Technical Construction File
EN IEC 60079-0:2018+A11:2024
Explosive atmospheres - Part 0: Equipment - General requirements
EN 60079-11:2012
Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

Report reference No..... :	TASH25080774249
Date of issue..... :	August 14,2025
Reviewing laboratory..... :	Shanghai Global Testing Services Co., Ltd.
Reviewing location..... :	Floor 3rd, Building D-1, No. 128, Shenfu Road, Minhang District, Shanghai, China.
Applicant..... :	Shanghai Chip Dance Co., Ltd.
Address..... :	Unit 06-08, 30th Floor, No. 150 Yaoyuan Road, China (Shanghai) Pilot Free Trade Zone
Manufacturer..... :	Shanghai Chip Dance Co., Ltd.
Address..... :	Unit 06-08, 30th Floor, No. 150 Yaoyuan Road, China (Shanghai) Pilot Free Trade Zone
Factory..... :	The same as manufacturer
Address..... :	The same as manufacturer
Standard..... :	EN IEC 60079-0:2018+A11:2024, EN 60079-11:2012
Review Report Form No..... :	60079
TRF originator..... :	GTS
Master TRF..... :	Reference No. EN IEC 60079-0, EN IEC 60079-11
Review procedure ..... :	GTS
Type of Review object..... :	ELECTRONIC DETONATOR CONTROL MODULES
Trademark..... :	/
Model/type reference..... :	CBECM-CM-01/02/03, CBECM-TB-01/02/03, CBECM-TS-01/02/03, CBECM-EB-01/02/03, CBECM-ES-01/02/03
Main Model..... :	CBECM-CM/TB/TS/EB
Rating..... :	Power Input: 8.5V~30V, 14uA~25uA Power Output:18V~22V, 2.25A~25A Extreme Voltage If with battery: High 30 V, Middle 16 V, Low 8.5 V

Possible review case verdicts:

- review case does not apply to the test object..... : N(.A.)
- review object does meet the requirement..... : P(ass)
- review object does not meet the requirement..... : F(ail)

General remarks:

”(see remark #)” refers to a remark appended to the report.

”(see appended table)” refers to a table appended to the report.

Throughout this report a comma is used as the decimal separator.

The review results presented in this report relate only to the object reviewed.

This report shall not be reproduced except in full without the written approval of the third party.

Reviewing:	
Date of receipt of review item:	August 04,2025
Date(s) of performance of review:	August 04,2025 August 14,2025

General product information:

ELECTRONIC DETONATOR CONTROL MODULES

Copy of marking plate

ELECTRONIC DETONATOR CONTROL MODULES, Model: CBECM-CM/TB/TS/EB Shanghai Chip Dance Co., Ltd.	Marking Ex II 2 G Ex ib IIC T4 Gb

EN 60079-0			
Clause	Requirement - Test	Result - Remark	Verdict
4	Equipment grouping		P
	Electrical equipment for explosive atmospheres is divided into the following groups:		---
4.1	Group I		N/A
	Electrical equipment of Group I is intended for use in mines susceptible to firedamp.		N/A
	Electrical equipment intended for mines where the atmosphere, in addition to firedamp, may contain significant proportions of other flammable gases, shall be constructed and tested in accordance with the requirements relating to Group I and also to the subdivision of Group II corresponding to the other significant flammable gases. This electrical equipment shall then be marked appropriately		N/A
4.2	Group II		P
	Electrical equipment of Group II is intended for use in places with an explosive gas atmosphere other than mines susceptible to firedamp.		P
	Electrical equipment of Group II is subdivided according to the nature of the explosive gas atmosphere for which it is intended.		---
	Group II subdivisions		---
	IIA, a typical gas is propane		P
	IIB, a typical gas is ethylene		P
	IIC, a typical gas is hydrogen	IIC	P
4.3	Group III		--
	Electrical equipment of Group III is intended for use in places with an explosive dust atmosphere other than mines susceptible to firedamp.	Not applicable to this area	N/A
	Electrical equipment of Group III is subdivided according to the nature of the explosive dust atmosphere for which it is intended.	Not applicable to this area	N/A
	Group III subdivisions:		N/A
	IIIA: combustible flyings		N/A
	IIIB: non-conductive dust		N/A
	IIIC: conductive dust		N/A
4.4	Equipment for a particular explosive atmosphere		P
	The electrical equipment may be tested for a particular explosive atmosphere. In this case,the information shall be recorded on the certificate and the electrical equipment marked accordingly.		N/A
5	Temperatures		P
5.1	Environmental influences		P
5.1.1	Ambient temperature		P
	Electrical equipment designed for use in a normal ambient temperature range of –20 °C to +40 °C does not require marking of the ambient temperature range.		N/A
	Electrical equipment designed for use in other than this normal ambient temperature range is considered to be special.		N/A
	The marking shall then include either the symbol *T*a or *T*amb together with both the upper and lower ambient temperatures or, if this is impracticable, the symbol “X“ shall be used to indicate specific conditions of use that include the upper and lower ambient temperatures. See item e) of 29.2 and Table 1.		P

EN 60079-0			
Clause	Requirement - Test	Result - Remark	Verdict
5.1.2	External source of heating or cooling		--
	Where the electrical equipment is intended to be physically connected to a separate external source of heating or cooling, such as a heated or cooled process vessel or pipeline, the ratings of the external source shall be specified in the manufacturer's instructions.		N/A
5.2	Service temperature		--
	Where this standard, or the standard for the specific type of protection, requires the service temperature to be determined at any place in the equipment, the temperature shall be determined for the rating of the electrical equipment when the equipment is subjected to maximum or minimum ambient temperature and, where relevant, the maximum rated external source of heating or cooling.		N/A
	Service temperature testing, when required, shall be in accordance with 26.5.1.		P
5.3	Maximum surface temperature		P
5.3.1	Determination of maximum surface temperature		P
	Maximum surface temperature shall be determined according to 26.5.1 or the specific requirement of the standard for the type of protection, and when the equipment is subjected to maximum ambient temperature and, where relevant, the maximum rated external source of heating.		P
5.3.2	Limitation of maximum surface temperature		P
5.3.2.1	Group I electrical equipment		---
	For electrical equipment of Group I, the maximum surface temperature shall be specified in relevant documentation according to Clause 24.		N/A
	This maximum surface temperature shall not exceed		---
	150 °C on any surface where coal dust can form a layer,		N/A
	450 °C where coal dust is not likely to form a layer		N/A
5.3.2.2	Group II electrical equipment		P
	The maximum surface temperature determined shall not exceed:		---
	the temperature class assigned (see Table 2),		P
	the maximum surface temperature assigned,		P
	the ignition temperature of the specific gas for which it is intended.		P
5.3.2.3	Group III electrical equipment		N/A
5.3.2.3.1	Maximum surface temperature determined without a dust layer		N/A
	The maximum surface temperature determined (see 26.5.1) shall not exceed:		N/A
	the maximum surface temperature assigned;		N/A
	the layer or cloud ignition temperature of the specific combustible dust for which it is intended.		N/A

