AS/NZS 60079.29.1:2008
IEC 60079-29-1, Ed. 1.0 (2007)

AS/NZS 60079.29.1:2008

Australian/New Zealand Standard™

# Explosive atmospheres

# Part 29.1: Gas detectors—Performance requirements of detectors for flammable gases


This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee EL-014, Equipment for Explosive Atmospheres. It was approved on behalf of the Council of Standards Australia on 16 November 2007 and on behalf of the Council of Standards New Zealand on 16 November 2007.
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Australian/New Zealand Standard™

# Explosive atmospheres

# Part 29.1: Gas detectors—Performance requirements of detectors for flammable gases

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# PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-014, Equipment for Explosive Atmospheres, to supersede AS/NZS 61779.1 to AS/NZS 61779-5.

The objective of this Standard is to provide general requirements for construction, testing and performance, and describes the test methods that apply to portable, transportable and fixed apparatus for the detection and measurement of flammable gas or vapour concentrations with air. The apparatus, or parts thereof, are intended for use in potentially explosive atmospheres and in mines susceptible to firedamp.

This Standard is identical with, and has been reproduced from IEC 60079-29-1, Ed. 1.0 (2007), *Explosive atmospheres – Part 29-1: Gas detectors—Performance requirements of detectors for flammable gases*.

This first edition of AS/NZS 60079.29.1 supersedes AS/NZS 61779.1 to AS/NZS 61779.5 (inclusive) and constitutes a technical revision.

The main changes with respect to the superseded documents are listed below:

(a) Subclause 4.2.3, *Alarm or output functions* was modified to ensure alarm devices cannot be adjustable outside their measuring range and to include requirements for de-activation of alarm devices.

(b) Subclause 4.2.7, *Stand-alone gas detection apparatus for use with separate control units* was added to allow separate evaluation of detection apparatus providing an industry recognized output signal.

(c) Subclause 4.2.8, *Separate control units for use with stand-alone gas detection apparatus* was added to allow separate evaluation of control unit apparatus using an industry recognized input signal.

(d) Subclause 4.2.9, *Software-controlled apparatus* was added to the document for improved evaluation of software. The added text is based upon the guiding principles and requirements of EN 50271.

(e) Subclause 4.5, *Diffusion sensors* was removed from the document based upon the redundant protection allowance for equipment used in Zone 0 areas, such as Ex ‘d’ ‘ia’ rated equipment.

(f) Subclause 5.2.1.1 was modified to require the center wavelength of the optical filters of two apparatus at the minimum and maximum limit of this Standard.

(g) Subclause 5.2.1.2 was modified to allow the order of testing within each block to be conducted at the discretion of the test laboratory.

(h) Subclause 5.3.11, *Communications options* was added to ensure maximum transaction rates are applied during testing.

(i) Subclause 5.3.12, *Gas detection apparatus as part of systems* was added to ensure maximum transaction rates are applied during testing.

(j) Subclause 5.4.6, *Alarm set point(s)* was modified to include text related to alarms that are activated at decreasing concentrations.

(k) Subclause 5.4.10, *Air velocity* was modified to include testing at 3 m/s and 6 m/s.

(l) Subclause 5.4.16, *Time of response (not applicable to spot-reading apparatus)* was modified to exclude recovery time test requirements for Group II apparatus with a volume fraction up to 100% LFL indication.

(m) Subclause 5.4.18, *High gas concentration operation above the measuring range* was modified to define the sequence of tests.

(n) Annex A, *Performance requirements* has undergone major modifications by eliminating the gas/vapour table and replacing the annex with the performance requirements of Parts 2 to 5 of the former edition. Additionally, performance requirements of Parts 2 to 5 were adjusted for consistency as appropriate. The intent of this change is to condense Parts 1 to 5 within a single Standard.

This part of AS/NZS 60079.29 is to be used in conjunction with the following Standards:

(i) AS/NZS 60079.0, *Electrical apparatus for explosive gas atmospheres, Part 0: General requirements*

(ii) AS/NZS 60079.29.2, *Explosive atmospheres*, Part 29-2: *Gas detectors—Selection, installation, use and maintenance of detectors for flammable gases and oxygen*.

As this Standard is reproduced from an International Standard, the following applies:

(A) In the source text ‘IEC 60079-29-1’ should read ‘AS/NZS 60079.29.1’.

(B) A full point should be substituted for a comma when referring to a decimal marker.

The terms ‘normative’ and ‘informative’ are used to define the application of the annex to which they apply. A normative annex is an integral part of a Standard, whereas an informative annex is only for information and guidance.

# CONTENTS

# INTRODUCTION

Guidance for the selection, installation, use and maintenance of gas detecting apparatus are 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.

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# Australian/New Zealand Standard

# Explosive atmospheres
# Part 29.1: Gas detectors—Performance requirements of detectors for flammable gases

## 1 Scope

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 apparatus for the detection and measurement of flammable gas or vapour concentrations with air. The apparatus, or parts thereof, are intended for use in potentially explosive atmospheres (see 3.1.8) and in mines susceptible to firedamp.

This Standard is also applicable when an apparatus manufacturer makes any claims regarding any special features of construction or superior performance that exceed these minimum requirements. In these cases, all such claims should be verified and the test procedures should be extended or supplemented, where necessary, to verify the performance claimed by the manufacturer. When verifying the superior performance of one criterion, other performance criteria are not required to meet the Standards minimum requirements, however, these reduced claimed performance criteria (as confirmed in the manufactures Installation Manual) should also be verified. (e.g. temperature range of 0 °C to 60 °C; 0 °C to 40 °C at ±10 % accuracy and 40 °C to 60 °C at ±15 % (manufacturers claimed accuracy). The additional tests should be agreed between the manufacturer and test laboratory and identified and described in the test report.

This Standard is applicable to flammable gas detection apparatus intended to provide an indication, alarm or other output function; the purpose of which is to give a warning of a potential explosion hazard and, in some cases, to initiate automatic or manual protective action(s).

This Standard is applicable to apparatus, including the integral sampling systems of aspirated apparatus, intended to be used for commercial, industrial and non-residential safety applications.

This Standard does not apply to external sampling systems, or to apparatus of laboratory or scientific type, or to apparatus used only for process control purposes. It also does not apply to open path (line of sight) area monitors. For apparatus used for sensing the presence of multiple gases, this Standard applies only to the detection of flammable gas or vapour.

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 requirements of IEC 60079-29-1 will take precedence.

NOTE 1 - IEC 60079-29-1 is intended to provide for the supply of apparatus giving a level of safety and performance suitable for general purpose applications. However, for specific applications, a prospective purchaser (or an appropriate authority) may additionally require the apparatus to be submitted to particular tests or approval. For example, group I apparatus (i.e. apparatus to be used in mines susceptible to firedamp) may not be permitted to be used without the additional, prior approval of the relevant authority in mines under its jurisdiction. Such particular tests/approval are to be regarded as additional to and separate from the provisions of the Standards referred to above and do not preclude certification to or compliance with these Standards.

NOTE 2 - All apparatus calibrated on specific gases or vapours can not be expected to correctly indicate on other gases or vapours.

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