

This is a preview of "BS EN IEC 60079-15:2...". [Click here to purchase the full version from the ANSI store.](#)



BSI Standards Publication

Explosive atmospheres

Part 15: Equipment protection by type of protection "n"

This is a preview of "BS EN IEC 60079-15:2...". [Click here to purchase the full version from the ANSI store.](#)

National foreword

This British Standard is the UK implementation of EN IEC 60079-15:2019. It is identical to IEC 60079-15:2017. Together with BS EN 60079-7:2015+A1:2018 and BS EN 60079-1:2014 it supersedes BS EN 60079-15:2010, which is withdrawn. The requirements related to Ex "nA" within BS EN 60079-15:2010 have been superseded by the requirements for Ex "ec" in BS EN 60079-7:2015. Requirements related to Ex "nC" (enclosed-break devices) in BS EN 60079-15:2010 have been superseded by requirements for Ex "dc" in BS EN 60079-1:2014.

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.

© The British Standards Institution 2019
Published by BSI Standards Limited 2019

ISBN 978 0 580 93042 3

ICS 29.260.20

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 30 April 2019.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

This is a preview of "BS EN IEC 60079-15:2019". Click here to purchase the full version from the ANSI store.

EUROPÄISCHE NORM

April 2019

ICS 29.260.20

Supersedes EN 60079-15:2010

English Version

Explosive atmospheres - Part 15: Equipment protection by type of protection "n" (IEC 60079-15:2017)

Atmosphères explosives - Partie 15: Protection du matériel
par mode de protection "n"
(IEC 60079-15:2017)

Explosionsfähige Atmosphäre - Teil 15: Geräteschutz durch
Zündschutzart "n"
(IEC 60079-15:2017)

This European Standard was approved by CENELEC on 2018-01-12. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

This is a preview of "BS EN IEC 60079-15:2...". [Click here to purchase the full version from the ANSI store.](#)

The text of document (31/1339/FDIS), future edition 5 of IEC 60079-15, prepared by IEC/TC 31 "Equipment for explosive atmospheres" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60079-15:2019.

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) 2019-10-19
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-04-19

This document supersedes EN 60079-15:2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC 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 60079-15:2017 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 60079-1	NOTE	Harmonized as EN 60079-1.
IEC 60079-2	NOTE	Harmonized as EN 60079-2.
IEC 60079-11	NOTE	Harmonized as EN 60079-11.
IEC 60079-17	NOTE	Harmonized as EN 60079-17.
IEC 60079-18	NOTE	Harmonized as EN 60079-18.
IEC 60297 (series)	NOTE	Harmonized in EN 60297 series.
IEC 61347-2-1	NOTE	Harmonized as EN 61347-2-1.

This is a preview of "BS EN IEC 60079-15:2...". Click here to purchase the full version from the ANSI store.

(normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60079-0	-	Explosive atmospheres - Part 0: Equipment - General requirements	EN IEC 60079-0	2018
IEC 60079-7	-	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"	EN 60079-7	2015

This is a preview of "BS EN IEC 60079-15:2...". Click here to purchase the full version from the ANSI store.

(informative)

Relationship between this European standard and the essential requirements of 2014/34/EU [2014 OJ L96] aimed to be covered

This European standard has been prepared under a Commission's standardisation request M/BC/CEN/92/46 to provide one voluntary means of conforming to essential requirements of 2014/34/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres (recast).

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZZ.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

Table ZZ.1 – Correspondence between this European standard and Annex II of Directive 2014/34/EU [2014 OJ L96]

<i>Essential Requirements of 2014/34/EU</i>	Clause(s) / sub-clause(s) of this EN	Remarks / Notes
1.0.1.	Entire Standard	Second indent only
1.0.2.	3.7 and note	In addition to EN 60079-0
1.0.3.		Reference to EN 60079-0
1.0.4.		Reference to EN 60079-0
1.0.5.		And reference to EN 60079-0
1.0.6.		Reference to EN 60079-0
1.1.		Reference to EN 60079-0
1.2.1.		Reference to EN 60079-0
1.2.2.		Reference to EN 60079-0
1.2.3.		Not applicable. Release of flammable material is not foreseen
1.2.4.		Not applicable. Dust atmospheres and deposits are out of scope
1.2.5.		Reference to EN 60079-0
1.2.6.		Warning label deemed adequate for Category 3 Equipment
1.2.7.		Reference to EN 60079-0 and relevant standards for normal industrial applications
1.2.8.		Not specifically applied to Category 3 Equipment but covered in general for normal conditions by the installation requirements in EN 60079-14
1.2.9.		Not applicable
1.3.1.		Reference to EN 60079-0, plus the principle of Ex n protection throughout standard
1.3.2.		Reference to EN 60079-0
1.3.3.		Reference to EN 60079-0
1.3.4.		Not applicable
1.3.5.		Not applicable
1.4.		Reference to EN 60079-0
1.5.		Not applicable

