



IECEX TEST REPORT
IEC 60079-0

Explosive atmospheres – Part 0: Equipment – General requirements

ExTR Reference Number.....: CZ/FTZU/ExTR 14.0003/04
 ExTR Free Reference Number: 14 IECEx 0003/04
 Compiled by + signature (ExTL): Ing.Jiří Ambrož
 Reviewed by + signature (ExTL).....: Ing.Lukáš Martinák
 Date of issue: 01.02.2021

Ex Testing Laboratory (ExTL).....: Physical Technical Testing Institute, s.p
 Address: Pikartská 1337/7, 716 07 Ostrava-Radvanice, Czech Republic

Applicant's name.....: **Limatherm Components Sp. z o.o**
 Address: **ul. Żelazna 5, 41-506 Chorzów , Poland**

Standard.....: IEC 60079-0:2017, Edition 7.0
 Test procedure.....: IECEx System
 Test Report Form Number.....: ExTR60079-0_7B_DS (released 2018-01)
 Related Amendments, Corrigenda or ISHs: N/A

Copyright © 2018 International Electrotechnical Commission System for Certification to Standards Relating to Equipment for use in Explosive Atmospheres (IECEx System), Geneva, Switzerland. All rights reserved.

This blank publication may be reproduced in whole or in part for non-commercial purposes as long as the IECEx System is acknowledged as copyright owner and source of the material. The IECEx system takes no responsibility for, and will not assume liability for, damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

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 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
1	Scope		
2	Normative references		
3	Terms and definitions		
4	Equipment grouping		
4.1	General	See 4.3. and 4.4.	Pass
4.2	Group I	Not used	NA
4.3	Group II	IIC	Pass
4.4	Group III	IIIC	Pass
4.5	Equipment for a particular explosive gas atmosphere	Not used	NA
5 See also DS 2015/011A	Temperatures		
5.1	Environmental influences		
5.1.1	Ambient temperature	The empty enclosure is applicable for electrical apparatus, designed for ambient temperature not exceeding following range:a) the connection head -50°C to +150°C – without window,-50°C to +85°C – with window; b) the field transmitter housing:-50°C to +60°C with and without window;	Pass
5.1.2	External source of heating or cooling	Not used	NA

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
5.2	Service temperature	<u>According to used o-ring</u> <u>XD-A.. series:</u> -40°C to +100°C (TPE rubber) -50°C to +150°C (VMQ rubber) -20°C to +200°C (FKM rubber) <u>XD-A...win series</u> -40°C to +85°C (TPE rubber) -50°C to +85°C (VMQ rubber) -20°C to +85°C (FKM rubber)	Pass

5.3	Maximum surface temperature		
5.3.1	Determination of maximum surface temperature	Not used	NA
5.3.2	Limitation of maximum surface temperature		
5.3.2.1	Group I electrical equipment	Not used	NA
5.3.2.2	Group II electrical equipment	Shall be verified in final instalation	NA
5.3.2.3	Group III electrical equipment		
5.3.2.3.1	Maximum surface temperature for EPL Da	Not used	NA
5.3.2.3.2	Maximum surface temperature for EPL Db	Shall be verified in final instalation	NA
5.3.2.3.3	Maximum surface temperature determined without a layer of dust for EPL Dc	Not used	NA
5.3.3	Small component temperature for Group I or Group II electrical equipment	Not used	NA
5.3.4	Component temperature of smooth surfaces for Group I or Group II electrical equipment	Not used	NA

6	Requirements for all electrical equipment		
---	---	--	--

6.1	General	+IEC EN 60079-1 and IEC EN 60079-31	Pass
-----	---------	-------------------------------------	------

6.2	Mechanical strength of equipment	See 26.4. without protected guard	Pass
-----	----------------------------------	-----------------------------------	------

