 12738
Korea, Republic of

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements.This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :
The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-1:2014 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
Edition:7.0

IEC 60079-31:2022 Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure "t"
Edition:3.0

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:

KR/KGS/ExTR23.0004/00

Quality Assessment Report:

NL/DEK/QAR16.0004/03

IECEx Certificate of Conformity

EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

General product information:

The C7061F1011-N and C7035C1000-N are flame detectors for sensing the ultraviolet generated by the combustion of gas, oil, or other fuels. 61F is a self checking model including a shutter, and 35C is a non-self checking model without a shutter. This equipment must be used with Honeywell's burner controller, which is located outside the hazardous area.

Refer to **Annex** for burner controller types applicable depending on the flame detector.

Explosion Proof Flame Detector(C7061F1011-N, C7035C1000-N) is designed for use in a potentially explosive atmosphere of the gas group and dust group. The Ex grade is “Ex db IIC T6 Gb” and "Ex tb IIIC T80°C Db". The ambient temperature range is -20 °C ≤ Ta ≤ +70 °C. The enclosure is made of aluminum alloy and it has a threaded joint between the cover and the face plate. This equipment includes quartz glass, the epoxy that fixes the quartz glass, and the O-ring.

Routine tests:

N/A

(An overpressure test was conducted at 4 times the reference pressure with an enclosure that does not apply the routine test.)

SPECIFIC CONDITIONS OF USE: YES as shown below:

1. This equipment is designed for use in an ambient temperature range of -20 °C to +70 °C.
2. Contact the manufacturer for information on the dimensions of the flameproof joints.
3. When installing and using the equipment, follow the installation manual provided by the manufacturer and IEC 60079-14.
4. For entries, use Ex-certified cable glands only with a minimum IP degree in accordance with the marking.
5. The service temperature at the entry point is above 70°C. Users should check the appropriate cable entry device and cable selection guidelines
6. Potential electrostatic charging hazard - See instructions

Annex:

[Attachment] Annex to IECEx KGS 22.0004X Issue 0.pdf

Applicant	:	Honeywell Co., Ltd.
Address	:	28, 2Gongdan 2-ro, Seobuk-gu, Cheonan-si Chungcheongnam-do, Korea, Republic of
Electrical Apparatus	:	Explosion Proof Flame Detector / C7061F1011-N, C7035C1000-N

Technical information:

Applicable burner controller types depending on the frame detector are as bellows.

Models of burner controller	Models of equipment	
	C7061F1011-N	C7035C1000-N
7800 Series	O	O
R8001 Series	O	O
FDU510*3***** Series	X (These burner controllers are only for C7035C1000-N)	O
DBC1500/2000 Series		O
BC1000A*U Series		O

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