This is a preview of "BS EN IEC 60079-15:2...". [Click here to purchase the full version from the ANSI store.](#)

1.6.4.		Reference to EN 60079-0
1.6.5.		Not applicable
2.0. 2.1 and 2.2		Not applicable. Out of scope
2.3.1.	Entire standard	And reference to EN 60079-0
2.3.2.		Not applicable. Out of scope
3.		Not applicable. Out of scope

WARNING 1: Presumption of conformity stays valid only as long as a reference to this European standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2: Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

This is a preview of "BS EN IEC 60079-15:2...". [Click here to purchase the full version from the ANSI store.](#)

This is a preview of "BS EN IEC 60079-15:2...". [Click here to purchase the full version from the ANSI store.](#)

CONTENTS

FOREWORD	4
1 Scope	9
2 Normative references	15
3 Terms and definitions	16
4 General	17
4.1 Equipment grouping and temperature classification	17
4.2 Potential ignition sources	17
4.3 Equipment requirements	17
5 Maximum surface temperatures	17
6 Requirements for electrical equipment	18
6.1 General	18
6.2 Electric strength insulation from earth or frame	18
7 Requirements for non-incendive components	18
7.1 Type testing	18
7.2 Circuit limitations	18
8 Requirements for hermetically sealed devices	18
9 Requirements for sealed devices	19
9.1 Non-metallic materials	19
9.2 Opening	19
9.3 Internal spaces	19
9.4 Handling	19
9.5 Gasket and seals	19
9.6 Type tests	19
10 Requirements for restricted-breathing enclosures	19
10.1 General	19
10.2 Constructional requirements	20
10.2.1 Type of equipment	20
10.2.2 Cells and batteries	20
10.2.3 Cable glands and conduit entries	20
10.2.4 Operating rods, spindles and shafts	21
10.2.5 Windows	21
10.2.6 Gasket and seal requirements	21
10.2.7 Non-resilient seals	21
10.2.8 Test port	22
10.2.9 Internal fans	23
10.3 Temperature limitation	23
10.4 Additional requirements for restricted-breathing luminaires	23
10.4.1 Mounting arrangement	23
10.4.2 Reflectors	23
10.4.3 Surface temperatures of restricted-breathing luminaires	23
11 Type Tests	24
11.1 Tests for non incendive components	24
11.1.1 Preparation of non-incendive component samples	24
11.1.2 Test conditions for non-incendive components	24
11.2 Tests for sealed devices	25

This is a preview of "BS EN IEC 60079-15:2...". [Click here to purchase the full version from the ANSI store.](#)

11.2.1	Conditioning	25
11.2.2	Voltage test	25
11.2.3	Leakage tests on sealed devices	25
11.3	Type test requirements for restricted-breathing enclosures	26
11.3.1	General	26
11.3.2	Equipment where the volume of the enclosure will be unchanged due to pressure	26
11.3.3	Alternative type test for equipment where the volume of the enclosure changes due to pressure	26
12	Routine verifications and tests	27
12.1	Electric strength test	27
12.2	Routine test requirements for restricted-breathing enclosures	27
12.2.1	General	27
12.2.2	Test procedure	27
12.3	Routine temperature rise test	28
12.4	Temperature calculation	28
13	Marking	29
13.1	General	29
13.2	Examples of marking	29
13.3	Warning markings	29
14	Documentation	29
15	Instructions	30
	Bibliography	31
	Table 1 – Relationship of IEC 60079-15 to IEC 60079-0	9
	Table 2 – Text of warning markings	29

This is a preview of "BS EN IEC 60079-15:2...". Click here to purchase the full version from the ANSI store.