EN 60079-0			
Clause	Requirement - Test	Result - Remark	Verdict
5.3.2.3.2	Maximum surface temperature with respect to dust layers		N/A
5.3.3	Small component temperature for Group I or Group II electrical equipment		N/A
	The maximum surface temperature shall not exceed the temperature class unless subjected to the following.		N/A
	Small components, for example transistors or resistors, whose temperature exceeds that permitted for the temperature classification, shall be acceptable providing that they conform to one of the following:		---
	a) when tested in accordance with 26.5.3, small components shall not cause ignition of the flammable mixture and any deformation or deterioration caused by the higher temperature shall not impair the type of protection;		N/A
	b) for T4/T5/T6 and Group I classification, small components shall conform to Table 3a and Table 3b;		N/A
	c) for T5 classification, the surface temperature of a component with a surface area smaller than 1 000 mm2 (excluding lead wires) shall not exceed 150 °C.		N/A
	For potentiometers, the surface to be considered shall be that of the resistance element and not the external surface of the component.		N/A
	The mounting arrangement and the heat-sinking and cooling effect of the overall potentiometer construction shall be taken into consideration during the test. Temperature shall be measured on the track with that current which flows under the test conditions required by the standard for the specific type of protection. If thisresults in a resistance value of less than 10 % of the track resistance value, the measurements shall be carried out at 10 % of the track resistance value.		N/A
	For surface areas of not more than 1 000 mm2, the surface temperature may exceed that for the temperature class marked on the Group II electrical equipment or the corresponding maximum surface temperature for Group I electrical equipment, if there is no risk of ignition from these surfaces, with a safety margin of 50 K for T1, T2 and T3, 25 K for T4/T5/T6, T5 and T4/T5/T6 and Group I. This safety margin shall be ensured by experience of similar components or by tests of the electrical equipment itself in representative explosive mixtures.		N/A
6	Requirements for all electrical equipment		P
6.1	General		P
	Electrical equipment and Ex Components shall	The samples comply with the requirements of EN 60079-0, EN 60079-11	---
	a) comply with the requirements of this standard, together with one or more of the specific standards listed in Clause 1,		P
	b) be constructed in accordance with the applicable safety requirements of the relevant industrial standards.		P
6.2	Mechanical strength of equipment		P
	The equipment shall be subjected to the tests of 26.4.		P

EN 60079-0			
Clause	Requirement - Test	Result - Remark	Verdict
	Guards relied upon to provide protection from impact shall be removable only by the use of a tool and shall remain in place for the required impact tests.	Pass muster	P
6.3	Opening times		P
	Enclosures which can be opened more quickly than		P
	a) any incorporated capacitors, charged by a voltage of 200 V or more, to discharge to a value of residual energy		---
	0,2 mJ for electrical equipment of Group I or Group IIA,		N/A
	0,06 mJ for electrical equipment of Group IIB,		P
	0,02 mJ for electrical equipment of Group IIC, including equipment marked Group II only		N/A
	0,2 mJ for electrical equipment for Group III,		N/A
	double the above energy levels if the charging voltage is less than 200 V,		N/A
	b) the surface temperature of enclosed hot components reduces to below the assigned maximum surface temperature of the electrical equipment		N/A
	shall be marked with one of the following warning markings:		---
	an enclosure opening delay marking as specified in item		N/A
	an enclosure opening marking as specified in item		N/A
6.4	Circulating currents		N/A
	Where necessary, precautions shall be taken to guard against any effect due to the presence of circulating currents caused by stray magnetic fields, and the arcs or sparks that may occur as a result of interrupting such currents, or excessive temperatures caused by such currents.		N/A
	Bonding conductors shall be such that they will only conduct through the designed connection points and not through any insulated joints.		N/A
	In order to ensure reliable current transfer without the risk of sparking under adverse operating conditions, such as vibration or corrosion, the bonds shall be protected against corrosion and loosening in accordance with 15.4.		N/A
	Particular care shall be taken with bare flexible conductors in close proximity to the bonded parts.		N/A
	Bonding conductors are not required where insulation ensures that circulating currents cannot low between parts.		N/A
	The insulation of such parts shall be capable of withstanding a test of 00 V r.m.s for 1 min.		N/A
	However, provision shall be made for adequate earthing of isolated xposed conductive parts.		N/A
6.5	Gasket retention		P
	Where the degree of protection provided by the enclosure depends on a gasketed joint which s intended to be opened for installation or maintenance purposes, gaskets shall be attached or secured to one of the mating faces to prevent loss, damage or incorrect assembly.	Pass muster	P
	The asket material shall not itself adhere to the other joint face.		P
6.6	Electromagnetic and ultrasonic energy radiating equipment		N/A
	The energy levels shall not exceed the values given below.		N/A

EN 60079-0			
Clause	Requirement - Test	Result - Remark	Verdict
6.6.1	Radio frequency sources		N/A
	The threshold power of radio frequency (9 kHz to 60 GHz) for continuous transmissions and or pulsed transmissions whose pulse durations exceed the thermal initiation time shall not exceed the values shown in Table 4.		N/A
	Programmable or software control intended for setting by the user shall not be permitted		N/A
6.6.2	Lasers or other continuous wave sources		N/A
6.6.3	Ultrasonic sources		N/A
7	Non-metallic enclosures and non-metallic parts of enclosures	metallic enclosures	N/A
7.1	General		N/A
7.1.1	Applicability		N/A
	The requirements given in this clause and in 26.7 shall apply to non-metallic enclosures and on-metallic parts of enclosures, on which the type of protection depends.		N/A
	The requirements of 7.4 also apply to non-metallic parts which are applied to the external urface of an enclosure.		N/A
7.1.2	Specification of materials		N/A
	The documents according to Clause 24 shall specify the material of the enclosure or part of the enclosure.		N/A
7.1.3	Plastic materials		N/A
	The specification for plastic materials shall include the following:		---
	a) the name of the manufacturer		N/A
	b) the exact and complete reference of the material, including its colour, percentage of fillers and any other additives,		N/A
	c) the possible surface treatments, such as varnishes,		N/A
	d) the temperature index TI, corresponding to the 20 000 h point on the thermal endurance graph without loss of flexural strength exceeding 50 %, determined in accordance with IEC 60216-1 and IEC 60216-2 and based on the flexing property in accordance with ISO 178. If the material does not break in this test before exposure to the heat, the index shall be based on the tensile strength in accordance with ISO 527-2 with test bars of Type 1A or 1B. As an alternative to the TI, the relative thermal index (RTI – mechanical impact) may be determined in accordance with ANSI/UL 746B.		N/A
7.1.4	Elastomeric materials		N/A
	The specification for elastomeric materials shall include the following:		N/A
	a) the name of the manufacturer;		N/A
	b) the exact and complete reference of the material, including its colour, percentage of fillers and any other additives,		N/A
	c) the possible surface treatments, such as varnishes,		N/A
	d) the continuous operating temperature (COT). As an alternative to the COT, the relative thermal index (RTI – mechanical impact) may be determined in accordance with ANSI/UL 746B		N/A
	The data by which these characteristics are defined shall be supplied.		N/A
7.2	Thermal endurance		N/A
7.2.1	Tests for thermal endurance		N/A

