IEC 60079-29-1

Edition 2.0 2016-07

INTERNATIONAL STANDARD

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

IEC 60079-29-1:2016-07(en)

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

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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EXPLOSIVE ATMOSPHERES –

Part 29-1: Gas detectors – Performance requirements of detectors for flammable gases

INTERPRETATION SHEET 1

This interpretation sheet has been prepared by IEC technical committee 31: Equipment for explosive atmospheres.

The text of this interpretation sheet is based on the following documents:

DISH	Report on voting
31/1456/DISH	31/1462/RVDISH

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

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In accordance with Administrative Circular AC/42/2004: New procedures for interpretation of standards, Annex 2: New text for ISO/IEC Directives (IEC Supplement), there has been a request for formal interpretation of the Air Velocity test acceptance criterion in the performance standard IEC 60079-29-1:2016.

Question:

Is the acceptance criteria for the Air Velocity test to be assessed based upon variation from the 0 m/s reading?

Interpretation:

Some of the performance tests are intended to be an accuracy based assessment from the applied gas concentration (eg. Short Term Stability and Calibration Curve). Other performance tests are intended to be a variation based assessment from a known baseline (eg. Baseline at 20 °C for Temperature test and baseline at 100 kPa for Pressure test).

IEC 60079-29-1:2016-07/ISH1:2019-04(en)

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In review of the air velocity acceptance criteria, the format is the same as the Short Term Stability and Calibration Curve and therefore this is intended to be an accuracy based assessment.

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EXPLOSIVE ATMOSPHERES –

Part 29-1: Gas detectors – Performance requirements of detectors for flammable gases

INTERPRETATION SHEET 2

This interpretation sheet has been prepared by IEC technical committee 31: Equipment for explosive atmospheres.

The text of this interpretation sheet is based on the following documents:

DISH	Report on voting
31/1457/DISH	31/1467/RVDISH

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

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In accordance with Administrative Circular AC/42/2004: New procedures for Interpretation of standards, Annex 2: New text for ISO/IEC Directives (IEC Supplement), there has been a request for formal interpretation of the required testing for each general purpose test gas for performance standard IEC 60079-29-1:2016, Subclause 5.3.2 (c), by the Australian National Committee. The requirement is stated as follows:

c) Methane, and propane or butane for equipment intended for general purpose flammable gas detection (in order to get representative results, e.g. concerning sensitivity, response times and drift).

Question:

Is the interpretation of this text that propane or butane required tests are only Calibration and adjustment (5.4.3), Short-term stability (5.4.4.2), and Time of response (5.4.15)?

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ICS 29.260.20

Interpretation:

No, for general purpose equipment evaluation to two gases is essential in order to get representative test results. Therefore, all tests need to be conducted for the two gases unless otherwise specified (e.g. EMC as outlined in IEC 60079-29-1/AMD1:—[1]).

[1] Under preparation. Stage at the time of publication: IEC/CCDV 60079-29-1/AMD1:2019.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Part 29-1: Gas detectors – Performance requirements of detectors for flammable gases

FOREWORD

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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International Standard IEC 60079-29-1 has been prepared by IEC technical committee 31: Equipment for explosive atmospheres.

This second edition of IEC 60079-29-1 cancels and replaces the first edition of IEC 60079-29-1:2007 series and constitutes a technical revision.

The contents of the interpretation sheets 1 and 2 (2019-04) have been included in this copy.

Significant technical changes between IEC 60079-29-1, Edition 1 (2007), and IEC 60079-29-1, Edition 2 (2016), is as listed below:

Significant changes with respect to IEC 60079-29-1:2007

		Type		
Changes	**Clause**	**Minor and editorial changes**	**Extension**	**Major technical changes**
Measuring range up to 20 %LEL (Modified requirements)	All		X	
Definitions (Additional clarifications)	3	X		
Manufacturer's claims (special applications requirements)	4.1.1	X		
General construction (Malfunction effects on safety related function)	4.2.1			C1
General indicating devices (portable equipment with visual and audible indication)	4.2.2.1			C2
Suppression of indication and measured values below zero (functional limits)	4.2.2.5			C3
Fault signals (Fault indication below minimum voltage limit, sensor disconnection and zero drift condition)	4.2.4			C4
Adjustments (Zero and sensitivity adjustments)	4.2.5			C5
Marking (Portable equipment protective case)	4.3		X	
Instruction Manual (Additions and clarifications)	4.4			C6
Samples and sequence of tests (Optical filter special sensitivity limits, and modification considerations)	5.2.2		X	
Preparation of equipment before testing (separate gas detection control units)	5.2.3	X		
Test gas (methane, and propane or butane for general purpose gas detector)	5.3.2			C7
General test methods (selectable range and wiring worst case conditions)	5.4.1		X	
Calibration curve (fixed volume fractions)	5.4.3.2			C8
Response to different gases (semiconductor and catalytic high gas concentration exposure)	5.4.3.3			C9
Stability (duration of test method)	5.4.4		X	
Alarm set point(s) (alarm set point test method)	5.4.5	X		
Temperature (portable) (temperature range and stabilization period)	5.4.6			C10
Temperature (all other equipment) (temperature range and stabilization period)	5.4.6		X	
Pressure (tolerance on pressure measurement)	5.4.7	X		
Humidity of test gas (test method clarification)	5.4.8	X		
Air velocity (test method clarification)	5.4.9	X		
Flow rate for aspirated equipment (test method clarification)	5.4.10	X		
Vibration (test method clarification)	5.4.12	X		

