ANSI/ISA-60079-11 (12.02.01)-2013

Supersedes ANSI/ISA-60079-11 (12.02.01)-2012

Explosive Atmospheres – Part 11: Equipment protection by intrinsic safety “i” (Edition 6.1)

Approved 6 September 2013

Commitment for Amendments

This standard is issued jointly by ISA and Underwriters Laboratories Incorporated (UL). Comments or proposals for revisions on any part of the standard may be submitted to ISA or UL at any time. Revisions to this standard will be made only after processing according to the standards development procedures of ISA and UL. ***ISA and UL will issue revisions to this standard by means of a new edition or revised or additional pages bearing their date of issue.***

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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.

The most recent designation of ANSI/ISA-60079-11 and ANSI/UL 60079-11 as American National Standards occurred on 6 September 2013.

This ANSI/UL Standard for Safety, which consists of the sixth 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. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at http://csds.ul.com.

ISA
ANSI/ISA–60079-11
Edition 6.1

Underwriters Laboratories Inc.
ANSI/UL 60079-11
Edition 6

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

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General Notes

This is the common ISA and UL standard for Explosive atmospheres - Part 11: Equipment protection by intrinsic safety “i”. It is edition 6.1 of ANSI/ISA-60079-11 (superseding ANSI/ISA-60079-11-2012) and edition 6 of ANSI/UL 60079-11.

ANSI/ISA-60079-11 and ANSI/UL 60079-11 contain identical requirements, with the publication date of. The presentation and format of the standards material may differ between the two published standards.

This common standard was prepared by ISA 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

The effective date for UL is the date of publication. However, the fifth edition of UL 60079-11 will also be effective until 1 September 2018.

A UL effective date is one established by Underwriters Laboratories Inc. and is not part of the ANSI approved standard.

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Preface (ISA)

This ISA standard is based on the 6th edition of IEC Publication 60079-11 including Corrigendum 1. It is the intention of the ISA12 Committee to develop an ANSI Standard that is harmonized with IEC 60079-11 to the fullest extent possible. This preface is included for informational purposes and is not part of ANSI/ISA-60079-11. The document is a modification of the IEC document and includes U.S. deviations encompassing both additions and deletions of information.

The entire text of IEC 60079-11:2011 is included in this document including Corrigendum 1. U.S. National Deviations are shown by strikeout through deleted text and underlining of added text. Tables, or portions of tables, that are to be deleted are shown as shaded; figures to be deleted are marked with the overlay "X." Some tables have been reformatted to allow for US standard paper sizes. There are ten annexes in this standard. Annexes A, B, D, F and G are normative and form part of the requirements of this standard. Annexes C, E, H, I and J are informative and are not considered part of this standard.

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

- Inclusion of non-edition specific references to ANSI/ISA-60079-0.
- The merging of the apparatus requirements for FISCO from ANSI/ISA-60079-27.
- The merging of the requirements for combustible dust atmospheres from ANSI/ISA-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 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 maintains registers of currently valid U.S. National Standards.

This document has been prepared as part of the service of ISA 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.

The ISA Standards and Practices Department is aware of the growing need for attention to the metric system of units in general, and the International System of Units (SI) in particular, in the preparation of instrumentation standards. The Department is further aware of the benefits to USA users of ISA standards of incorporating suitable references to the SI (and the metric system) in their business and professional dealings with other countries. Toward this end, this Department will endeavour to introduce SI-acceptable metric units in all new and revised standards, recommended practices, and technical reports to the greatest extent possible. IEEE/ASTM SI 10, *American National Standard for Metric Practice*, and future revisions, will be the reference guide for definitions, symbols, abbreviations, and conversion factors.

It is the policy of ISA to encourage and welcome the participation of all concerned individuals and interests in the development of ISA standards, recommended practices, and technical reports. Participation in the ISA standards-making process by an individual in no way constitutes endorsement by the employer of that

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National Differences

GENERAL

National Differences from the text of International Electrotechnical Commission (IEC) Publication 60079-11, Explosive Atmospheres – Part 11: Equipment Protection by Intrinsic Safety ″i″ copyright 2011, are indicated by notations (differences) and are presented in bold text.

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 difference type is noted on the first line of the National Difference in the standard. The standard may not include all types of these National Differences.

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.

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

D2 – These are national differences from IEC requirements based on existing **safety practices**. These requirements reflect national safety practices, where empirical substantiation (for the IEC or national requirement) is not available or the text has not been included in the IEC standard.

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**.

DR – These are National Differences based on the **national regulatory requirements**.

Each national difference contains a description of what the national difference entails. Typically one of the following words is used to explain how the text of the national difference is to be applied to the base IEC text:

Addition / Add - An addition entails adding a complete new numbered clause, subclause, table, figure, or annex. Addition is not meant to include adding select words to the base IEC text.

Deletion / Delete - A deletion entails complete deletion of an entire numbered clause, subclause, table, figure, or annex without any replacement text.

Modification / Modify - A modification is an altering of the existing base IEC text such as the addition, replacement or deletion of certain words or the replacement of an entire clause, subclause, table, figure, or annex of the base IEC text.

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CONTENTS

EXPLOSIVE ATMOSPHERES –

Part 11: Equipment protection by intrinsic safety "i"

1 Scope

This standard ~~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 ANSI/ISA-60079-0 ~~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 ISA-60079-25 ~~IEC 60079-25~~.

This standard supplements and modifies the general requirements of ANSI/ISA-60079-0 ~~IEC 60079-0~~, except as indicated in Table 1. Where a requirement of this standard conflicts with a requirement of ANSI/ISA-60079-0 ~~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 ANSI/ISA-60079-0 ~~IEC 60079-0~~, and then the requirements of that method of protection together with the relevant parts of ANSI/ISA-60079-0 ~~IEC 60079-0~~, also apply to the associated apparatus.