EN 60079-0			
Clause	Requirement - Test	Result - Remark	Verdict
	The tests for endurance to heat and to cold shall be conducted in accordance with 26.8 and 26.9.		N/A
7.2.2	Material selection		N/A
	The plastic materials shall have a temperature index “TI” corresponding to the 20 000 h point or RTI – mechanical of at least 20 K greater than the temperature of the hottest point of the enclosure or the part of the enclosure (see 26.5.1), having regard to the maximum ambient temperature in service.		N/A
	The elastomeric materials shall have a continuous operating temperature (COT) below, or equal to, the minimum service temperature and at least 20 K above the maximum service temperature.		N/A
7.3	Resistance to light		N/A
	The resistance to light of the enclosures, or parts of enclosures, of non-metallic materials shall be satisfactory		N/A
	Where not otherwise protected from exposure to light, a test of resistance of the material to ultraviolet light shall be made if the enclosure or parts of the enclosure, upon which the type of protection depends, are made of non-metallic materials.		N/A
	For Group I equipment, the test applies only to luminaires.		N/A
	If the equipment is protected from light (for example, daylight or light from luminaires) when installed, and, in consequence, the test is not carried out, the equipment shall be marked by the symbol “X” to indicate this specific condition of use according to item e) of 29.2.		N/A
7.4	Electrostatic charges on external non-metallic materials		N/A
7.5	Threaded holes		N/A
	Threaded holes for fasteners which secure covers intended to be opened in service for adjustment, inspection and other operational reasons, shall only be tapped into the nonmetallic material when the thread form is compatible with the non-metallic material of the enclosure		N/A
8	Metallic enclosures and metallic parts of enclosures		P
8.1	Material composition		P
	The documents according to Clause 24 shall specify the material of the enclosure or part of the enclosure.		P
8.1.1	Group I		N/A
	Materials used in the construction of enclosures of Group I electrical equipment of EPL Ma or Mb shall not contain, by mass, more than		---
	a) 15 % in total of aluminium, magnesium, titanium and zirconium,		N/A
	b) 7,5 % in total of magnesium, titanium and zirconium.		N/A
	The above requirement need not apply to Group I portable measuring equipment,		N/A
	This equipment shall then be marked “X” in accordance with item e) of 29.2 and the specific condition of use shall indicate the special precautions to be applied during storage,transportation and use.		N/A
8.1.2	Group II	Shell: Stainless steel	P
8.1.3	Group III		N/A
	Materials used in the construction of enclosures of Group III		N/A

EN 60079-0			
Clause	Requirement - Test	Result - Remark	Verdict
	electrical equipment for the identified equipment protection levels shall not contain, by mass, more than:		
	for EPL Da 7,5 % in total of magnesium and titanium;		N/A
	for EPL Db 7,5 % in total of magnesium and titanium;		N/A
	for EPL Dc no requirements except for fans, fanhoods and ventilating screens, which shall comply with the requirements for EPL Db.		N/A
8.2	Threaded holes		P
	Threaded holes for fasteners which secure covers intended to be opened in service for adjustment, inspection and other operational reasons shall only be tapped into the material when the thread form is compatible with the material of the enclosure.		P
9	Fasteners		P
9.1	General		P
	Parts necessary to achieve a specific type of protection or used to prevent access to uninsulated live parts shall be capable of being released or removed only with the aid of a tool	Pass muster	P
	Fastening screws for enclosures of materials containing light metals may be made of light metal or non-metallic material if the material of the fastener is compatible with that of the enclosure.		P
9.2	Special fasteners		P
9.3	Holes for special fasteners		P
9.3.1	Thread engagement		P
	Holes for special fasteners, as specified in 9.2, shall bethreaded for a distance to accept a thread engagement, *h*, at least equal to the major diameter of the thread of the fastener (see Figures 1 and 2).		P
9.3.2	Tolerance and clearance		P
9.3.3	Hexagon socket set screws		P
	In the case of hexagon socket set screws, the screw shall have a tolerance class of 6h in accordance with ISO 965-1 and ISO 965-3 and shall not protrude from the threaded hole after tightening.		P
10	Interlocking devices	No interlocking device	N/A
	Where an interlocking device is used to maintain a specific type of protection, it shall be so constructed that its effectiveness cannot easily be defeated.		N/A
11	Bushings		N/A
	Bushings used as connection facilities and which may be subjected to a torque during connection or disconnection, shall be mounted in such a way that all parts are secured against turning.		N/A
12	Materials used for cementing		N/A
	The documents, according to Clause 24, shall testify that for the intended operating conditions, the materials used for cementing on which the type of protection depends, have a thermal stability adequate for the minimum and maximum temperatures to which they shall be subjected, within the rating of the electrical		N/A

EN 60079-0			
Clause	Requirement - Test	Result - Remark	Verdict
	equipment.		
	The thermal stability shall be considered adequate if the limiting values for the continuous operating temperature (COT) of the material are below, or equal to, the lowest service temperature and at least 20 K above the maximum service temperature.		N/A
13	Ex components	No Ex components	N/A
13.1	General		N/A
	Ex components shall comply with the requirements given in Annex B. Examples of Ex components include:		---
	a) an empty enclosure;		N/A
	b) components or assemblies of components for use with equipment which complies with the requirements of one or more of the types of protection listed in Clause 1.		N/A
13.2	Mounting		P
	a) completely within an equipment enclosure	Pass muster	P
	b) completely external to the equipment enclosure	Pass muster	P
	c) partly within and partly external to the equipment enclosure	Pass muster	P
13.3	Internal mounting	Pass muster	P
	Where the Ex component is mounted completely within the enclosure, the only parts that shall be tested or assessed are those parts which have not been tested and/or assessed as a separate component (for example, test or assessment of surface temperature, creepage distance and clearance from the component to surrounding conducting parts).		P
13.4	External mounting		P
	the Ex component is mounted external to the enclosure or partly within and partly external to the enclosure, the interface between the Ex component and the enclosure shall be tested or assessed for compliance with the relevant type of protection and the enclosure tests as specified in 26.4.		P
14	Connection facilities and termination compartments		N/A
14.1	General		N/A
	Electrical equipment intended for connection to external circuits shall include connection facilities, with the exception of electrical equipment that is manufactured with a cable permanently connected to it.		N/A
14.2	Termination compartment		N/A
	Termination compartments and their access openings shall be dimensioned so that the conductors can be readily connected.		N/A
14.3	Type of protection		N/A
	Termination compartments shall comply with one of the specific types of protection listed in Clause 1.		N/A
14.4	Creepage and clearance		N/A
	Termination compartments shall be so designed that after proper connection of the conductors, the creepage distances and the clearances comply with the requirements, if any, of the specific type of protection concerned.		N/A
15	Connection facilities for earthing or bonding conductors		P

EN 60079-0			
Clause	Requirement - Test	Result - Remark	Verdict
15.1	Equipment requiring earthing	a) Set on PCB board b) A grounding point is set on the four pin plug-in terminal	P
15.1.1	Internal		P
	A connection facility for the connection of an earthing conductor shall be provided inside the lectrical equipment adjacent to the other connection facilities.		P
15.1.2	External		P
	An additional external connection facility for an equipotential bonding conductor shall be rovided for electrical equipment with a metallic enclosure,		P
	except for electrical equipment hich is designed to be:		---
	a) moved when energized and is supplied by a cable incorporating an earthing or quipotential bonding conductor;		N/A
	b) installed only with wiring systems not requiring an external earth connection, for example,metallic conduit or armoured cable.		N/A
	The manufacturer shall provide details on any earthing or equipotential bonding required for he installation under conditions a) or b) above in the instructions provided in accordance with Clause 30.	Pass muster	P
15.2	Equipment not requiring earthing		N/A
	there is no requirement for earthing or bonding		N/A
15.3	Size of conductor connection		P
	Protective earthing connection facilities shall allow for the effective connection of at least one onductor with a cross-sectional area		P
15.4	Protection against corrosion		P
	Connection facilities shall be effectively protected against corrosion. Special precautions shall e taken if one of the parts in contact consists of a material containing light metal, for xample, by using an intermediate part made of steel when making a connection to a material ontaining light metals.		P
15.5	Secureness of electrical connections		P
	Connection facilities shall be designed so that the electrical conductors cannot be readily loosened or twisted.	No loosened or twisted	P
	Contact pressure on the electrical connections shall be maintained and not be affected by dimensional changes of insulating materials in service, due to factors such as temperature or humidity.		P
	For non-metallic walled enclosures provided with an internal earth continuity plate, the test of 26.12 shall be applied.		P
16	Entries into enclosures	No such equipment	N/A
16.1	General		N/A
	Entry into the equipment shall be either by a plain or threaded hole located in		---
	the wall of the enclosure,		N/A
	an adaptor plate designed to be fitted in or on the walls of the enclosure.		N/A
16.2	Identification of entries		N/A
	The manufacturer shall specify, in the documents submitted according to Clause 24, the entries, their position on the		N/A

