

Australian/New Zealand Standard™

**Explosive atmospheres**

**Part 29.2: Gas detectors—Selection,  
installation, use and maintenance of  
detectors for flammable gases and  
oxygen**



## **AS/NZS 60079.29.2:2008**

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. This Standard was published on 19 February 2008.

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*This Standard was issued in draft form for comment as DR 07331.*

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# Australian/New Zealand Standard™

## Explosive atmospheres

### Part 29.2: Gas detectors—Selection, installation, use and maintenance of detectors for flammable gases and oxygen

Originated as AS/NZS 61779.6:2000.  
Revised and redesignated as AS/NZS 60079.29.2:2008.

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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 61779.6.

The objective of this Standard is to provide guidance on, and recommended practice for, the selection, installation, safe use and maintenance of electrically operated group II apparatus intended for use in industrial and commercial safety applications for the detection and measurement of flammable gases complying with the requirements of AS/NZS 60079.29.1.

This Standard is identical with, and has been reproduced from IEC 60079-29-2, Ed. 1.0 (2007), *Explosive atmospheres – Part 29-2: Gas detectors—Selection, installation, use and maintenance of detectors for flammable gases and oxygen*.

This first edition of AS/NZS 60079.29.2 supersedes AS/NZS 61779.6 and constitutes a technical revision.

The main changes with respect to the superseded document are listed below:

- (a) Introduction was modified to provide a reference table for application of the particular document sections to specific job related functions.
- (b) Clause 4, *Basic information on the properties, behaviour, and detection of gases and vapours* was added for user guidance on characteristics of gases and vapours.
- (c) Clause 5, *Measuring principles*, Clause 6, *Selection of apparatus*, Clause 7, *Behaviour of gas releases*, Clause 8, *Design and installation of fixed gas detection systems*, Clause 9, *Use of portable and transportable flammable gas detection apparatus*, Clause 10, *Training of operational personnel*, and Clause 11, *Maintenance, routine procedures and general administrative control* were modified to reflect the text from EN 50073 and Chapter 14 of HB 13:2007.
- (d) Annex A, *Flammable limits (LFL and UFL) of certain flammable gases and vapours* was removed and replaced by a detailed review of measuring principles.
- (e) Annex B, *Environmental parameters* was added to provide a summary of the minimum required environmental parameters for gas detection apparatus.

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 60079.29.1, *Explosive atmospheres, Part 29.1: Gas detectors—Performance requirements of detectors for flammable gases*.

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

- (A) In the source text ‘IEC 60079-29-2’ should read ‘AS/NZS 60079.29.2’.
- (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

	<i>Page</i>
Introduction .....	v
1 Scope .....	1
2 Normative references .....	2
3 Terms and definitions .....	3
4 Basic information on the properties, behaviour, and detection of gases and vapours .....	8
4.1 Detecting gases and vapours – General .....	8
4.2 Some common properties of gases and vapours .....	10
4.3 The differences between detecting gases and vapours .....	11
4.4 Oxygen deficiency .....	15
5 Measuring principles .....	17
5.1 Catalytic sensors .....	17
5.2 Thermal conductivity sensors .....	19
5.3 Infrared sensors .....	21
5.4 Semiconductor sensors .....	22
5.5 Electrochemical sensors .....	23
5.6 Flame ionization detectors (FID) .....	25
5.7 Flame temperature analysers (FTA) .....	26
5.8 Photo ionisation detector (PID) .....	26
5.9 Paramagnetic oxygen detector .....	28
6 Selection of apparatus .....	28
6.1 General .....	29
6.2 Selection criteria .....	29
6.3 Miscellaneous factors affecting selection of apparatus .....	33
7 Behaviour of gas releases .....	34
7.1 Nature of a release .....	34
7.2 Buildings and enclosures .....	36
7.3 Unventilated buildings and enclosures .....	36
7.4 Ventilated buildings and enclosures .....	36
7.5 Natural ventilation .....	37
8 Design and installation of fixed gas detection systems .....	38
8.1 Basic considerations for the installation of fixed systems .....	38
8.2 Location of detection points .....	39
8.3 Access for calibration and maintenance .....	42
8.4 Additional considerations for sample lines .....	42
8.5 Summary of considerations for the location of sensors or sampling points .....	43
8.6 Installation of sensors .....	44
8.7 Integrity and safety of fixed systems .....	44
8.8 Timing of installation during construction operations .....	45
8.9 Commissioning .....	45
8.10 Operating instructions, plans and records .....	46

