SLOVENSKI STANDARD
oSIST prEN IEC 60079-29-0:2024

01-september-2024

Eksplozivne atmosfere - 29-0. del: Javljalniki plina - Splošne zahteve in preskusne metode, in morebitni dodatni deli

Explosive atmospheres - Part 29-0: Gas detectors - General requirements and test methods, and possible supplementary parts

Ta slovenski standard je istoveten z: **prEN IEC 60079-29-0:2024**

ICS:

13.320	Alarmni in opozorilni sistemi	Alarm and warning systems
29.260.20	Električni aparati za eksplozivna ozračja	Electrical apparatus for explosive atmospheres

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31/1784/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER:	
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IEC TC 31 : EQUIPMENT FOR EXPLOSIVE ATMOSPHERES

SECRETARIAT:	SECRETARY:
United Kingdom	Mr Tom Stack
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: ☐
	Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.

FUNCTIONS CONCERNED:

☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☒ SAFETY

☒ SUBMITTED FOR CENELEC PARALLEL VOTING	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING
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TITLE:

Explosive atmospheres - Part 29-0: Gas detectors - General requirements and test methods, and possible supplementary parts.

PROPOSED STABILITY DATE: 2029

NOTE FROM TC/SC OFFICERS:

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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EXPLOSIVE ATMOSPHERES - Part 29-0: Gas detection equipment – General requirements and test methods

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International Standard IEC 60079-29-0 has been prepared by the IEC technical committee 31: Equipment for explosive atmospheres.

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

FDIS	Report on voting

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available

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Users of this document are advised that interpretation sheets clarifying the interpretation of this document can be published. Interpretation sheets are available from the IEC webstore and can be found in the “history” tab of the page for each document.

A list of all parts in the IEC 60079-29 series 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
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INTRODUCTION

This part of IEC 60079-29 is prepared for combining the requirements for flammable, oxygen and toxic gas detection equipment to be used in industrial or commercial applications and intended to measure the concentration or the integral concentration of gases and vapours to provide an indication, alarm or other output functions for personnel safety or property protection. This document also includes test methods and acceptance criteria for performance of gas detection equipment whose primary purpose is to provide an indication, alarm or other output function.

Because a wide range of conditions can be encountered in practice, this part specifies requirements to be fulfilled by gas detection equipment when tested under prescribed laboratory conditions.

General and performance requirements for toxic gas detection equipment intended for occupational exposure measurement in the region of Occupational Exposure Limit Values is set out in IEC 62990-1 as for Type HM gas detection equipment.

Consideration should also be given to the following relevant standards:

IEC 60079-29-2: *Explosive atmospheres – Part 29-2, Gas detectors – Selection, installation, use and maintenance of detectors for flammable gases and oxygen.*

IEC 62990-2: Workplace atmospheres — Part 2: Gas detectors — Selection, installation, use and maintenance of detectors for toxic gases and vapours.

IEC 60079-29-3: *Explosive atmospheres – Part 29-3, Gas detectors – Guidance on functional safety of fixed gas detection systems.*

Part 29-0: Gas detection equipment – General requirements and test methods

1 Scope

This part of IEC 60079-29 specifies general requirements, test methods and acceptance criteria that apply to flammable, oxygen and toxic gas detection equipment intended to detect gases and vapours and to provide an indication, alarm or other output function for personnel or property protection in industrial and commercial applications.

NOTE 1 The term Gas Detection Equipment is often referred to as the term Gas Detector.

NOTE 2 The term ‘gas’ and ‘gases’ used in this document are also intended to include ‘vapour’ and ‘vapours’.

This document applies to the following gas detection equipment:

- Gas detection equipment Type “FL” intended for the detection of flammable gases:
  - Group I, in mines susceptible to firedamp;
  - Group II, in locations other than mines susceptible to firedamp; and
  - Type FL-OP, open path gas detection equipment for flammable gases.
- Gas detection equipment Type “O2” intended for the detection of Oxygen:
  - Type O2-DE, detection of oxygen deficiency or oxygen enrichment; and
  - Type O2-IN, inertisation as measuring function for explosion protection.