EN 60079-0			
Clause	Requirement - Test	Result - Remark	Verdict
	equipment and the number permitted. The thread form (for example, metric or NPT) of threaded entries shall be marked on the equipment or shall appear in the installation instructions		
16.3	Cable glands		N/A
	Cable glands, when installed in accordance with the instructions required by Clause 30, shall not invalidate the specific characteristics of the type of protection of the electrical equipment on which they are mounted. This shall apply to the whole range of cable dimensions specified by the manufacturer of the cable glands as suitable for use with those glands. Cable glands may form an integral part of the equipment, i.e. one major element or part forms an inseparable part of the enclosure of the equipment. In such cases, the glands shall be tested with the equipment.		N/A
16.4	Blanking elements		N/A
	Blanking elements, intended to close unused openings in the enclosure walls of electrical equipment, shall satisfy the requirements of the specific type of protection concerned. The blanking element shall only be removable with the aid of a tool.		N/A
16.5	Temperature at branching point and entry point		N/A
	When the temperature under rated conditions is higher than 70 °C at the entry point or 80 °C at the branching point of the conductors, information shall be marked on the equipment exterior to provide guidance to the user on the proper selection of cable and cable gland or conductors in conduit.		N/A
16.6	Electrostatic charges of cable sheaths		N/A
	For the purposes of this standard, the sheaths of cables used for the connection of external circuits are not considered non-metallic enclosures or parts of enclosures as described by Clause 7 and need not be assessed against those requirements.		N/A
17	Supplementary requirements for rotating electrical machines	No such equipment	N/A
17.1	Fans and fan hoods		N/A
	External shaft-driven cooling fans of rotating electrical machines shall be enclosed by a fan hood which is not considered to be part of the enclosure of the electrical equipment. Such fans and fan hoods shall meet the requirements of 17.2 to 17.5.		N/A
17.2	Ventilation openings for external fans		N/A
	IP20 on the air inlet side,		N/A
	IP10 on the air outlet side,		N/A
	For vertical rotating electrical machines, foreign objects shall be prevented from falling into the ventilation openings. For Group I rotating electrical machines, the degree of protection IP10 is adequate only when the openings are designed or arranged so that foreign objects with dimensions above 12,5 mm cannot be carried onto the moving parts of the machine either by falling vertically or by vibration.		N/A
17.3	Construction and mounting of the ventilating systems		N/A
17.4	Clearances for the ventilating system		N/A
	Taking into account design tolerances, the clearances in normal operation between the external fan and its hood, the ventilation screens and their fasteners, shall be at least onehundredth of the maximum diameter of the fan, except that the clearances need not exceed 5 mm and may be reduced to 1 mm where the		N/A

EN 60079-0			
Clause	Requirement - Test	Result - Remark	Verdict
	opposing parts are manufactured so as to have controlled dimensional concentricity and dimensional stability. In no case shall the clearance be less than 1 mm.		
17.5	Materials for external fans and fan hoods		N/A
	Except for fans fitted to Group II rotating electrical machines and having a peripheral speed of below 50 m/s, external fans, fan hoods and ventilation screens shall have a surface resistance not exceeding 109 , measured in accordance with 26.13.		N/A
	The thermal stability of non-metallic materials shall be considered adequate if the TI specified by the manufacturer of the non-metallic material exceeds the maximum temperature to which the material is subjected in service (within the rating) by at least 20 K.		N/A
	The external fans, fan hoods, ventilation screens, of rotating electrical machines, manufactured from materials containing light metals shall comply with Clause 8.		N/A
17.6	Equipotential bonding conductors		N/A
	Depending on the design and rating of the machine, the manufacturer shall specify the crosssectional area and construction of equipotential bonding conductors which shall be fitted across enclosure joints, symmetrically placed with respect to the axis of the shaft.		N/A
18	Supplementary requirements for switchgear	No such equipment	N/A
18.1	Flammable dielectric		N/A
	Switchgear shall not have contacts immersed in flammable dielectric.		N/A
18.2	Disconnectors		N/A
	Where switchgear includes a disconnector, it shall disconnect all poles. The switchgear shall be designed so that either		---
	the position of the disconnector contacts is visible		N/A
	their open position is reliably indicated		N/A
	the disconnector and the cover or door of the switchgear shall allow this cover or door to be opened only when the separation of the disconnector contacts is effective.	No interlock	N/A
	Disconnectors, which are not designed to be operated under the intended load, shall either		---
	be electrically or mechanically interlocked with a suitable load breaking device,		N/A
	for Group II equipment only, be marked at a place near the actuator of the disconnector, with the operation under load marking given in item c) of 29.11.		N/A
18.3	Group I – Provisions for locking		N/A
	For Group I switchgear, the operating mechanism of disconnectors shall be capable of being padlocked in the open position.		N/A
	Provision shall be made to enable short-circuit and earth-fault relays, if used, to latch out. If the switchgear has a local resetting device which is accessible from the outside of the enclosure, its access cover shall have a special fastener according to 9.2.		N/A
18.4	Doors and covers		P
	Doors and covers giving access to the interior of enclosures containing remotely operated circuits with switching contacts		---

EN 60079-0			
Clause	Requirement - Test	Result - Remark	Verdict
	which can be made or broken by non-manual influences shall either		
	a) be interlocked with a disconnector which prevents access to the interior, unless it has been operated to disconnect unprotected internal circuits;		P
	b) be marked with the enclosure opening marking of item d)		P
	In the case of a) above, where it is intended that some internal parts shall remain energized after operation of the disconnector, in order to minimize the risk of explosion, those energized parts shall be protected by either		---
	1) one of the appropriate types of protection listed in Clause 1;		P
	2) protection as follows:		---
	clearances and creepage distances between phases (poles) and to earth in accordance with the requirements of IEC 60079-7;		P
	an internal supplementary enclosure which contains the energized parts and provides a degree of protection of at least IP20, according to IEC 60529;		P
	marking on the internal supplementary enclosure as required by item h) of 29.11.		P
19	Supplementary requirements for fuses		P
	Enclosures containing fuses shall either		---
	be interlocked so that insertion or removal of replaceable elements can be carried out only with the supply disconnected and so that the fuses cannot be energized until the enclosure is correctly closed,		P
	the equipment shall be marked with the enclosure opening marking as required by item d) of 29.11.		P
20	Supplementary requirements for plugs, socket outlets and connectors		N/A
20.1	Interlocking		N/A
	Plugs and socket outlets shall be either		---
	a) interlocked mechanically, or electrically, or otherwise designed so that they cannot be separated when the contacts are energized and the contacts cannot be energized when the plug and socket outlet are separated,		N/A
	b) fixed together by means of special fasteners according to 9.2 and the equipment marked with the separation marking as required by item e) of 29.11.		N/A
	b) fixed together by means of special fasteners according to 9.2 and the equipment marked with the separation marking as required by item e) of 29.11.		N/A
	Where they cannot be de-energized before separation because they are connected to a battery, the marking shall state the separation warning required by item f) of 29.11.		N/A
20.1.1	Explosive gas atmospheres		N/A
	It is not necessary for plugs and socket outlets of EPL Gb, where the rated current of a single pin does not exceed 10 A and rated voltage between any two pins does not exceed either 254 V a.c. or 60 V d.c., to comply with the requirements of this subclause if all of the following conditions are met:		---
	the part which remains energized is a socket outlet;		N/A
	there is a delay time for the separation of the plug and socket outlet such that the rated current flow ceases so no arc will occur on separation;		N/A

