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INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Explosive atmospheres – Part 29-4: Gas detectors – Performance requirements of open path detectors for flammable gases

Atmosphères explosives – Partie 29-4: Détecteurs de gaz – Exigences d'aptitude à la fonction des détecteurs de gaz inflammables à chemin ouvert

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

EXPLOSIVE ATMOSPHERES –

Part 29-4: Gas detectors – Performance requirements of open path detectors for flammable gases

FOREWORD

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International Standard IEC 60079-29-4 has been prepared by IEC technical committee 31: Equipment for explosive atmospheres.

This standard supplements and modifies the general requirements of IEC 60079-0. Where a requirement of this standard conflicts with a requirement of IEC 60079-0, the requirement of this standard shall take precedence.

The text of this standard is based on the following documents:

FDIS	Report on voting
31/819/FDIS	31/841/RVD

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

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

A list of all parts of the IEC 60079 series, under the general title: *Explosives atmospheres*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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EXPLOSIVE ATMOSPHERES –

Part 29-4: Gas detectors – Performance requirements of open path detectors for flammable gases

1 Scope

This part of IEC 60079-29 specifies performance requirements of equipment for the detection and measuring of flammable gases or vapours in ambient air by measuring the spectral absorption by the gases or vapours over extended optical paths, ranging typically from one metre to a few kilometres.

Such equipment measures the integral concentration of the absorbing gas over the optical path in units such as LFL metre for flammable gases.

NOTE 1 Actual values of concentration can be deduced only where it can be established that the concentration is uniform over the optical path, for example in very short optical paths (<100 mm). In such cases, the equipment is within the scope of IEC 60079-29-1.

NOTE 2 This standard is based upon present absorption techniques using infrared radiation. Other techniques and applications may require additional test considerations (e.g. pressure test).

Equipment falling within the scope of this standard is classified by the following types:

Type 1: an optical transmitter and receiver, located at either end of a path through the atmosphere to be monitored.

Type 2: an optical transceiver (i.e. combined transmitter and receiver) and a suitable reflector, which may be a topographic feature or a retroreflector, located at either end of a path through the atmosphere to be monitored.

This standard is also applicable when an equipment manufacturer makes any claims regarding any special features of construction or superior performance that exceed the minimum requirements of this standard. All such claims shall be verified and the test procedures should be extended or supplemented, where necessary, to verify the claimed performance. The additional tests shall be agreed between the manufacturer and the test laboratory and identified and described in the test report.

This standard does not apply to any of following:

a) equipment intended to provide range resolution of gas concentration (e.g. Light direction and ranging (LIDAR));

b) equipment consisting of a passive optical receiver without a dedicated optical source;

c) equipment intended to measure the local volumetric concentration of gas (point sensors);

d) equipment intended for the detection of dusts or mists in air;

e) equipment for cross stack monitoring;

f) equipment intended for the detection of explosives; and

g) equipment intended only for the identification of individual gas or vapour components, (e.g. Fourier transform infrared spectroscopy (FTIR)).

This standard is applicable to equipment which is intended for use in hazardous or non-hazardous areas, or both. Equipment for use in hazardous areas is also required to have explosion protection (see 4.1.1).

This standard applies to portable, transportable and fixed equipment intended for commercial and industrial applications.

NOTE 3 This standard is intended to provide for the supply of equipment giving a level of performance suitable for general purpose applications. However, for specific applications a prospective purchaser or an appropriate authority may additionally require equipment to be submitted for particular tests or approval. Such tests or approval are regarded as additional to and separate from the provisions of the standards referred to above.

2 Normative references

The following referenced documents are indispensable for the application of this document. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60079 (all parts), *Explosive atmospheres*

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

IEC 60079-29-1, *Explosive atmospheres – Part 29-1: Gas detectors – Performance requirements of detectors for flammable gases*

IEC 60825-1, *Safety of laser products – Part 1: Equipment classification and requirements*

IEC 61000-4-1, *Electromagnetic compatibility (EMC) – Part 4-1: Testing and measurement techniques – Overview of IEC 61000-4 series*

IEC 61000-4-3, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60079-0 as well as IEC 60079-29-1 and the following apply.

NOTE Additional definitions applicable to explosive atmospheres can be found in IEC 60050-426.

3.1 Equipment

3.1.1
alarm only equipment
equipment which generates an alarm signal but does not have a meter or output giving a measure of the integral concentration

3.1.2
fixed equipment
equipment fastened to a support, or otherwise secured in a specific location

3.1.3
transportable equipment
equipment not intended to be carried by a person nor intended for fixed installation

3.1.4
portable equipment
equipment intended to be carried by a person

NOTE Typically portable equipment will be used as a spot-reading equipment.