INTERNATIONAL ELECTROTECHNICAL COMMISSION

EXPLOSIVE ATMOSPHERES –

Part 15: Equipment protection by type of protection "n"

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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 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 60079-15 has been prepared by IEC technical committee 31: Equipment for explosive atmospheres.

This fifth edition cancels and replaces the fourth edition, published in 2010, and constitutes a technical revision.

This edition includes the following significant changes with respect to the previous edition:

The text of this International Standard is based on the following documents:

FDIS	Report on voting
31/1339/FDIS	31/1355/RVD

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

This is a preview of "BS EN IEC 60079-15:2...". [Click here to purchase the full version from the ANSI store.](#)

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

This International Standard is to be read in conjunction with IEC 60079-0.

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

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

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

This is a preview of "BS EN IEC 60079-15:2...". [Click here to purchase the full version from the ANSI store.](#)

Changes	Clause	Type		
		Minor and editorial changes	Extension	Major technical changes
Requirements for enclosed break devices have been removed	-			C1
Requirements for type of protection "nA" has been removed	-			C2
Scope has been updated to allow equipment with internal working voltages over 15 kV such as starters for HID luminaires	1		X	
Definition for cable sealing box removed	3	X		
Definitions for creepage distance and clearance removed as they are now in 60079-0	3	X		
Definition of non-sparking device "nA" removed, as the concept has been transferred to 60079-7	3			C2
Definition of duty cycle removed	3	X		
Definition of enclosed break device moved as the concept has been transferred to 60079-1	3			C1
Definition of hermetically sealed device revised	3	A1		
Definition for normally sparking device added	3.2	X		
Small component temperature clause removed, part of moving type of protection "nA" to 60079-7	5			C2
Minimum degree of protection requirements; clearance, creepage and separation requirements; determination of working voltage; conformal coating; CTI requirement; Insulation between conductive parts and measurement of creepage and clearance requirements have been removed.	6			C2
Connection facilities and terminal compartment requirements have been removed	-			C2
Supplementary requirements for non-sparking electrical rotating machines have been removed	-			C2
Supplementary requirements for non-sparking fuses and fuse assemblies have been removed	-			C2
Supplementary requirements for non-sparking plugs and sockets have been removed	-			C2
Supplementary requirements for non-sparking luminaires have been removed	-			C2
Supplementary requirements for equipment incorporating non-sparking cells and batteries have been removed	-			C2
Supplementary requirements for non-sparking low power equipment have been removed	-			C2
Supplementary requirements for non-sparking current transformers have been removed	-			C2
Requirements for other non-sparking electrical equipment have been removed	-			C2
General supplementary requirements for equipment producing arcs, sparks or hot surfaces have been removed	-			C2
Requirements for enclosed break devices have been removed	-			C1
Voltage and current limitations added for non-incendive components.	7.2			C6

This is a preview of "BS EN IEC 60079-15:2...". [Click here to purchase the full version from the ANSI store.](#)

Changes	Clause	Type		
		Minor and editorial changes	Extension	Major technical changes
The requirements for sealed devices have been extended to require more documentation,	9.1		X	
The +20K requirement for luminaire materials has been removed	9.5			C2
Notes 1-3 have been removed, as this information is covered elsewhere	10.1	X		
Entry device requirements added	10.1		X	
Industrial standard compliance and battery requirements added	10.2.1.2		X	
The exemption for manually operated sparking devices moved to here, creepage and clearance requirements in industrial standards added for switching devices, and cell and battery requirements added	10.2.1.2		X	
Requirements for cable glands and conduit entries have been clarified	10.2.3	X		
Requirements for gasketed windows expanded to allow a removable window mounted in a frame.	10.2.5.2		X	
Requirement to include documentation on the thermal stability of gaskets or seals added	10.2.6			C4
Requirements reworded for clarity	10.2.7	X		
Requirements for "nR" enclosures fitted with fans added.	10.2.9			C5
Type test requirements for enclosed break "nC" and "nA" equipment removed	-			C1, C2
The dielectric test after the leakage test for sealed devices has been eliminated unless the results of the leakage test are uncertain.	11.2.2		X	
Tests for sealed devices, screw lampholders, starters, lamps, ignitors, and ignitor pulses for luminaires have been removed	-			C2
All testing for batteries has been removed.	-			C2
All testing for electrical machines removed	-			C2
Routine test requirements re-written for sealed components, non-incendive components and restricted breathing equipment to take out the testing for enclosed break and nA equipment	12			C1, C2
Preparation of non-incendive component samples	11.1.1			C3
Marking requirements modified to remove labelling requirements for enclosed break components, nA equipment, and batteries.	-			C1, C2
Documentation requirements modified to remove to remove labelling requirements for enclosed break components, nA equipment, and batteries.	14			C1, C2
The instruction section has been expanded to include new requirements	15		X	
Annex A has been removed.	-			C2

NOTE The technical changes referred to include the significance of technical changes in the revised IEC Standard, but they do not form an exhaustive list of all modifications from the previous version.