EN 60079-0			
Clause	Requirement - Test	Result - Remark	Verdict
	the plug and socket outlet remain flameproof in accordance with IEC 60079-1 during the arc-quenching period;		N/A
	the contacts remaining energized after separation are protected according to one of the specific types of protection listed in Clause 1.		N/A
20.1.2	Explosive dust atmospheres		N/A
	It is not necessary for plugs and socket outlets of EPL Db or EPL Dc, where the rated current of a single pin does not exceed 10 A and rated voltage between any two pins does not exceed either 254 V a.c. or 60 V d.c., to comply with the requirements of this subclause if all the following conditions are met:		N/A
	the part which remains energized is a socket outlet;		N/A
	the plug and socket outlet break the rated current with delayed release to permit the arc to be extinguished before separation;		N/A
	the plug and socket outlet shall comply with type of protection “t” according to IEC 60079-31 during the arc-quenching period.		N/A
20.2	Energized plugs		N/A
	Plugs and components remaining energized when not engaged with a socket outlet are not permitted.		N/A
21	Supplementary requirements for luminaires		N/A
21.1	General		N/A
	The source of light of luminaires shall be protected by a light-transmitting cover that may be provided with an additional guard. Dependent on the size of the openings in a guard, the tests according to 26.4.2 Table 12 are to be applied as follows:		N/A
	Guard openings greater than 2 500 mm2; tests a) and c) of Table 12.		N/A
	Guard openings between 625 mm2 and 2 500 mm2; tests a), b) and d) of Table 12.		N/A
	Guard openings less than 625 mm2; tests a) and b) of Table 12.		N/A
	No guard; tests a) and c) of Table 12.		N/A
	The mounting of luminaires shall not depend on just one screw. A single eyebolt may be used only if this is an integral part of the luminaire, for example by being cast or welded to the enclosure or, if threaded, the eyebolt is locked by a separate means against loosening when twisted.		N/A
21.2	Covers for luminaires of EPL Gb or EPL Db		N/A
	Covers giving access to the lampholder and other internal parts of luminaires shall either be		N/A
	a) interlocked with a device which automatically disconnects all poles of the lampholder as soon as the cover opening procedure begins,		N/A
	b) marked with the opening marking as required by item d) of 29.11.		
	In the case of a) above, where it is intended that some parts other than the lampholder will remain energized after operation of the disconnecting device, in order to minimize the risk of explosion, those energized parts shall be protected by either		
	1) one of the appropriate types of protection listed in Clause 1,		
	2) the means of protection given below:		
	the disconnecting device shall be so arranged that it cannot be operated manually to inadvertently energize unprotected parts;		
	clearances and creepage distances between phases (poles) and		

EN 60079-0			
Clause	Requirement - Test	Result - Remark	Verdict
	to earth in accordance with the requirements of IEC 60079-7;		
	an internal supplementary enclosure, which can be the reflector for the light source,which contains the energized parts and provides a degree of protection of at least IP20, according to IEC 60529;		
	marking on the internal supplementary enclosure as required by item h) of 29.11.		
21.3	Covers for luminaires of EPL Gc or EPL Dc		N/A
	Covers giving access to the lampholder and other internal parts of luminaires shall either be		---
	a) interlocked with a device which automatically disconnects all poles of the lampholder as soon as the cover opening procedure begins,		N/A
	b) marked with the opening marking as required by item d) of 29.11.		N/A
	In the case of a) above, where it is intended that some parts other than the lampholder will remain energized after operation of the disconnecting device, in order to minimize the risk of explosion, those energized parts shall be protected by		---
	clearances and creepage distances between phases (poles) and to earth in accordance with the requirements of IEC 60664-1 with over-voltage category II and pollution degree 3;		N/A
	an internal supplementary enclosure, which can be the reflector for the light source, which contains the energized parts and provides a degree of protection of at least IP20, according to IEC 60529;		N/A
	marking on the internal supplementary enclosure as required by item h) of 29.11.		N/A
21.4	Special lamps		N/A
	Lamps containing free metallic sodium (for example, low-pressure sodium lamps in accordance with IEC 60192) are not permitted. High-pressure sodium lamps (for example, in accordance with IEC 60662) may be used.		N/A
22	Supplementary requirements for caplights and handlights		N/A
22.1	Group I caplights		N/A
22.2	Group II and Group III caplights and handlights		N/A
	Leakage of the electrolyte shall be prevented in all positions of the equipment.		N/A
	Where the source of light and the source of supply are housed in separate enclosures, which are not mechanically connected other than by an electric cable, the cable glands and the connected cable shall be tested according to A.3.1 or A.3.2, as appropriate. The test shall be carried out using the cable which is to be used for connecting both parts. The type, dimensions and other relevant information about the cable which is to be used shall be specified in the manufacturer's documentation.		N/A
23	Equipment incorporating cells and batteries		N/A
23.1	General		N/A
	The requirements in 23.2 to 23.12 shall apply for all cells and batteries incorporated into explosion-protected equipment.		N/A
23.3	Batteries		N/A
	Batteries incorporated into explosion-protected equipment shall be formed only from cells connected in series.		N/A

EN 60079-0			
Clause	Requirement - Test	Result - Remark	Verdict
23.3	Cell types		N/A
	Only cell types referred to in published IEC cell standards having known characteristics shall be used. Tables 10 and 11 below list cells for which suitable standards either exist or are to be produced.		N/A
23.4	Cells in a battery		N/A
	All cells in a battery shall be of the same electrochemical system, cell design and rated capacity and shall be made by the same manufacturer.		N/A
23.5	Ratings of batteries		N/A
	All batteries shall be arranged and operated so as to be within the allowable limits defined by the cell or battery manufacturer.		N/A
23.6	Interchangeability		N/A
	Primary and secondary cells or batteries shall not be used inside the same equipment enclosure if they are readily interchangeable.		N/A
23.7	Charging of primary batteries		N/A
	Primary batteries shall not be re-charged. Where another voltage source exists inside equipment containing primary batteries and there is a possibility of interconnection,precautions shall be taken to prevent charging current passing through them.		N/A
23.8	Leakage		N/A
	All cells shall be constructed, or arranged so as to prevent leakage of electrolyte, which would adversely affect the type of protection or components on which safety depends.		N/A
23.9	Connections		N/A
	Only the manufacturer’s recommended method(s) of making electrical connections to a battery shall be used.		N/A
23.10	Orientation		N/A
	Where a battery is mounted inside equipment and the battery orientation is important for safe operation, the correct orientation of the equipment shall be indicated on the outside of the equipment enclosure.		N/A
23.11	Replacement of cells or batteries		N/A
	Where it is necessary for the user to replace cells or batteries contained within an enclosure, the relevant parameters to allow correct replacement shall be legibly and durably marked on or inside the enclosure as detailed in 29.12, or detailed in the manufacturer’s instructions in accordance with 30.2. That is, either the manufacturer’s name and part number, or the electrochemical system, nominal voltage and rated capacity.		N/A
23.12	Replaceable battery pack		N/A
	Where it is intended for the user to replace the battery pack, the battery pack shall be legibly and durably marked on the outside of the battery pack as detailed in 29.12.		N/A
	Replaceable battery packs shall be either:		---
	located completely inside the equipment enclosure,		N/A
	connected to the equipment and shall comply with the requirements for the applicable type of protection when disconnected from the equipment,		N/A
	connected to the equipment and shall employ disconnecting means that comply with the requirements of Clause 20.		N/A