6.3	Opening times	Not used – U-component	NA
-----	---------------	------------------------	----

6.4	Circulating currents in enclosures (e.g. of large electric machines)	Not used	NA
-----	--	----------	----

6.5	Gasket retention	o-rings in groove	NA
-----	------------------	-------------------	----

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
6.6	Electromagnetic and ultrasonic energy radiating equipment		
6.6.1	General	Not used	NA
6.6.2	Radio frequency sources	Not used	NA
6.6.3	Ultrasonic sources	Not used	NA
6.6.4	Lasers, luminaires, and other non-divergent continuous wave optical sources	Not used	NA
7	Non-metallic enclosures and non-metallic parts of enclosures		
7.1	General		
7.1.1	Applicability	o-rings of enclosure; cemented joint	Pass
7.1.2	Specification of materials		
7.1.2.1	General	o-rings of enclosure; cemented joint	Pass
7.1.2.2	Plastic materials	Not used	NA
7.1.2.3	Elastomers	o-ring -40°C to +100°C (TPE rubber) -50°C to +150°C (VMQ rubber) -20°C to +200°C (FKM rubber)	Pass
7.1.2.4	Materials used for cementing	Cemented joint - SYLGARD 567; COT : -50°C to +200°C	Pass
7.2	Thermal endurance		
7.2.1	Tests for thermal endurance	See 26.8.;26.9. according to 26.4.1.2.3.	Pass
7.2.2	Material selection	Gb; Db; COT \geq 20K+Ts	Pass
7.2.3	Alternative qualification of elastomeric sealing O-rings	Not used	NA
7.3	Resistance to ultraviolet light	Not used – used glass on surface enclosure	NA
7.4	Electrostatic charges on external non-metallic materials		
7.4.1	Applicability	See 7.4.2. and 7.4.3.	Pass
7.4.2	Avoidance of a build-up of electrostatic charge for Group I or Group II	Layer is max 0,2mm for group IIC	Pass
7.4.3	Avoidance of a build-up of electrostatic charge for Group III	See schedule of limitation in certificate	Pass
7.5	Attached external conductive parts	alluminium alloy 226, EN AC – AlSi9Cu3	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
8	Metallic enclosures and metallic parts of enclosures		
8.1	Material composition	aluminium alloy EN AC 44200 (AK11b) alternative EN AC 46000 (AK93)	Pass
8.2	Group I	Not used	NA
8.3	Group II	≤ 7,5 % in total of magnesium, titanium and zirconium	Pass
8.4	Group III	≤ 7,5 % in total of magnesium, titanium and zirconium	Pass
8.5	Copper Alloys	Not used	NA
9	Fasteners		
9.1	General	Only by tools	Pass
9.2	Special fasteners	Not used	NA
9.3	Holes for special fasteners		
9.3.1	Thread engagement	Not used	NA
9.3.2	Tolerance and clearance	Not used	NA
9.4	Hexagon socket set screws	Not used	NA
10	Interlocking devices	Not used	NA
11	Bushings	Not used	NA
12	(Reserved for future use)		
13 See also DS 2014/001	Ex Components		
13.1	General	According to Annex B; a) Empty enclosure	Pass
13.2	Mounting	Not used	NA

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
13.3	Internal mounting	Not used	NA
13.4	External mounting	Not used	NA
13.5	Ex Component certificate	See certificate U-component	Pass
14	Connection facilities		
14.1	General	Not used	NA
14.2	Type of protection	Not used	NA
14.3	Creepage and clearance	Not used	NA
15	Connection facilities for earthing or bonding conductors		
15.1	Equipment requiring earthing or bonding		
15.1.1	Internal earthing	earthing conductor – prepared for using	Pass
15.1.2	External bonding	earthing conductor – prepared for using on the side of enclosure	Pass
15.2	Equipment not requiring earthing	Not used	NA
15.3	Size of protective earthing conductor connection	Not used	NA
15.4	Size of equipotential bonding conductor connection	Not used	NA
15.5	Protection against corrosion	A2/Ni+Sn See drawing No.2-Z-L1983	Pass
15.6	Secureness of electrical connections	Used spring washer M5 See drawing No.2-Z-L1983	Pass
15.7	Internal earth continuity plate	Not used	NA
16	Entries into enclosures		

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
16.1	General	D1;D2;D3; See drawing No.2-Z-L1983	Pass
16.2	Identification of entries	See drawing No.2-Z-L1983 As alternative using type taper threads Rc ^{1/2} , Rc ^{3/4} , BSPT ^{1/2} , BSPT ^{3/4} and cylindrical threads G ^{1/2} , G ^{3/4} , G ^{3/8} , BSPP ^{1/2} , BSPP ^{3/4} , BSPP ^{3/8} for only process threaded joint D ₁ . see Application manual N-L2236	Pass
16.3	Cable glands	Shall be used only certified devices Ex db and min. IP6X	Pass
16.4	Blanking elements	Shall be used only certified devices Ex db and min. IP6X	Pass
16.5	Thread adapters	Not used	NA
16.6	Temperature at branching point and entry point	Not used	NA
16.7	Electrostatic charges of cable sheaths	Not used	NA
17	Supplementary requirements for electric machines		
17.1	General	Not used	NA
17.2	Ventilation		
17.2.1	Ventilation openings	Not used	NA
17.2.2	Materials for external fans	Not used	NA
17.2.3	Cooling fans of rotating electric machines	Not used	NA
17.2.3.1	Fans and fan hoods	Not used	NA
17.2.3.2	Construction and mounting of the ventilating systems	Not used	NA
17.2.3.3	Clearances for the ventilating system	Not used	NA
17.2.4	Auxiliary motor cooling fans	Not used	NA
17.2.5	Room ventilating fans		
17.2.5.1	Applicability	Not used	NA
17.2.5.2	General	Not used	NA
17.2.5.3	Fan and fan hoods	Not used	NA