    NOTE 3 Inertisation is an explosion protection technique where an explosive atmosphere is purged with inert gas.
- Gas detection equipment Type “TX” intended for the detection of toxic gases:
  - Type TX-SM, detection in areas for general applications (for example, safety monitoring, leak detection), and typically using alarm signalling;
  - Type TX-HM, occupational exposure measurement in the region of occupational exposure limit values; and

    NOTE 4 Type TX-HM gas detection equipment performance requirements reside in IEC 62990-1.
  - Type TX-OP, open path gas detection equipment for toxic gases.

NOTE 5 This standard addresses equipment giving a level of performance suitable for general purpose applications. Specific applications might additionally require equipment to be submitted for particular tests or approval. Such tests or approval are regarded as additional to and separate from the compliance with this document.

This document is not applicable to equipment:

– used for medical applications;
– used only in laboratories for analysis or measurement;
– used only for process monitoring or control purposes (such as a gas analyser);
– used in the domestic environment;
– used in environmental air pollution monitoring;
– used for flue gas analysis;
– used for sampling systems external to the gas detection equipment;
– with samplers and concentrators such as sorbents or paper tape having an irreversible indication;

– consisting of a passive optical receiver without a dedicated optical source.

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.

IEC 62990-1, *Workplace atmospheres - Part 1: Gas detectors - Performance requirements of detectors for toxic gases*

IEC 62990-2, *Workplace atmospheres – Part 2: Gas detectors – Selection, installation, use and maintenance of detectors for toxic gases and vapours*

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

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

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 61000-4-29, *Electromagnetic compatibility (EMC) – Part 4-29: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations on d.c. input power port immunity tests*

IEC 61326-1:2020, *Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements*

IEC 80079-20-1, *Explosive atmospheres – Part 20: Material characteristics for gas and vapour classification, Section 1: Test methods and data*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1
gas properties

3.1.1
ambient air, <gas detection>
normal atmosphere surrounding the equipment

3.1.2
clean air, <gas detection>
air that is free of gases or vapours to which the sensor is sensitive or which influence the performance of the sensor

3.1.3
reference air, <gas detection>
air with an oxygen volume fraction of (21 ± 0,4) %

3.1.4
zero test gas, <gas detection>
gas, that is free of the gas(es) to be measured and interfering and contaminating substances, the purpose of which is calibration/adjustment of the equipment zero

3.1.5
standard test gas, <gas detection>
test gas with a composition specified to be used for all tests unless otherwise stated

3.1.6
flammable gas, <gas detection>
DEPRECATED: combustible gas
gas or vapour which, when mixed with air in a certain proportion, will form an explosive atmosphere

Note 1 to entry: For the purposes of this part of IEC 60079-29, the term "flammable gas" includes flammable vapours.

[SOURCE: IEC 600790-10-1:2020 with “or vapour” dropped from term and one note to entry added. Admitted and deprecated terms also added]

3.1.7
toxic gas, <gas detection>
gas or vapour that can be harmful to human health and/or the performance of persons due to its physical or physico-chemical properties

3.1.8
poisons, <gas detection>
<for sensing elements> substances that lead to temporary or permanent change of performance, particularly loss of sensitivity of the sensing element

3.1.9
volume fraction (*V/V*)
quotient of the volume of a specified component and the sum of the volumes of all components of a gas mixture before mixing

Note 1 to entry: The volume fraction and volume concentration take the same value if, at the same state conditions, the sum of the component volumes before mixing and the volume of the mixture are equal. However, because the mixing of two or more gases at the same state conditions is usually accompanied by a slight contraction or, less frequently, a slight expansion, this is not generally the case.

Note 2 to entry: All volumes are with respect to the pressure and the temperature of the gas mixture.