EN 60079-0			
Clause	Requirement - Test	Result - Remark	Verdict
24	Documentation		P
	The manufacturer shall prepare documents that give a full and correct specification of the explosion safety aspects of the electrical equipment.		P
25	Compliance of prototype or sample with documents		P
	The prototype or sample of the electrical equipment subjected to the type verifications and tests shall comply with the manufacturer's documents referred to in Clause 24.		P
26	Type tests		P
26.1	General		P
	The prototype or sample shall be tested in accordance with the requirements for type tests of this standard and of the specific standards for the types of protection concerned.		P
	However,certain tests judged to be unnecessary, may be omitted from the testing programme.		P
	A record shall be made of all tests carried out and of the justification for those omitted.		P
	It is not necessary to repeat the tests that have already been carried out on an Ex component.		N/A
26.2	Test configuration		P
	Each test shall be made in the configuration of the electrical equipment considered to be the most unfavourable.		P
26.3	Tests in explosive test mixtures		P
	IEC 60079 series states if such tests are required and specifies the explosive test mixtures to be used.		P
26.4	Tests of enclosures		P
26.4.1	Order of tests		P
26.4.1.1	Metallic enclosures, metallic parts of enclosures and glass parts of enclosures		P
	Tests for metallic enclosures, metallic parts of enclosures and glass parts of enclosures shall be performed in the following order:		---
	tests for resistance to impact		P
	drop test		P
	tests for degrees of protection		P
	any other tests required by this standard;		P
	any other test specific to the type of protection concerned.		N/A
26.4.1.2	Non-metallic enclosures or non-metallic parts of enclosures		N/A
	Tests for non-metallic enclosures or non-metallic parts of enclosures shall be performed in the following order.		N/A
26.4.1.2 .1	Group I electrical equipment		N/A
	The tests shall be made on samples as follows:		---
	Four samples shall be used. All four samples shall be submitted to the tests of thermal endurance to heat (see 26.8), then to thermal endurance to cold (see 26.9). Two samples shall then be submitted to the tests for resistance to impact (see 26.4.2), then to the drop test if applicable (see 26.4.3), with the tests being conducted at the ‘upper test temperature’ (see 26.7.2). The other two samples shall also be submitted to the tests for resistance to impact (see 26.4.2), then to the drop test if applicable (see 26.4.3), but with the tests being conducted at the		N/A

EN 60079-0			
Clause	Requirement - Test	Result - Remark	Verdict
	‘lower test temperature’ (see 26.7.2). Any joint that is intended to be opened during installation or in normal operation shall be opened and reclosed in accordance with the manufacturer’s instructions. Subsequently, all four samples shall be submitted to the tests for degree of protection by enclosures (see 26.4.5), and then subjected to the appropriate tests specific to the type of protection concerned.		
	Alternatively, only two samples may be used. In this case, both samples shall be submitted to the tests of thermal endurance to heat (see 26.8), then to thermal endurance to cold (see 26.9). Both samples shall then be submitted to the tests for resistance to impact (see 26.4.2), and to the drop test if applicable (see 26.4.3), with the tests being conducted at the ‘upper test temperature’ (see 26.7.2). Thereafter, both samples shall also be submitted to the tests for resistance to impact (see 26.4.2), then to the drop test if applicable (see 26.4.3), but with the tests now being conducted at the ‘lower test temperature’ (see 26.7.2). Any joint that is intended to be opened during installation or in normal operation shall be opened and re-closed in accordance with the manufacturer’s instructions. Subsequently, both samples shall be submitted to the tests for degree of protection by enclosures (see 26.4.5), and then subjected to the appropriate tests specific to the type of protection concerned.		N/A
	Two samples shall be submitted to the tests of resistance to oils and greases (see 26.11) then to the tests for resistance to impact (see 26.4.2), then to the drop test if applicable (see 26.4.3), then the tests for degrees of protection (IP) if applicable (see 26.4.5), and finally to the tests specific to the type of protection concerned.		N/A
	Two samples shall be submitted to the tests of resistance to hydraulic liquids for mining applications (see 26.11) then to tests for resistance to impact (see 26.4.2), then to the drop test if applicable (see 26.4.3), then the tests for degrees of protection (IP) if applicable (see 26.4.5), and finally to the tests specific to the type of protection concerned.		N/A
26.4.1.2 .2	Group II and Group III electrical equipment		P
26.4.2	Resistance to impact		P
26.4.3	Drop test		P
26.4.4	Acceptance criteria		P
26.4.5	Degree of protection (IP) by enclosures		P
26.5	Thermal tests		P
26.6	Torque test for bushings		P
26.7	Non-metallic enclosures or non-metallic parts of enclosures		N/A
26.8	Thermal endurance to heat		N/A
26.9	Thermal endurance to cold		P
26.10	Resistance to light		N/A
26.11	Resistance to chemical agents for Group I electrical equipment		N/A
26.12	Earth continuity		P
	The material from which the enclosure is manufactured may be tested as a complete enclosure, part of an enclosure, or as a sample of the material from which the enclosure is		P

EN 60079-0			
Clause	Requirement - Test	Result - Remark	Verdict
	made, provided that the relevant critical dimensions of the sample are the same as those of the enclosure.		
	The cable gland shall be represented by a 20 mm (nominal) diameter test bar manufactured from brass (CuZn39Pb3 or CuZn38Pb4) carrying an ISO metric thread with a tolerance class 6g,1,5 mm pitch in accordance with IEC 60423. The length of the test bar shall ensure that at least one full thread remains free at each end when assembled, as shown in the diagram.		P
	Complete earth plates or parts of earth plates that are intended to be used with the enclosure shall be used for the purpose of this test.		P
	The clearance hole provided in the samples used for the test shall be between 22 mm and 23 mm diameter and the method of assembly shall ensure that the screw thread of the test bar does not make contact directly with the inside of the clearance hole.		P
	The clamping nuts shall be manufactured from brass (CuZn39Pb3 or CuZn38Pb4) and shall be provided with an ISO metric thread with a tolerance class 6H, 1,5 mm pitch in accordance with IEC 60423. The thickness of the nuts shall be 3 mm (nominal). The components are assembled as shown in Figure 4. The torque applied to each pair of the nuts, in turn, shall be 10 Nm (± 10 %). The hole in the wall (or part of the wall or the test sample) may be a plain through-hole or a tapped hole having a thread form compatible with the test bar. After the test sample has been assembled it shall be subjected to the conditions for the test for thermal endurance to heat as described in 26.8. This shall be followed by a further period of 14 days in an air oven at a temperature of 80 °C. On completion of conditioning, the resistance between the earth plates or parts of earth plates shall be calculated by passing a direct current of 10 A to 20 A between the earth plates and measuring the voltage drop between them.		P
	The non-metallic material that has been tested in this manner is deemed to be satisfactory if the resistance between the earth plates or parts of earth plates does not exceed 5 ×10–3 Ω.		N/A
26.13	Surface resistance test of parts of enclosures of non-metallic materials		N/A
26.14	Charging tests		N/A
26.15	Measurement of capacitance		P
	for Group I equipment: 50 pF		N/A
	for Group IIA equipment: 50 pF		N/A
	for Group IIB equipment: 15 pF		P
	for Group IIC equipment: 5 pF		N/A
	for Group III equipment: 10 pF		N/A
27	Routine tests	Pass muster	P
	The manufacturer shall also carry out any routine tests required by any of the standards listed in Clause 1 which were used for the examination and testing of the equipment.		P
28	Manufacturer's responsibility		P
28.1	Conformity with the documentation		P

