BS EN 60079-11:2012

Incorporating corrigendum January 2012

BSI Standards Publication

Explosive atmospheres

Part 11: Equipment protection by intrinsic safety "i"

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National foreword

This British Standard is the UK implementation of EN 60079-11:2012. It is identical to IEC 60079-11:2011, incorporating corrigendum January 2012. It supersedes BS EN 60079-11:2007 and BS EN 61241-11:2006 which are withdrawn. It also partially supersedes BS EN 60079-27:2008.

The start and finish of text introduced or altered by corrigendum is indicated in the text by tags. Text altered by IEC corrigendum January 2012 is indicated in the text by [AC1] 〈AC1〉.

The UK participation in its preparation was entrusted to Technical Committee EXL/31, Equipment for explosive atmospheres.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 August 2012.

Amendments/corrigenda issued since publication

Date	Text affected
31 August 2012	Implementation of IEC corrigendum January 2012

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60079-11

January 2012

ICS 29.260.20

Supersedes EN 60079-11:2007, EN 60079-27:2008 (partially), EN 61241-11:2006

English version

Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

(IEC 60079-11:2011)

Atmosphères explosives - Partie 11: Protection de l'équipement par sécurité intrinsèque "i" (CEI 60079-11:2011)

Explosionsgefährdete Bereiche - Teil 11: Geräteschutz durch Eigensicherheit "i" (IEC 60079-11:2011)

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 60079-11:2012 E

Foreword

The text of document 31G/207/FDIS, future edition 6 of IEC 60079-11, prepared by SC 31G, "Intrinsically-safe apparatus", of IEC/TC 31, "Equipment for explosive atmospheres" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60079-11:2012.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2012-07-06
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2014-08-04

This document supersedes EN 60079-11:2007, EN 61241-11:2006 and partially supersedes EN 60079-27:2008 (see Annex ZY for significant changes).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of this document.

Endorsement notice

The text of the International Standard IEC 60079-11:2011 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60079-15	NOTE	Harmonized as EN 60079-15.
IEC 61086-1:2004	NOTE	Harmonized as EN 61086-1:2004 (not modified).
IEC 62133	NOTE	Harmonized as EN 62133.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60079-0	-	Explosive atmospheres - Part 0: Equipment - General requirements	EN 60079-0	-
IEC 60079-7	-	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"	EN 60079-7	-
IEC 60079-25	-	Explosive atmospheres - Part 25: Intrinsically safe electrical systems	EN 60079-25	-
IEC 60085	-	Electrical insulation - Thermal evaluation and designation	EN 60085	-
IEC 60112	-	Method for the determination of the proof and the comparative tracking indices of solid insulating materials	EN 60112	-
IEC 60127	Series	Miniature fuses	EN 60127	Series
IEC 60317-3	-	Specifications for particular types of winding wires - Part 3: Polyester enamelled round copper wire, class 155	-	-
IEC 60317-7	-	Specifications for particular types of winding wires - Part 7: Polyimide enamelled round copper wire, class 220	HD 555.7 S2	-
IEC 60317-8	-	Specifications for particular types of winding wires - Part 8: Polyesterimide enamelled round copper wire, class 180	EN 60317-8	-
IEC 60317-13	-	Specifications for particular types of winding wires - Part 13: Polyester or polyesterimide overcoated with polyamide-imide enamelled round copper wire, class 200	EN 60317-13	-
IEC 60529	-	Degrees of protection provided by enclosures (IP Code)	-	-
IEC 60664-1	2007	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	EN 60664-1	2007
IEC 60664-3	2003	Insulation coordination for equipment within low-voltage systems - Part 3: Use of coating, potting or moulding for protection against pollution	EN 60664-3	2003

Publication	Year	Title	EN/HD	Year
IEC 61158-2	-	Industrial communication networks - Fieldbus specifications - Part 2: Physical layer specification and service definition	EN 61158-2	-
IEC 62013-1	-	Caplights for use in mines susceptible to firedamp - Part 1: General requirements - Construction and testing in relation to the risk of explosion	EN 62013-1	-
ANSI/UL 248-1	-	Standard for low-voltage fuses - Part 1: General requirements	-	-

Annex ZY
(informative)

Significant changes between this European Standard and EN 60079-11:2007

This European Standard supersedes EN 60079-11:2007.