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
17.2.5.4	Construction and mounting	Not used	NA
17.2.5.5	Clearances for rotating parts	Not used	NA
17.3	Bearings	Not used	NA
18	Supplementary requirements for switchgear		
18.1	Flammable dielectric	Not used	NA
18.2	Disconnectors	Not used	NA
18.3	Group I – Provisions for locking	Not used	NA
18.4	Doors and covers	Not used	NA
19	Reserved for future use		
20	Supplementary requirements for external plugs, socket outlets and connectors for field wiring connection		
20.1	General	Not used	NA
20.2	Explosive gas atmospheres	Not used	NA
20.3	Explosive dust atmospheres	Not used	NA
20.4	Energized plugs	Not used	NA
21	Supplementary requirements for luminaires		
21.1	General	Not used	NA
21.2	Covers for luminaires of EPL Mb, EPL Gb, or EPL Db	Not used	NA
21.3	Covers for luminaires of EPL Gc or EPL Dc	Not used	NA
21.4	Sodium lamps	Not used	NA

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
22	Supplementary requirements for caplights and handlights		
22.1	Group I caplights	Not used	NA
22.2	Group II and Group III caplights and handlights	Not used	NA
23	Equipment incorporating cells and batteries		
23.1	General	Not used	NA
23.2	Interconnection of cells to form batteries	Not used	NA
23.3	Cell types	Not used	NA
23.4	Cells in a battery	Not used	NA
23.5	Ratings of batteries	Not used	NA
23.6	Interchangeability	Not used	NA
23.7	Charging of primary batteries	Not used	NA
23.8	Leakage	Not used	NA
23.9	Connections	Not used	NA
23.10	Orientation	Not used	NA
23.11	Replacement of cells or batteries	Not used	NA
23.12	Replaceable battery pack	Not used	NA
24	Documentation	See list of documentation	Pass
25	Compliance of prototype or sample with documents	Compliance of sample with documents	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
26	Type tests		
26.1	General	+IEC EN 60079-0;-1 and -31	Pass
26.2	Test configuration	Not used – Empty enclosure Ex db	NA
26.3	Tests in explosive test mixtures	Not used	NA
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	-impact test - shock test of glass IP test IP6X - tests according to IEC EN 60079-1 and -31	Pass
26.4.1.2	Non-metallic enclosures or non-metallic parts of enclosures		
26.4.1.2.1	General	Cemented window to the cover of enclosure	Pass
26.4.1.2.2	Group I equipment	Not used	NA
26.4.1.2.3	Group II and Group III equipment	-Endurance to heat and cold -Impact test -IP test IP6X - adequate tests according to IEC EN 60079-1 and -31	Pass
26.4.2	Resistance to impact	– window ;E=1kg/0,4m - cover and enclosure – E= 1kg/0,7m Ta= -55°C –see 26.7.2	Pass
26.4.3	Drop test	Not used	NA
26.4.4	Acceptance criteria	Without damage	Pass
26.4.5 See also DS 2012/003	Degree of protection (IP) by enclosures		
26.4.5.1	Test procedure	Used IEC 60529; IP 6X; on request IP68	Pass
26.4.5.2	Acceptance criteria	Without dust and water inside of enclosure	Pass
26.5	Thermal tests		
26.5.1	Temperature measurement		
26.5.1.1	General	Not used	NA
26.5.1.2	Service temperature	Not used	NA
26.5.1.3	Maximum surface temperature	Not used	NA
26.5.2	Thermal shock test	Ta=150°C ; without damage of glass	Pass
26.5.3	Small component ignition test (Group I and Group II)		

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
26.5.3.1	General	Not used	NA
26.5.3.2	Procedure	Not used	NA
26.5.3.3	Acceptance criteria	Not used	NA

26.6	Torque test for bushings		
26.6.1	Test procedure	Not used	NA
26.6.2	Acceptance criteria	Not used	NA

26.7	Non-metallic enclosures or non-metallic parts of enclosures		
26.7.1	General	See 26.8. and 26.9.	Pass
26.7.2	Test temperatures	For impact test used 5K for minimum Tamb = -50°C; -40°C and -20°C	Pass

26.8	Thermal endurance to heat	– Silgard 567 Ta1=95°C; hum.=90% - 14 days Ta2=120°C – 14 days; - Seal VMQ Ta1=95°C; hum.=90% - 14 days Ta2= 170°C - 14 days - Seal FKM Ta1=95°C; hum.=90% - 14 days Ta2=220°C – 14 days - Seal TPE Ta1=95°C; hum.=90% - 14 days Ta2= 120°C - 14 days Without damage	Pass
------	---------------------------	--	------

