UL 60079-47:2022 (R2026)

(IEC 60079-47:2021, MOD)

STANDARD FOR SAFETY

Explosive Atmospheres – Part 47: Equipment Protection by 2-Wire Intrinsically Safe Ethernet Concept (2-WISE)

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UL Standard for Safety for Explosive Atmospheres – Part 47: Equipment Protection by 2-Wire Intrinsically Safe Ethernet Concept (2-WISE), UL 60079-47

First Edition, Dated March 15, 2022

Summary of Topics

This reaffirmation of ANSI/UL 60079-47 dated August 20, 2026 is issued to update the title page to reflect the most recent designation as a Reaffirmed American National Standard (ANS). No technical changes have been made.

UL 60079-47 is an adoption of IEC TS 60079-47, (first edition, issued by IEC February 2021). Please note that the National Difference document incorporates all of the U.S. national differences for UL 60079-47.

Text that has been changed in any manner or impacted by ULSE's electronic publishing system is marked with a vertical line in the margin.

The requirements are substantially in accordance with Proposal(s) on this subject dated July 3, 2026.

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MARCH 15, 2022
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UL 60079-47:2022 (R2026)

(IEC 60079-47:2021, MOD)

Standard for Explosive Atmospheres – Part 47: Equipment Protection by 2-Wire Intrinsically Safe Ethernet Concept (2-WISE)

First Edition

March 15, 2022

This ANSI/UL Standard for Safety consists of the First Edition including revisions through August 20, 2026.

The most recent designation of ANSI/UL 60079-47 as a Reaffirmed American National Standard (ANS) occurred on August 20, 2026. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page (front and back), or the Preface. The National Difference Page and IEC Foreword are also excluded from the ANSI approval of IEC-based standards.

Comments or proposals for revisions on any part of the Standard may be submitted to ULSE at any time. Proposals should be submitted via a Proposal Request in the Collaborative Standards Development System (CSDS) at https://csds.ul.org.

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Preface (UL)

This UL Standard is based on IEC Publication 60079-47: First edition Explosive atmospheres – Part 47: Equipment protection by 2-wire intrinsically safe Ethernet concept (2-WISE). IEC publication 60079-47 is copyrighted by the IEC.

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Note – 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.

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National Differences

National Differences from the text of International Electrotechnical Commission (IEC) Publication 60079-47, Explosive Atmospheres – Part 47: Equipment Protection by 2-Wire Intrinsically Safe Ethernet Concept (2-WISE), copyright 2021, are indicated by notations (differences) and are presented in bold text. The national difference type is included in the body.

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.

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

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**.

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.

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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FOREWORD

INTERNATIONAL ELECTROTECHNICAL COMMISSION

EXPLOSIVE ATMOSPHERES – Part 47: Equipment protection by 2-wire intrinsically safe Ethernet concept (2-WISE)

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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Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 60079-47, which is a technical specification, has been prepared by subcommittee 31G: Intrinsically safe apparatus, of IEC technical committee 31: Equipment for explosive atmospheres.

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The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
31G/323/DTS	31G/334/RVC

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

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

A list of all parts in the IEC 60079 series, published under the general title *Explosive 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,

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• amended.

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EXPLOSIVE ATMOSPHERES – Part 47: Equipment protection by 2-wire intrinsically safe Ethernet concept (2-WISE)

1 Scope

1DV *Modification of Clause 1 to replace with the following:*

1DV.1 DE This ~~part of IEC 60079, which is a technical specification,~~ document specifies requirements for the construction, marking and documenting of apparatus, systems and installations for use with the 2-Wire Intrinsically Safe Ethernet concept (2-WISE), such as the physical layer specification for 2-Wire Ethernet 10BASE-T1L as defined in IEEE 802.3cg.

2-WISE is a concept for an advanced physical layer (APL), designed to simplify the examination process for intrinsic safety parameters of components and cabling within APL segments. This is achieved by defining universal intrinsic safety parameter limits for APL ports, according to the specific hazardous area requirements and listing a concise set of rules for the segment setup.

1DV.2 DR The requirements for construction and installation of 2-WISE devices and systems are included in ~~IEC 60079-11~~ UL 60079-11, ~~IEC 60079-14~~ NFPA 70, National Electrical Code (NEC), and ~~IEC 60079-25~~ UL 60079-25, except as modified by this document. Parts of a 2-WISE device can be protected by any Type of Protection listed in ~~IEC 60079-0~~ UL 60079-0 appropriate to the EPL for the intended hazardous area. In these circumstances, the requirements of this ~~technical specification~~ document apply only to intrinsically safe circuits of the apparatus.

1DV.3 DR Where a requirement of this document conflicts with a requirement of ~~IEC 60079-0~~ UL 60079-0, ~~IEC 60079-11~~ UL 60079 11, ~~IEC 60079-14~~ NFPA 70 or ~~IEC 60079-25~~ UL 60079-25, the requirements of this document take precedence.

1DV.4 DE Where references are made to IEC and ISO standards, the referenced requirements found in these standards shall apply as modified by any applicable US National Differences for the standard (see Clause 2).

2 Normative references

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.

2DV DR *Modification of Clause 2 references to replace with the following:*

~~IEC 60079-0, Explosive atmospheres – Part 0: Equipment - General requirements~~

~~IEC 60079-11, Explosive atmospheres – Part 11: Equipment protection by intrinsic safety "i"~~

~~IEC 60079-14, Explosive atmospheres – Part 14: Electrical installations design, selection and erection~~

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~~**IEC 60079-25, *Explosive atmospheres – Part 25: Intrinsically safe electrical systems***~~

NFPA 70, *National Electrical Code* (NEC)

UL 60079-0, *Explosive atmospheres – Part 0: Equipment – General requirements*

UL 60079-11, *Explosive atmospheres – Part 11: Equipment protection by intrinsic safety "i"*

UL 60079-25, *Explosive atmospheres – Part 25: Intrinsically safe electrical systems*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60079-0, IEC 60079-11, IEC 60079-14, IEC 60079-25 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

• IEC Electropedia: available at http://www.electropedia.org/

• ISO Online browsing platform: available at http://www.iso.org/obp

3.1
10BASE-T1L
physical layer standard for 10 Mb/s Ethernet communication over a single balanced twisted-pair copper cabling with optional provision of power

Note 1 to entry: This is standardized in IEEE 802.3cg.

3.2
Advanced Physical Layer
APL
physical layer based on 10BASE-T1L

3.3
2-Wire Intrinsically Safe Ethernet
2-WISE
intrinsically safe electrical devices and system based on APL with standardized limits for intrinsic safety parameters at each port

3.4
2-WISE device
electrical equipment, either intrinsically safe apparatus or associated apparatus, that provides at least one 2-WISE compliant port

3.5
2-WISE system
assembly of interconnected items of 2-WISE devices, described in a descriptive system document, in which the circuits or parts of the circuits, intended to be used in an explosive atmosphere, are intrinsically safe circuits

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