3.2
structure (or composition) of gas detection equipment

3.2.1
alarm-only equipment, <gas detection>
equipment with an alarm but not having an indication of measured value

3.2.2
aspirated equipment, <gas detection>
equipment that samples the gas by drawing it to the gas sensor

Note 1 to entry: A hand operated or electric pump is often used to draw gas to the sensor.

3.2.3
automatically aspirated equipment, <gas detection>
aspirated equipment with an integral pump or separate pump, which is connected directly to the equipment

3.2.4
diffusion equipment, <gas detection>
equipment in which the transfer of gas from the atmosphere to the sensor takes place without aspirated flow

3.2.5
fixed equipment
equipment fastened to a support, or otherwise secured in a specific location when energized

[SOURCE: IEC 60079-0:2017]

3.2.6
portable equipment, <gas detection>
equipment intended to be carried by a person during its operation

Note 1 to entry: Portable equipment carried by a person during its operation is sometimes referred to as hand-held equipment.

Note 2 to entry: Hand-held gas detection equipment, typically less than 1 kg, requires use of only one hand to operate. Larger equipment that can be operated by the user while it is carried either by hand, by a shoulder strap or carrying harness, can be equipped with or without a hand directed probe.

[SOURCE: IEC 60079-0:2017 with addition of Note 2 to entry]

3.2.7
transportable equipment
equipment not intended to be carried by a person during operation, nor intended for fixed installation

[SOURCE: IEC 60079-0:2017]

3.2.8
gas detection transmitter
fixed gas detection equipment that provides a conditioned electronic signal or output indication to a generally accepted industry standard (such as 4-20 mA), intended to be utilized with separate gas detection control units or signal processing data acquisition, central monitoring and similar systems, which typically process information from various locations and sources including, but not limited to gas detection equipment

3.2.9
gas detection control unit
equipment intended to provide display indication, alarm functions, output contacts or alarm signal outputs or any combination when operated with remote sensor(s)

3.2.10
separate gas detection control unit
equipment intended to provide display indication, alarm functions, output contacts or alarm signal outputs or any combination when operated with gas detection transmitter(s)

3.2.11
equipment with integral sensor(s), <gas detection>
equipment that provides display indication, alarm functions, output contacts or alarm signal outputs using a sensor which is within or directly assembled to the equipment housing

3.2.12
accessory, <gas detection>
component which can be fitted to the equipment for a special purpose and that is referenced in the instructions

EXAMPLE: External gas pump, sampling probe, hoses, collecting cone, weather protection device.

3.3
sensors

3.3.1
sensing element, <gas detection>
part of the sensor that is sensitive to the gas or vapour to be measured

3.3.2
measuring principle, <gas detection>
principle that makes the sensing element or the sensor sensitive to the gas or vapour to be measured

3.3.3
sensor, <gas detection>
assembly in which the sensing element is housed and that may also contain associated circuit components

3.3.4
integral sensor, <gas detection>
sensor that is within or directly assembled to the a gas detection control unit, gas, detection transmitter, or to transportable or portable equipment

3.3.5
remote sensor, <gas detection>
sensor that is installed separately, but is connected to a gas detection control unit, gas detection transmitter, or to transportable or portable equipment

3.4
supply of gas to equipment

3.4.1
sample line, <gas detection>
means by which the gas being sampled is conveyed to the sensor

Note 1 to entry: Accessories such as filters or water traps are often included in the sample line.

3.4.2
sampling probe, <gas detection>
separate accessory sample line that is optionally attached to the equipment

3.4.3
Adjustment, <gas detection>
procedure carried out to minimize the deviation of the indication from the test gas concentration

Note 1 to entry: When the equipment is adjusted to give an indication of zero in zero test gas, the procedure is called 'zero adjustment'.

3.4.4
calibration, <gas detection>
procedure that establishes the relationship between an indication and the concentration of a test gas

3.4.5
calibration kit, <gas detection>
means of presenting test gas to the equipment for the purpose of calibrating, adjusting or verifying the operation of the equipment

Note 1 to entry: The calibration kit can be used for verifying the operation of the alarms if the concentration of the test gas is beyond the alarm set-point.