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Supersedes ANSI/ISA-12.16.01-1998 (IEC 60079-7 Mod)

Electrical Apparatus for Use in Class I, Zone 1 Hazardous (Classified) Locations: Type of Protection - Increased Safety "e"

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Commitment for Amendments

This Standard is issued jointly by ISA — The Instrumentation, Systems, and Automation Society (ISA) and Underwriters Laboratories Incorporated (UL). Amendments to this Standard will be made only after processing according to the Standards writing procedures by ISA and UL.

The most recent designation of ANSI/UL 60079-7 and ANSI/ISA-60079-7 as an American National Standard occurred on 2 December 2002.

This ANSI/UL Standard for Safety, which consists of the first edition is under continuous maintenance, whereby each revision is ANSI approved upon publication. Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Written comments are to be sent to the UL-RTP Standards Department, 12 Laboratory Drive, Research Triangle Park, NC 27709.

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Revisions of this standard will be made by issuing revised or additional pages bearing their date of issue. A UL standard is current only if it incorporates the most recently adopted revisions, all of which are itemized on the transmittal notice that accompanies the latest set of revised requirements.

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**ISA — The Instrumentation, Systems,
and Automation Society**
ANSI/ISA-60079-7
First Edition

Underwriters Laboratories Inc.
ANSI/UL 60079-7
First Edition



**ISA—The Instrumentation, Systems,
and Automation Society**



**Electrical Apparatus for Use in Class I, Zone 1 Hazardous
(Classified) Locations: Type of Protection — Increased
Safety “e”**

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General Notes

This is the common ISA and UL Standard for Electrical apparatus for explosive gas atmospheres – Part 7: Increased Safety "e". It is the first edition of ANSI/ISA-60079-7 [formerly ANSI/ISA-12.16.01-1998 (IEC 60079-7 Mod)] and the first edition of UL 60079-7. The suffix "Mod" indicates the document is a modification of the IEC document and includes U.S. deviations encompassing both additions and deletions of information.

ANSI/ISA-60079-7 and UL 60079-7 contain identical requirements, and identical publication dates. The presentation and format of the standards material may differ between the two published standards.

This common Standard was prepared by ISA — The Instrumentation, Systems, and Automation Society and Underwriters Laboratories Inc. (UL).

Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.

Level of harmonization

This standard adopts the IEC text with deviations.

The requirements are presented in different formats. The ISA version of the standard illustrates the national differences from the IEC text through the use of legislative text (strike-out and underline). The UL version of the standard illustrates national differences immediately following the IEC text. National differences between the UL version and the ISA version shall be word for word except for editorial changes.

Interpretations

The interpretation by the SDO of an identical or equivalent standard shall be based on the literal text to determine compliance with the standard in accordance with the procedural rules of the SDO. If more than one interpretation of the literal text has been identified, a revision shall be proposed as soon as possible to each of the SDOs to more accurately reflect the intent.

UL Effective Date

As of 2 December 2002 all products Listed or Recognized by UL must comply with the requirements in this Standard.

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Preface (ISA)

This ISA standard is based on IEC Publication 60079-7. It is the intention of the ISA SP12 Committee to develop an ANSI Standard that is harmonized with IEC 60079-7 to the fullest extent possible.

This preface is included for informational purposes and is not part of ANSI/ISA-60079-7. The document is a modification of the IEC document and includes U.S. deviations encompassing both additions and deletions of information.

The standards referenced within this document may contain provisions which, through reference in this text, constitute requirements of this document. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this document are encouraged to investigate the possibility of applying the most recent editions of the standards indicated within this document. Members of IEC and ISO maintain registers of currently valid International Standards. ANSI maintain registers of currently valid U.S. National Standards.

This document has been prepared as part of the service of ISA—The Instrumentation, Systems, and Automation Society, toward a goal of uniformity in the field of instrumentation. To be of real value, this document should not be static but should be subject to periodic review. Toward this end, the Society welcomes all comments and criticisms and asks that they be addressed to the Secretary, Standards and Practices Board; ISA; 67 Alexander Drive; P. O. Box 12277; Research Triangle Park, NC 27709; Telephone (919) 549-8411; Fax (919) 549-8288; E-mail: standards@isa.org.

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Foreword (UL)

A. This Standard contains basic requirements for products covered by Underwriters Laboratories Inc. (UL) under its Follow-Up Service for this category within the limitations given below and in the Scope section of this Standard. These requirements are based upon sound engineering principles, research, records of tests and field experience, and an appreciation of the problems of manufacture, installation, and use derived from consultation with and information obtained from manufacturers, users, inspection authorities, and others having specialized experience. They are subject to revision as further experience and investigation may show is necessary or desirable.

B. The observance of the requirements of this Standard by a manufacturer is one of the conditions of the continued coverage of the manufacturer's product.

C. A product which complies with the text of this Standard will not necessarily be judged to comply with the Standard if, when examined and tested, it is found to have other features which impair the level of safety contemplated by these requirements.