The significant changes with respect to EN 60079-11:2007 are as listed below.

		Type		
Significant Changes	Clause	Minor and editorial changes	Extension	Major technical changes
Inclusion of non-edition specific references to EN 60079-11	Table 1	X		
The merging of the requirements for combustible dust atmospheres from EN 61241-11	e.g. 5.6.5. 6.1.3		X	
The merging of the apparatus requirements for FISCO from EN 60079-27	Annex G		X	
Clarification of the requirements for accessories connected to intrinsically safe apparatus such as chargers and data loggers.	6.2.5 7.4.9		X	
Addition of new test requirements for opto-isolators	10.11		X	
Introduction of Annex H about ignition testing of semiconductor limiting power supply circuits	Annex H		X	

NOTE: The technical changes referred include the significant technical changes from the EN revised but is not an exhaustive list of all modifications from the previous version.

Explanations:

A) Definitions

Minor and editorial changes clarification
decrease of technical requirements
minor technical change
editorial corrections

Changes in a standard classified as 'Minor and editorial changes' refer to changes regarding the previous standard, which modify requirements in an editorial or a minor technical way. Also changes of the wording to clarify technical requirements without any technical change are classified as 'Minor and editorial changes'.
A reduction in level of existing requirement is also classified as 'Minor and editorial changes'

Extension addition of technical options

Changes in a standard classified as 'extension' refers to changes regarding the previous standard, which add new or modify existing technical requirements, in a way that new options are given, but without increasing requirements for equipment that was fully compliant with the previous standard. Therefore these 'extensions' will not have to be considered for products in conformity with the preceding edition.

Major technical change	addition of technical requirements increase of technical requirements

Changes in a standard classified as 'Major technical change' refer to changes regarding the previous standard, which add new or increase the level of existing technical requirements, in a way that a product in conformity with the preceding standard will not always be able to fulfil the requirements given in the standard. 'Major technical changes' have to be considered for products in conformity with the preceding edition. For every change classified as 'Major Technical Change' additional information is provided in clause B) of the Annex ZY.

Note: These changes represent current technological knowledge[1]. However, these changes should not normally have an influence on equipment already placed on the market.

B) Information about the background of 'Major Technical Changes'
None.

Instructions:

The manufacturer or his authorised representative in the Community is to draw up the instructions for use in the required Community languages.

Marking:
The marking in this standard is to be supplemented/modified by the marking according to Directive 94/9/EC. Examples are given below.

European marking examples

Directive part	Standard part	Equipment example
II 1G	Ex ia IIC T4 –25 °C ≤ Ta ≤ +50 °C	Self-contained intrinsically safe apparatus
II 2G	Ex ib IIB T4 Ui = 24 V Ii = 80 mA Pi = 0.48 W	Intrinsically safe apparatus designed to be connected to other apparatus
I (M2)	[Ex ib] I Uo = 20 V Io = 300 mA Po = 1.5 W	Associated apparatus
II 2 (1) G	Ex ib [ia IIC Ga] IIB T6 Gb Ui = 30 V, Uo = 12 V, Io = 100 mA	Intrinsically safe apparatus Level of Protection 'ib' with 'ia' outputs
II 2 (1) G	Ex db [ia Ga] IIB T4 Gb Uo = 12 V, Io = 200 mA Po = 0.6 W	Associated apparatus protected by a flameproof enclosure

[1] see also ATEX Guidelines 10.3 and Annex ZZ.

Annex ZZ
(informative)

Coverage of Essential Requirements of EU Directives

This European Standard has been prepared under a mandate given to CENELEC by the European Union and the European Free Trade Association and within its scope the standard covers only the following essential requirements out of those given in Annex II of the EU Directive 94/9/EC:

- ER 1.0.1 indent 2, ER 1.0.2 (partly), ER 1.0.3 (partly), ER 1.0.4 (partly), ER 1.0.5 (partly), ER 1.0.6 (partly)
- ER 1.1 (partly)
- ER 1.2.1 (partly), ER 1.2.2 (partly), ER 1.2.4 (partly), ER 1.2.6 (partly), ER 1.2.8 (partly)
- ER 1.3.1 (partly)
- ER 1.4 (partly)
- ER 2.0.1.1 to ER 2.0.1.4
- ER 2.0.2.1 (partly), ER 2.0.2.2, ER 2.0.2.3
- ER 2.1.1.1 to ER 2.1.1.3
- ER 2.1.2.1 to ER 2.1.2.4
- ER 2.2.1.1 to ER 2.2.1.3
- ER 2.2.2.1 to ER 2.2.2.4
- ER 2.3.1.1, ER 2.3.1.2
- ER 2.3.2.1 to ER 2.3.2.3

Compliance with this standard provides one means of conformity with the specified essential requirements of the Directive[s] concerned.