Changes	Clause	Type		
		Minor and editorial changes	Extension	Major technical changes
Drop test for portable and transportable equipment (Automatic re-starting or shut-down requirement clarification)	5.4.13	X		
Warm-up time (user prompt requirement)	5.4.14			C11
High gas concentration operation above the measuring range (test method and requirement clarification)	5.4.16	X		
Battery capacity (test method clarification)	5.4.17	X		
Power supply variation (minimum supply voltage fault limit)	5.4.18			C12
Poisons (applicable only to Group I apparatus with catalytic or semiconductor sensors) (test method clarification)	5.4.20.2	X		
Electromagnetic compatibility (test methods and requirements)	5.4.21			C13
Field calibration kit (test method clarification)	5.4.22	X		
Software function (supporting documentation)	5.4.23		X	
Determination of time of response (test method clarification)	Annex B		X	

NOTE 1 The technical changes referred to include the significance of technical changes in the revised IEC Standard, but they do not form an exhaustive list of all modifications from the previous version. More guidance may be found by referring to the Redline Version of the standard.

Explanations:

A) Definitions

Minor and editorial changes

Clarification decrease of technical requirements minor technical change editorial corrections.

These are changes which modify requirements in an editorial or a minor technical way. They include changes of the wording to clarify technical requirements without any technical change, or a reduction in level of existing requirement.

Extension

Addition of technical options

These are changes which add new or modify existing technical requirements, in a way that new options are given, but without increasing requirements for equipment that was fully compliant with the previous standard. Therefore, these will not have to be considered for products in conformity with the preceding edition.

Major technical changes

Addition of technical requirements increase of technical requirements.

These are changes to technical requirements (addition, increase of the level or removal) made in a way that a product conforming to the preceding edition will not always be able to fulfil the requirements given in the later edition. These changes have to be considered for products conforming to the preceding edition. For these changes additional information is provided in B) below.

NOTE 2 These changes represent current technological knowledge. However, these changes should not normally have an influence on equipment already placed on the market.

B) Information about the background of 'Major technical changes'

C1 Addition of malfunction effects not adversely affecting the safety related function (4.2.1).

C2 Addition of visual and audible indication for portable equipment (4.2.2.1).

C3 Addition of functional limits for suppression of indication and for measured values below zero (4.2.2.5).

C4 Addition of requirements for fault indication below minimum voltage limit, sensor disconnection and zero drift condition (4.2.4).

C5 Addition of requirements for zero and sensitivity adjustments (4.2.5).

C6 Addition and clarification requirements for inclusion within the instruction manual (4.4).

C7 Addition of methane and propane or butane as required test gases for general purpose gas detector (5.3.2).

C8 Specification of fixed volume fractions which are expressed as a percentage of the measuring range (5.4.3.2).

C9 Addition of requirement for semiconductor and catalytic sensors to be exposed to high gas concentration on response to different gases (5.4.3.3).

C10 Addition of temperature range and stabilization period (5.4.6).

C11 Addition of requirement where equipment prompts the user (5.4.14).

C12 Addition of requirement for output functionality above the minimum supply voltage fault limit (5.4.18).

C13 Addition of test methods and requirements for electromagnetic compatibility tests (5.4.21).

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

FDIS	Report on voting
31/1257/FDIS	31/1266/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 *Explosive atmospheres*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

This part of IEC 60079-29 specifies general requirements for construction, testing and performance, and describes the test methods that apply to portable, transportable and fixed equipment for the detection and measurement of flammable gas or vapour concentrations with air.

Guidance for the selection, installation, use and maintenance of gas detecting equipment is set out in IEC 60079-29-2: *Explosive atmospheres – Part 29-2: Gas detectors – Selection, installation, use and maintenance of detectors for flammable gases and oxygen*.

Guidance for functional safety of fixed gas detection systems is set out in IEC 60079-29-3: *Explosive atmospheres – Part 29-3: Gas detectors – Guidance on functional safety of fixed gas detection systems*.

General requirements for construction, testing and performance of open path detectors for flammable gases are set out in IEC 60079-29-4: *Explosive atmospheres – Part 29-4: Gas detectors – Performance requirements of open path detectors for flammable gases*.