EN 60079-0			
Clause	Requirement - Test	Result - Remark	Verdict
	The manufacturer shall carry out the verifications or tests necessary to ensure that the electrical equipment produced complies with the documentation.		P
28.2	Certificate		P
	The manufacturer shall prepare, or have prepared, a certificate confirming that the equipment is in conformity with the requirements of this standard along with its other applicable parts and additional standards mentioned in Clause 1. The certificate can relate to Ex equipment or an Ex component.		P
28.3	Responsibility for marking		P
	By marking the electrical equipment in accordance with Clause 29, the manufacturer attests on his own responsibility that		---
	the electrical equipment has been constructed in accordance with the applicable requirements of the relevant standards in safety matters,		P
	the routine verifications and routine tests in 28.1 have been successfully completed an that the product complies with the documentation.		P
29	Marking		P
29.1	Location		P
	The electrical equipment shall be legibly marked on a main part on the exterior of the equipment and shall be visible prior to the installation of the equipment.	legibly marked	P
29.2	General		P
	a) the name of the manufacturer or his registered trade mark;	Shanghai Chip Dance Co., Ltd.	P
	b) the manufacturer's type identification;		P
	c) a serial number,	The nameplate has reserved a factory number column	P
	d) the name or mark of the certificate issuer and the certificate reference in the following form	The nameplate has reserved a column for the explosion-proof certificate number	P
	e) if it is necessary to indicate specific conditions of use, the symbol “X” shall be placed after the certificate reference.	There are special usage conditions "X"	P
	f) the specific Ex marking for explosive gas atmospheres,		P
	g) any additional marking prescribed in the specific standards for the types of protection concerned	Meets the requirements	P
29.3	Ex marking for explosive gas atmospheres		P
29.4	Ex marking for explosive dust atmospheres		P
29.5	Combined types of protection		N/A
29.6	Multiple types of protection		N/A
29.7	Ga using two independent Gb types of protection		N/A
29.8	Ex components	No such equipment	N/A
29.9	Small equipment and small Ex components	No such equipment	N/A
29.10	Extremely small equipment and extremely small Ex components	No such equipment	N/A
29.11	Warning markings		P
29.12	Alternate marking of equipment protection levels (EPLs)	No Alternate marking	N/A
29.1	Alternate marking of type of protection for explosive gas atmospheres		N/A

29.2	Alternate marking of type of protection for explosive dust atmospheres		N/A
29.13	Cells and batteries		N/A

EN 60079-0			
Clause	Requirement - Test	Result - Remark	Verdict
30	Instructions		P
30.1	General		P
	The documentation prepared as required by Clause 24 shall include instructions, providing the following particulars as a minimum:		---
	a recapitulation of the information with which the electrical equipment is marked, except for the serial number (see Clause 29), together with any appropriate additional information to facilitate maintenance (for example, address of the importer, repairer, etc.);		P
	instructions for safety,		---
	putting into service;		P
	use;		P
	assembling and dismantling;		P
	maintenance, overhaul and repair;		P
	installation;		P
	adjustment;		P
	where necessary, training instructions;		P
	details which allow a decision to be made as to whether the equipment can be used safely in the intended area under the expected operating conditions;		P
	electrical and pressure parameters, maximum surface temperatures and other limit values;		P
	where applicable, specific conditions of use according to 29.2 e);		P
	where applicable, any special conditions of use, including particulars of possible misuse which experience has shown might occur;		P
	where necessary, the essential characteristics of tools which may be fitted to the equipment;		P
	a list of the standards, including the issue date, with which the equipment is declared to comply. The certificate can be used to satisfy this requirement.		P
30.2	Cells and batteries	No Cells or batteries	N/A
	In accordance with 23.11, where it is necessary for the user to replace cells or batteries contained within an enclosure, the relevant parameters to allow correct replacement shall be included in the instructions, including either the manufacturer's name and part number, or the electrochemical system, nominal voltage and rated capacity.	No Cells or batteries	N/A

EN 60079-11			
Clause	Requirement - Test	Result - Remark	Verdict
4	Grouping and classification of intrinsically safe apparatus and associated apparatus		P
	Intrinsically safe and associated apparatus which has a type of protection listed in IEC 60079-0 for use in the appropriate explosive atmosphere, shall be grouped in accordance with equipment grouping requirements of IEC 60079-0 and shall have a maximum surface temperature or temperature class assigned in accordance with the temperature requirements of IEC 60079-0.		P
	Associated apparatus which has no such type of protection shall only be grouped in accordance with the equipment grouping requirements of IEC 60079-0.		P
5	Levels of protection and ignition compliance requirements of electrical apparatus		P
5.1	General		P
	Intrinsically safe apparatus and intrinsically safe parts of associated apparatus shall be placed in Levels of Protection "ia", "ib" or “ic”.		P
5.2	Level of protection "ia"		N/A
	With *U*m and *U*i applied, the intrinsically safe circuits in electrical apparatus of level of protection "ia" shall not be capable of causing ignition in each of the following circumstances:		N/A
	a) in normal operation and with the application of those non-countable faults which give the most onerous condition		N/A
	b) in normal operation and with the application of one countable fault plus those non-countable faults which give the most onerous condition		N/A
	c) in normal operation and with the application of two countable faults plus those noncountable faults which give the most onerous condition.		N/A
	The non-countable faults applied may differ in each of the above circumstances		N/A
	In testing or assessing the circuits for spark ignition, the following safety factors shall be applied in accordance with 10.1.4.2: – for both a) and b) 1,5 – for c) 1,0		N/A
	The safety factor applied to voltage or current for determination of surface temperature classification shall be 1,0 in all cases		N/A
5.3	Level of protection "ib"		P
5.4	Level of protection "ic"		P
5.5	Spark ignition compliance		P
5.6	Thermal ignition compliance		P
5.6.1	General		P
5.6.2	Temperature for small components for Group I and Group II		P
5.6.3	Wiring within intrinsically safe apparatus for Group I and Group II		P
5.6.3	Tracks on printed circuit boards for Group I and Group II		P
5.6.4	Intrinsically safe apparatus and component temperature for Group III		N/A
5.7	Simple apparatus		N/A
6	Apparatus construction		P

EN 60079-11			
Clause	Requirement - Test	Result - Remark	Verdict
6.1	Enclosures		P
6.1.1	General		P
6.1.2	Enclosures for Group I or Group II apparatus		P
6.1.2.1	General		P
6.1.2.2	Apparatus complying with Table 5		P
6.1.2.3	Apparatus complying with Annex F		P
6.1.3	Enclosures for Group III apparatus		N/A
6.2	Facilities for connection of external circuits		P
6.2.1	Terminals		P
6.2.2	Plugs and sockets		P
6.2.3	Determination of maximum external inductance to resistance ratio (*Lo/Ro*) for resistance limited power source		P
6.2.4	Permanently connected cable		P
6.2.5	Requirements for connections and accessories for IS apparatus when located in the non-hazardous area		P
6.3	Separation distances		N/A
6.3.1	General		N/A
6.3.2	Separation of conductive parts	Distance between circuit and ground: 2.04mm	N/A
6.3.2.1	Distances according to Table 5		N/A
6.3.2.2	Distances according to Annex F		N/A
6.3.3	Voltage between conductive parts		N/A
6.3.4	Clearance		N/A
6.3.5	Separation distances through casting compound		N/A
6.3.6	Separation distances through solid insulation		N/A
6.3.7	Composite separations		N/A
6.3.8	Creepage distance		N/A
6.3.9	Distance under coating		N/A
6.3.10	Requirements for assembled printed circuit boards		N/A
6.3.11	Separation by earthed screens		N/A
6.3.12	Internal wiring		N/A
6.3.13	Dielectric strength requirement		P
6.3.14	Relays		N/A
6.4	Protection against polarity reversal		P
6.5	Earth conductors, connections and terminals		N/A
6.6	Encapsulation		P
6.6.1	General		P
6.6.2	Encapsulation used for the exclusion of explosive atmospheres	All circuits of the sample are covered with encapsulated compounds, without considering the possibility of spark ignition inside the encapsulated components.	P
7	Components on which intrinsic safety depends		P

