

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 IEC 60079-11:2024. It is identical to IEC 60079-11:2023, incorporating corrigenda June 2024 and May 2026. It supersedes BS EN 60079-11:2012, which will be withdrawn on 31 December 2027.

The start and finish of text introduced or altered by corrigendum is indicated in the text by tags. Text altered by IEC corrigendum June 2024 is indicated in the text by AC1 AC1. Text altered by IEC corrigendum May 2026 is indicated in the text by AC2 AC2

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 committee manager.

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© The British Standards Institution 2026
Published by BSI Standards Limited 2026

ISBN 978 0 539 43053 0
ICS 13.230; 29.260.20

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 December 2024.

Amendments/corrigenda issued since publication

Date	Text affected
31 July 2026	Implementation of IEC corrigendum May 2026

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EUROPÄISCHE NORM

July 2026

ICS 29.260.20

English Version

Explosive atmospheres - Part 11: Equipment protection by
intrinsic safety "i"
(IEC 60079-11:2023/COR2:2026)

Atmosphères explosives - Partie 11: Protection de l'appareil
par sécurité intrinsèque "i"
(IEC 60079-11:2023/COR2:2026)

Explosionsgefährdete Bereiche - Teil 11: Geräteschutz
durch Eigensicherheit "i"
(IEC 60079-11:2023/COR2:2026)

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

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European foreword

The text of document 31G/352/FDIS, future edition 7 of IEC 60079-11 + COR1:2023, 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 IEC 60079-11:2024.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2025-12-31 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2027-12-31 document have to be withdrawn

This document supersedes EN 60079-11:2012 and all of its amendments and corrigenda (if any).

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The text of the International Standard IEC 60079-11:2023 + COR1:2023 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 standard indicated:

IEC 60068-2-14	NOTE	Approved as EN IEC 60068-2-14
IEC 60068-2-78	NOTE	Approved as EN 60068-2-78
IEC 60079-14	NOTE	Approved as EN IEC 60079-14
IEC 60079-18	NOTE	Approved as EN 60079-18
IEC 60079-19	NOTE	Approved as EN IEC 60079-19
IEC 60079-28	NOTE	Approved as EN 60079-28
IEC 60364-4-41	NOTE	Approved as HD 60364-4-41
IEC 61086-1	NOTE	Approved as EN 61086-1
IEC 61191-2	NOTE	Approved as EN 61191-2
IEC 62133-1	NOTE	Approved as EN 62133-1
IEC 62368-1	NOTE	Approved as EN IEC 62368-1

Endorsement notice

The text of the corrigendum IEC 60079-11:2023/COR2:2026 was approved by CENELEC as EN IEC 60079-11:2024/AC:2026-07 without any modification.

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(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	-
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 IEC 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 IEC 60112	-
IEC 60127	series	Miniature fuses	EN IEC 60127	series
IEC 60317-0-1	-	Specifications for particular types of winding wires - Part 0-1: General requirements - Enamelled round copper wire	EN 60317-0-1	-
IEC 60529	-	Degrees of protection provided by enclosures (IP Code)	EN 60529	-
IEC 60664-1	-	Insulation coordination for equipment within low-voltage supply systems - Part 1: Principles, requirements and tests	EN IEC 60664-1	-
IEC 60664-3	-	Insulation coordination for equipment within low-voltage systems - Part 3: Use of coating, potting or moulding for protection against pollution	EN 60664-3	-
IEC 60691	-	Thermal-links - Requirements and application guide	EN IEC 60691	-
IEC 60747-5-5	-	Semiconductor devices - Part 5-5: Optoelectronic devices - Photocouplers	EN IEC 60747-5-5	-

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IEC 60747-17	-	Semiconductor devices - Part 17: Magnetic and capacitive coupler for basic and reinforced insulation	EN IEC 60747-17	-
IEC 60851-5	-	Winding wires - Test methods - Part 5: Electrical properties	EN 60851-5	-
IEC 61010-1	-	Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements	EN 61010-1	-
IEC 61158-2	-	Industrial communication networks - Fieldbus specifications - Part 2: Physical layer specification and service definition	EN IEC 61158-2	-
IEC 61810-1	-	Electromechanical elementary relays - Part 1: General and safety requirements	EN 61810-1	-
IEC 62133-2	-	Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for portable sealed secondary lithium cells, and for batteries made from them, for use in portable applications - Part 2: Lithium systems	EN 62133-2	-
ANSI/UL 248	series	Standard for low-voltage fuses	-	series
ANSI/UL 746E	-	Polymeric Materials - Industrial Laminates, Filament Wound Tubing, Vulcanized Fibre, and Materials Used In Printed Wiring Boards	-	-
UL 810A	-	Standard for Electrochemical Capacitors	-	-
DIN VDE V 0884-11	-	Semiconductor devices - Part 11: Magnetic and capacitive coupler for basic and reinforced isolation	-	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

IEC 60079-11
Edition 7.0 2023-01

EXPLOSIVE ATMOSPHERES –

Part 11: Equipment protection by intrinsic safety "i"

I N T E R P R E T A T I O N S H E E T 1

This interpretation sheet has been prepared by subcommittee 31G: Intrinsically-safe apparatus, of IEC technical committee 31: Equipment for explosive atmospheres.