WARNING: Other requirements and other EU Directives may be applicable to the products falling within the scope of this standard.

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

EXPLOSIVE ATMOSPHERES –

Part 11: Equipment protection by intrinsic safety "i"

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60079-11 has been prepared by subcommittee 31G: Intrinsically safe apparatus, of IEC technical committee 31: Equipment for explosive atmospheres.

This sixth edition cancels and replaces the fifth edition of IEC 60079-11 published in 2006, the first edition of IEC 61241-11 published in 2005, and the new Annex G replaces the apparatus requirements of the second edition of IEC 60079-27 published in 2008. This sixth edition constitutes a technical revision of these publications.

NOTE IEC 60079-25 cancels and replaces the remaining subject matter of IEC 60079-27.

The significant changes with respect to the previous edition are listed below:

- Inclusion of non-edition specific references to IEC 60079-0.
- The merging of the apparatus requirements for FISCO from IEC 60079-27.
- The merging of the requirements for combustible dust atmospheres from IEC 61241-11.

- Clarification of the requirements for accessories connected to intrinsically safe apparatus; such as chargers and data loggers.
- Addition of new test requirements for opto-isolators.
- Introduction of Annex H about ignition testing of semiconductor limiting power supply circuits.

The text of this standard is based on the following documents:

FDIS	Report on voting
31G/207/FDIS	31G/213/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This standard supplements and modifies the general requirements of IEC 60079-0, except as indicated in Table 1 (see Scope).

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 60079 series, under the general title: *Explosive atmospheres*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

EXPLOSIVE ATMOSPHERES –

Part 11: Equipment protection by intrinsic safety "i"

1 Scope

This part of IEC 60079 specifies the construction and testing of intrinsically safe apparatus intended for use in an explosive atmosphere and for associated apparatus, which is intended for connection to intrinsically safe circuits which enter such atmospheres.

This type of protection is applicable to electrical equipment in which the electrical circuits themselves are incapable of causing an explosion in the surrounding explosive atmospheres.

This standard is also applicable to electrical equipment or parts of electrical equipment located outside the explosive atmosphere or protected by another Type of Protection listed in IEC 60079-0, where the intrinsic safety of the electrical circuits in the explosive atmosphere may depend upon the design and construction of such electrical equipment or parts of such electrical equipment. The electrical circuits exposed to the explosive atmosphere are evaluated for use in such an atmosphere by applying this standard.

The requirements for intrinsically safe systems are provided in IEC 60079-25.

This standard supplements and modifies the general requirements of IEC 60079-0, except as indicated in Table 1. Where a requirement of this standard conflicts with a requirement of IEC 60079-0, the requirements of this standard shall take precedence.

If requirements in this standard are applicable to both intrinsically safe apparatus and associated apparatus the term “apparatus” is used throughout the standard.

This standard is for electrical equipment only; therefore the term “equipment” used in the standard always means “electrical equipment”.

If associated apparatus is placed in the explosive atmosphere, it shall be protected by an appropriate Type of Protection listed in IEC 60079-0, and then the requirements of that method of protection together with the relevant parts of IEC 60079-0 also apply to the associated apparatus.

Table 1 – Applicability of specific clauses of IEC 60079-0

Clause or subclause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-11		
			Intrinsically safe apparatus		Associated apparatus
Ed. 5.0 (2007) (informative)	Ed. 6.0 (2011) (informative)	Clause / Subclause title (normative)	Group I and Group II	Group III	
1	1	Scope	Applies	Applies	Applies
2	2	Normative references	Applies	Applies	Applies
3	3	Terms and definitions	Applies	Applies	Applies
4	4	Equipment grouping	Applies	Applies	Applies
4.1	4.1	Group I	Applies	Excluded	Applies
4.2	4.2	Group II	Applies	Excluded	Applies