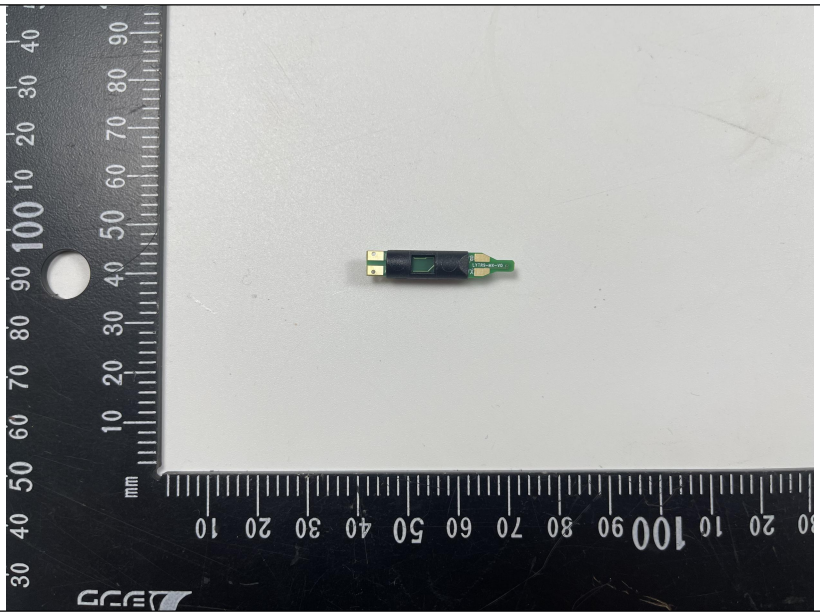
7.1	Rating of components		P
7.2	Connectors for internal connections, plug-in cards and components		P
7.3	Fuses		N/A

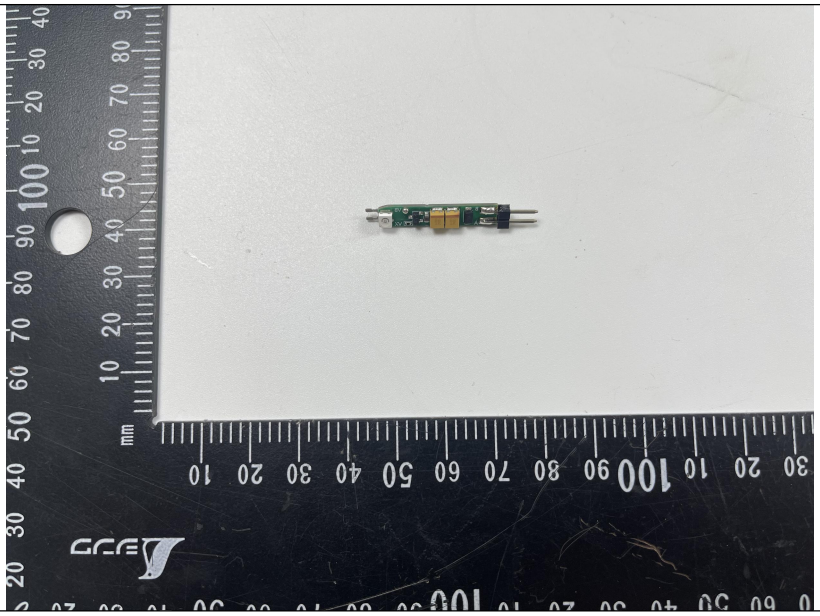
EN 60079-11			
Clause	Requirement - Test	Result - Remark	Verdict
7.4	Primary and secondary cells and batteries		P
7.4.1	General		P
7.4.2	Battery construction		P
7.4.3	Electrolyte leakage and ventilation		P
7.4.4	Cell voltages		P
7.4.5	Internal resistance of cell or battery		P
7.4.6	Batteries in equipment protected by other types of protection		P
7.4.7	Batteries used and replaced in explosive atmospheres		P
7.4.8	Batteries used but not replaced in explosive atmospheres		P
7.4.9	External contacts for charging batteries		P
7.5	Semiconductors		N/A
7.5.1	Transient effects		N/A
7.5.2	Shunt voltage limiters		N/A
7.5.3	Series current limiters		N/A
7.6	Failure of components, connections and separations		P
7.7	Piezo-electric devices		N/A
7.8	Electrochemical cells for the detection of gases		P
8	Infallible components, infallible assemblies of components and infallible connections on which intrinsic safety depends		P
8.1	Level of Protection “ic”		P
8.2	Mains transformers		N/A
8.2.1	General		N/A
8.2.2	Protective measures		N/A
8.2.3	Transformer construction		N/A
8.2.4	Transformer type tests		N/A
8.2.5	Routine test of mains transformers		N/A
8.3	Transformers other than mains transformers		N/A
8.4	Infallible windings		N/A
8.4.1	Damping windings		N/A
8.4.2	Inductors made by insulated conductors		N/A
8.5	Current-limiting resistors		P
8.6	Capacitors		P
8.7	Shunt safety assemblies		P
8.8	Wiring, printed circuit board tracks, and connections		P
8.9	Galvanically separating components		N/A
9	Supplementary requirements for specific apparatus		N/A
10	Type verifications and type tests		P
11	Routine verifications and tests		N/A
12	Marking		P
12.1	General		P
12.2	Marking of connection facilities		P

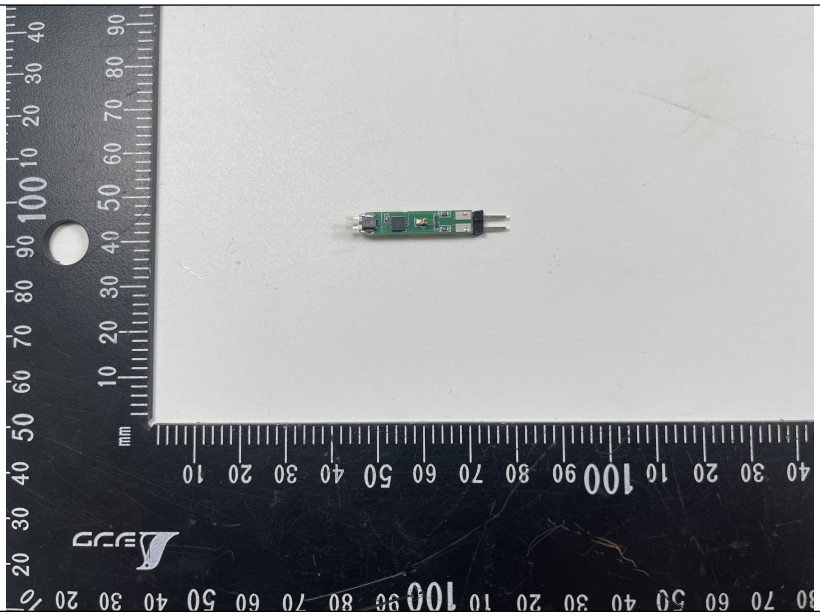
12.3	Warning markings		P
12.4	Examples of marking	Pass muster	P
12.5	Documentatio		P

Photo documentation:

Type of equipment: Model:	ELECTRONIC DETONATOR CONTROL MODULES, CBECM-CM-01/02/03, CBECM-TB-01/02/03, CBECM-TS-01/02/03, CBECM-EB-01/02/03, CBECM-ES-01/02/03

Details of:	
View: [X] general [ ] front [ ] rear [ ] right [ ] left [ ] top [ ] bottom	

Details of:	
View: [X] general [ ] front [ ] rear [ ] right [ ] left [ ] top [ ] bottom	

Details of:	
View: [X] general [ ] front [ ] rear [ ] right [ ] left [ ] top [ ] bottom	

- End of Review Report -