This is a preview of "BS EN IEC 60079-15:2...". [Click here to purchase the full version from the ANSI store.](#)

Explanation of the types of changes:

A) Definitions

1) **Minor and editorial changes:**

- Clarification
- Decrease of technical requirements
- Minor technical change
- Editorial corrections

These are changes which modify requirements in an editorial or a minor technical way. They include changes of the wording to clarify technical requirements without any technical change, or a reduction in level of existing requirement.

2) **Extension:** Addition of technical options

These are changes 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 will not have to be considered for products in conformity with the preceding edition.

3) **Major technical changes:**

- addition of technical requirements
- increase of technical requirements

These are changes to technical requirements (addition, increase of the level or removal) made in a way that a product in conformity with the preceding edition will not always be able to fulfil the requirements given in the later edition. These changes have to be considered for products in conformity with the preceding edition. For these changes additional information is provided in Clause B below.

NOTE These changes represent current technological knowledge. However, these changes should not normally have an influence on equipment already placed on the market.

B) Information about the background of changes

- A1 – It was determined that this was already covered by the sealed device definition
- C1 – Enclosed break devices “nC” are now designated as “dc” and the requirements are located in IEC 60079-1:2014.
- C2 – Type of protection “nA” is now designated as type of protection “ec” and the requirements for “ec” equipment are located in IEC 60079-7:2015.
- C3 – Test time for the preparation of non-incendive component samples has been specified.
- C4 – Additional documentation requirements for seals and gaskets.
- C5 – As the pressure inside an enclosure fitted with fans can be affected by the operation of the fan, it is now specified that the restricted breathing test is conducted with fans operating and stationary.
- C6 – The limitations from IEC 60079-15 Ed 3 were added.

This is a preview of "BS EN IEC 60079-15:2...". Click here to purchase the full version from the ANSI store.

EXPLOSIVE ATMOSPHERES –

Part 15: Equipment protection by type of protection "n"

1 Scope

This part of IEC 60079 specifies requirements for the construction, testing and marking for Group II electrical equipment with type of protection "n" which includes; sealed devices "nC", hermetically sealed devices "nC", non-incendive components "nC" and restricted breathing enclosures "nR" intended for use in explosive gas atmospheres. This part of IEC 60079 applies to electrical equipment where the rated input voltage does not exceed 15 kV r.m.s. AC or DC including where the internal working voltages of the Ex product exceeds 15 kV, for example starters for HID luminaires.

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

Table 1 – Relationship of IEC 60079-15 to IEC 60079-0

Clause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-15	
Ed. 6.0 (2011) (informative)	Ed. 7.01 (future edition) (informative)	Clause / Subclause title (normative)	Protected sparking "nC"	Restricted breathing "nR"
3	3	Definitions	Applies	Applies
4	4	Equipment grouping		
4.1	4.1	Group I	Excluded	Excluded
4.2	4.2	Group II	Applies	Applies
4.3	4.3	Group III	Excluded	Excluded
4.4	4.4	Equipment for a particular explosive atmosphere	Applies	Applies
5	5	Temperatures		
5.1	5.1	Environmental influences	Applies	Applies
5.2	5.2	Service temperature	Applies	Applies
5.3	5.3	Maximum surface temperature		
5.3.1	5.3.1	Determination of maximum surface temperature	Applies	Applies
5.3.2	5.3.2	Limitation of maximum surface temperature		
5.3.2.1	5.3.2.1	Group I equipment	Excluded	Excluded
5.3.2.2	5.3.2.2	Group II equipment	Applies	Applies
5.3.2.3	5.3.2.3	Group III equipment	Excluded	Excluded

¹ Under preparation. Stage at the time of publication: IEC/FDIS 60079-0:2017.