26.9	Thermal endurance to cold	Ta3=-55°C 24 hours – Silgard 567 -seal VMQ Ta3=-55°C 24 hours - Seal FKM Ta3= -25°C – 24 hours - Seal TPE Ta3=-45°C 24 hours without damage	Pass
------	---------------------------	--	------

26.10	Resistance to UV light		
26.10.1	General		
26.10.2	Light exposure		
26.10.3	Acceptance criteria	Not used	NA

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
26.11	Resistance to chemical agents for Group I equipment	Not used	NA
26.12	Earth continuity	Not used	NA
26.13	Surface resistance test of parts of enclosures of non-metallic materials	Not used	NA
26.14	Measurement of capacitance		
26.14.1	General	Not used	NA
26.14.2	Test procedure	Not used	NA
26.15	Verification of ratings of ventilating fans	Not used	NA
26.16	Alternative qualification of elastomeric sealing O-rings	Not used	NA
26.17	Transferred charge test		
26.17.1	Test equipment	Not used	NA
26.17.2	Test sample	Not used	NA
26.17.3	Test procedure	Not used	NA
27	Routine tests	Overpressure test acc. cl. 15.2.3.1 of the standard EN 60079-1 It was carried out tests: - 4 times reference pressure - at maximum water pressure 65 bar - no routine test is required	NA
28	Manufacturer's responsibility		
28.1	Conformity with the documentation	Manufacturer's responsibility	NA
28.2	Certificate	Manufacturer's responsibility	NA
28.3	Responsibility for marking	Manufacturer's responsibility	NA
29	Marking		
29.1	Applicability	See ExTr IEC 60079-1 cl D3.8	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
29.2	Location	Inside of enclosure	Pass
29.3	General	See Application Manual N-L- 2236	Pass
29.4	Ex marking for explosive gas atmospheres	Ex db IIC Gb	Pass
29.5	Ex marking for explosive dust atmospheres	Ex tb IIIC Db	Pass
29.6	Combined types (or levels) of protection	Not used	NA
29.7	Multiple types of protection	Not used	NA
29.8	Ga equipment using two independent Gb types (or levels) of protection	Not used	NA
29.9	Boundary wall	Not used	NA
29.10	Ex Components	See certificate	Pass
29.11	Small Ex Equipment and small Ex Components	Not used	NA
29.12	Extremely small Ex Equipment and extremely small Ex Components	Not used	NA
29.13	Warning markings	Not used	NA
29.14	Cells and batteries	Not used	NA
29.15	Electric machines operated with a converter	Not used	NA
29.16	Examples of marking	Not used	NA
30	Instructions		

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
30.1	General	See list of documents	Pass
30.2	Cells and batteries	Not used	NA
30.3	Electrical machines	Not used	NA
30.4	Ventilating fans	Not used	NA
30.5	Cable glands	Not used	NA
Annex A (Normative)	Supplementary requirements for cable glands		
A.1	General	May be equipped only separately certified cable gland or plugs or adapters/reducers in Ex db Ex- protection and IP 68	NA
A.2	Constructional requirements		
A.2.1	Cable sealing	Not used	NA
A.2.2	Filling compounds	Not used	NA
A.2.3	Clamping		
A.2.3.1	General	Not used	NA
A.2.3.2	Group II or III cable glands	Not used	NA
A.2.4	Lead-in of cable		
A.2.4.1	Sharp edges	Not used	NA
A.2.4.2	Point of entry	Not used	NA
A.2.5	Released by a tool	Not used	NA
A.2.6	Fixing	Not used	NA
A.2.7	Degree of protection	Not used	NA
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	Not used	NA
A.3.1.2	Cable glands with clamping by filling compound	Not used	NA
A.3.1.3	Cable glands with clamping by means of a clamping device	Not used	NA
A.3.1.4	Clamping test	Not used	NA
A.3.1.5	Mechanical strength	Not used	NA
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	Not used	NA
A.3.2.1.2	Clamping test	Not used	NA

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
A.3.2.1.3	Mechanical strength	Not used	NA
A.3.2.2	Tests of clamping where the armourings are not clamped by a device integral to the gland	Not used	NA
A.3.3	Type test for resistance to impact	Not used	NA
A.3.4	Test for degree of protection (IP) of cable glands	Not used	NA
A.4	Marking		
A.4.1	Marking of cable glands	Not used	NA
A.4.2	Identification of cable-sealing rings	Not used	NA
A.5	Instructions	Not used	NA

Annex B (Normative)	Requirements for Ex Components		
Table B.1	Applicability of clauses to Ex Components	Used adequate clauses for U-component with Ex protection Ex db	Pass

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)	