D. A product that contains features, characteristics, components, materials, or systems new or different from those covered by the requirements in this standard, and that involves a risk of fire or of electric shock or injury to persons shall be evaluated using appropriate additional component and end-product requirements to maintain the level of safety as originally anticipated by the intent of this standard. A product whose features, characteristics, components, materials, or systems conflict with specific requirements or provisions of this standard does not comply with this standard. Revision of requirements shall be proposed and adopted in conformance with the methods employed for development, revision, and implementation of this standard.

E. UL, in performing its functions in accordance with its objectives, does not assume or undertake to discharge any responsibility of the manufacturer or any other party. The opinions and findings of UL represent its professional judgment given with due consideration to the necessary limitations of practical operation and state of the art at the time the Standard is processed. UL shall not be responsible to anyone for the use of or reliance upon this Standard by anyone. UL shall not incur any obligation or liability for damages, including consequential damages, arising out of or in connection with the use, interpretation of, or reliance upon this Standard.

F. Many tests required by the Standards of UL are inherently hazardous and adequate safeguards for personnel and property shall be employed in conducting such tests.

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National Differences

GENERAL

In the UL publication of this standard, National Differences from the text of International Electrotechnical Commission (IEC) Publication 60079-7 Electrical apparatus for explosive gas atmospheres — Part 7: Increased Safety "e", copyright 2001, are indicated by notations (differences) and are presented in bold text. The national difference type is included in the body.

In the ISA publication of this standard, National Differences are presented using legislative text (strike-out and underline). The national difference type is identified in an informative annex.

There are five types of National Differences as noted below. The standard may not include all types of these National Differences.

NOTE The UL printed standard includes the national difference types within the body of the text. The ISA printed standard includes the national difference types in an annex at the back of the standard.

DR – These are National Differences based on the National Electrical Code (NEC) and other U.S. Regulatory Requirements.

D1 – These are National Differences based on **basic safety principles and requirements**, elimination of which would compromise safety for U.S. consumers and users of products.

D2 – These are National Differences based on **safety practices**. These are differences for IEC requirements that may be acceptable, but adopting the IEC requirements would require considerable retesting or redesign on the manufacturer's part.

DC – These are National Differences based on the **component standards** and will not be deleted until a particular component standard is harmonized with the IEC component standard.

DE – These are National Differences based on **editorial comments or corrections**.

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Foreword (ISA)

All text of IEC 60079-7:2001 is included. U.S. National Deviations are shown by ~~strikeout~~ through text deleted and underline under text added. Tables, or portions of tables, that are to be deleted are shown as shaded; figures to be deleted are marked with the overlay "X." There are ten annexes in this standard. Annexes C, D, E, F, G, H, I, and J are informative and are not considered part of this standard. Annexes A and B are normative and are considered part of this standard.

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1 Scope

This part of ~~IEC 60079~~ ANSI/ISA-60079-7 specifies the requirements for the design, construction, testing and marking of electrical apparatus with type of protection increased safety "e" intended for use in Class I, Zone 1, Groups IIA, IIB, and IIC hazardous (classified) location explosive gas atmospheres. This standard applies to electrical apparatus with a rated value of supply voltage not exceeding 11 kV r.m.s. a.c. or d.c. Additional measures are applied to ensure that the apparatus does not produce arcs, sparks, or excessive temperatures in normal operation or under specified abnormal conditions.

These specific requirements are additional to the general requirements in ANSI/ISA-60079-0 ~~IEC 60079-0~~ that apply to type of protection increased safety "e" unless specifically excluded.

2 ~~Normative~~ References

The following ~~normative~~ documents may contain provisions which, through reference in this text, constitute provisions of this ~~part of IEC 60079 standard~~ part of IEC 60079 standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this ~~part of IEC 60079 standard~~ part of IEC 60079 standard are encouraged to investigate the possibility of applying the most recent editions of the ~~normative~~ documents indicated below. For undated references, the latest edition of the ~~normative~~ document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards. ANSI maintains registers of currently valid U.S. National Standards.

IEC 60034-1, Rotating electrical machines, Part 1: Rating and performance

IEC 60034-5, Rotating electrical machines, Part 5: Degrees of protection provided by internal design of rotating electrical machines (IP code) – Classification

IEC 60044-6, Instrument transformers – Part 6: Requirements for protective current transformers for transient performance

IEC 60050(426), International Electrotechnical Vocabulary (IEV) – Chapter 426: Electrical apparatus for explosive atmospheres

IEC 60050(486), International Electrotechnical Vocabulary (IEV) – Chapter 486: Secondary cells and batteries

IEC 60061-1, Lamp caps and holders together with gauges for the control of interchangeability and safety – Part 1: Lamp caps

IEC 60061-2, Lamp caps and holders together with gauges for the control of interchangeability and safety – Part 2: Lampholders

IEC 60064, Tungsten filament lamps for domestic and similar general lighting purposes – Performance requirements

IEC 60068-2-6, Environmental testing – Part 2: Tests – Test Fc: Vibration (sinusoidal)

IEC 60068-2-27: 1987, Environmental testing, Part 2: Tests – Test Ea and guidance: Shock

IEC 60068-2-42, Environmental testing, Part 2: Test Kc – Sulphur dioxide test for contacts and connections

~~IEC 60079-0: 1998, Electrical apparatus for explosive gas atmospheres – Part 0: General requirements~~