The text of this interpretation sheet is based on the following documents:

DISH	Report on voting
31G/392/DISH	31G/397/RVDISH

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

IEC 60079-11:2023 (Edition 7.0)

Explosive atmospheres – Part 11: Equipment protection by intrinsic safety “i”

Background

5.4.1 of IEC 60079-11:2023 states, in part:

All surfaces of intrinsically safe apparatus that come into contact with explosive atmospheres shall be assessed to ensure that, under the conditions specified in 5.2, the apparatus complies with the maximum surface temperature requirements of IEC 60079-0.

Question

Is "all surfaces of intrinsically safe apparatus that come into contact with explosive atmospheres", as referenced in 5.4.1 for thermal ignition compliance, intended to mean the junction temperature of a sealed semiconductor?

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Answer

No. It is not necessary to consider temperatures within a sealed semiconductor for thermal ignition compliance. It is not necessary to test a packaged component to confirm sealing. It is not necessary for the packaging of such a component to conform to the encapsulation requirements of IEC 60079-11.

An example of a sealed semiconductor is one which is fabricated into a package by the semiconductor manufacturer using moulding or an equivalent process, such that the explosive atmosphere is excluded, such as SOIC, DIP, QFN, SOT.

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IEC 60079-11
Edition 7.0 2023-01

EXPLOSIVE ATMOSPHERES –

Part 11: Equipment protection by intrinsic safety "i"

INTERPRETATION SHEET 2

This interpretation sheet has been prepared by subcommittee 31G: Intrinsically-safe apparatus, of IEC technical committee 31: Equipment for explosive atmospheres.

The text of this interpretation sheet is based on the following documents:

DISH	Report on voting
31G/393/DISH	31G/398/RVDISH

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

IEC 60079-11:2023 (Edition 7.0)

Explosive atmospheres – Part 11: Equipment protection by intrinsic safety “i”

Background

Table 22, "Rating and failure modes of PPTC devices used to limit current", includes ITRIP as a parameter requiring a safety factor of 1,0.

Question 1

Where Table 22 applies a safety factor of 1,0 for ITRIP, is external current limitation required to achieve the safety factor?

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Answer 1

No. A PPTC may be considered to self-limit the current for the purpose of achieving the required safety factor. Faults still need to be applied according to Table 22.

Question 2

Does IEC 60079-11 permit a PPTC device to be used to limit current for the purpose of spark ignition compliance?

Answer 2

No. Subclause 7.16.3 only permits the use of a PPTC device to limit current for the purposes of thermal ignition compliance, power rating of components, and the determination of P_o .

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IEC 60079-11
Edition 7.0 2023-01

EXPLOSIVE ATMOSPHERES –

Part 11: Equipment protection by intrinsic safety “i”

I N T E R P R E T A T I O N S H E E T 3

This interpretation sheet has been prepared by subcommittee 31G: Intrinsically-safe apparatus, of IEC technical committee 31: Explosive atmospheres.

The text of this interpretation sheet is based on the following documents:

DISH	Report on voting
31G/400/DISH	31G/403/RVDISH

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

IEC 60079-11 Edition 7.0 2023

EXPLOSIVE ATMOSPHERES – Part 11: Equipment protection by intrinsic safety “i”

Background

Devices which read from memory during operation are clearly programmable components and need to be considered according to 7.7.8. IEC 60079-11 is not clear whether a component which only reads from memory or internal registers during initialisation – such as a digital potentiometer – is a programmable component according to 7.7.8 or a simpler semiconductor which can be considered according to 7.7.2.

Question

Can a digital potentiometer (or other similar device) which relies on reading from memory or an internal register only during initialization to set the resistance value be used as a component on which intrinsic safety depends for Levels of Protection “ia” and “ib”?

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Answer

No. Such a device is considered a programmable component according to 7.7.8 and its failure modes should be considered accordingly. Memory is fundamental to the main function of the component.

Digital potentiometers (or other similar devices) which can be used as components on which intrinsic safety depends according to 7.7.2 include those which:

- 1) have their resistance (or other value) set during manufacture of the equipment or component (for example configuration fuse bits or laser trimming),
- 2) do not rely on reading from memory or internal registers which are designed to be reprogrammable to set the resistance, and;
- 3) cannot be modified by the end user of the equipment.

NOTE Requirements for components which read from memory during initialization are under consideration for the next edition of IEC 60079-11.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

EXPLOSIVE ATMOSPHERES –

Part 11: Equipment protection by intrinsic safety "i"

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

This seventh edition cancels and replaces the sixth edition published in 2011. This edition constitutes a technical revision.