	<i>Page</i>
9 Use of portable and transportable flammable gas detection apparatus .....	47
9.1 General.....	47
9.2 Initial and periodic check procedures for portable and transportable instrumentation .....	48
9.3 Guidance on the use of portable and transportable apparatus.....	51
10 Training of operational personnel.....	53
10.1 General.....	53
10.2 General training – Basic limitations and safety.....	53
10.3 Operator training.....	54
10.4 Maintenance training.....	55
11 Maintenance, routine procedures and general administrative control.....	55
11.1 General.....	55
11.2 Operational checks .....	56
11.3 Maintenance .....	57
11.4 Sensors .....	59
11.5 Flow systems.....	59
11.6 Readout devices .....	60
11.7 Alarms .....	60
11.8 Workshop calibration test and equipment.....	60
Annex A (normative) Measuring principles.....	63
Annex B (informative) Environmental parameters .....	81
Annex C (informative) Typical environmental and application check-list for flammable gas detectors .....	82
Annex D (informative) Typical instrument maintenance record for flammable gas detectors.....	84
Bibliography .....	85

## INTRODUCTION

Flammable gas detection apparatus may be used whenever there is the possibility of a hazard to life or property caused by the accumulation of a flammable gas-air mixture. Such apparatus can provide a means of reducing the hazard by detecting the presence of a flammable gas and issuing suitable audible or visual warnings. Gas detectors may also be used to initiate precautionary steps (for example plant shutdown, evacuation, and operation of fire extinguishing procedures).

Apparatus may be used to monitor a gas atmosphere below the lower flammable limit in circumstances where accumulation of gas may result in a concentration of the gas/air mixture to potentially explosive levels. Performance requirements for gas detecting apparatus for such purposes are set out in IEC 60079-29-1.

However performance capability alone cannot ensure that the use of such apparatus will properly safeguard life or property where flammable gases may be present. The level of safety obtained depends heavily upon correct selection, installation, calibration and periodic maintenance of the apparatus, combined with knowledge of the limitations of the detection technique required. This cannot be achieved without responsible informed management.

An additional hazard to life is the toxicity of some gases and of the vapours of all liquids except water. It is not generally appreciated that all flammable vapours are potentially toxic at concentration levels which are very small fractions of their respective lower flammable limits. Apparatus covered by the IEC 60079-29-1 is not specifically intended for toxic protection, and additional personal protection precautions will normally be needed where personnel could be exposed to toxic vapours.

Portable apparatus covered by the IEC 60079-29-1 and the IEC 60079-29-2 commonly have additional detectors for specific toxic gases and also for oxygen deficiency. Users are cautioned that even mild oxygen deficiency may be due to toxic concentrations of some other gas or vapour, which may not be detectable or adequately detected by the apparatus in use.

General requirements for the handbook or manual of any particular flammable gas detection apparatus are specified in IEC 60079-29-1. This standard provides some necessary background knowledge on the points mentioned above.

This standard has been specifically written to cover all the functions necessary to go from the need for gas detection all the way through ongoing maintenance of a successful gas detection operation. Different clauses are appropriate for different tasks within this range of operations. Each clause has been written as stand-alone as far as practicable. This meant that some information is repeated in different clauses but with a different emphasis.

The following table gives a broad suggestion as to the most relevant clauses to the typically tasks to be performed.

## STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

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**Australian/New Zealand Standard****Explosive atmospheres****Part 29.2: Gas detectors—Selection, installation, use and maintenance of detectors for flammable gases and oxygen**

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**1 Scope**

This part of IEC 60079-29 gives guidance on, and recommended practice for, the selection, installation, safe use and maintenance of electrically operated group II apparatus intended for use in industrial and commercial safety applications for the detection and measurement of flammable gases complying with the requirements of IEC 60079-29-1.

This standard is applicable for oxygen measurement for the purpose of inertisation where explosion protection is provided by the exclusion of oxygen instead of measuring the combustible gases or vapours present.

This standard is a compilation of practical knowledge to assist the user, and applies to apparatus, instruments and systems that indicate the presence of a flammable or potentially explosive mixture of gas or vapour with air by using an electrical signal from a gas sensor to produce a meter reading, to activate a visual or audible pre-set alarm or other device, or any combination of these.

Such apparatus may be used as a means of reducing the risk whenever there is the possibility of a risk to life or property specifically due to the accumulation of a combustible gas-air mixture, by providing such warnings. It may also be used to initiate specific safety precautions (e.g. plant shutdown, evacuation, fire extinguishing procedures).

This standard is applicable to all new permanent installations and, where reasonably practicable, to existing permanent installations. It is also applicable to temporary installations, whether new or existing.

Similarly it is applicable to the safe use of portable or transportable apparatus, irrespective of the age or complexity of such apparatus. Since much modern apparatus of this type also includes oxygen deficiency detection and/or specific toxic gas sensors, some additional guidance is given for these topics.

**NOTE** When in classified areas, the apparatus should be so installed and used that it is not capable of itself igniting a combustible gas-air mixture. It should therefore comply with the requirements of IEC 60079-10.

For the purposes of this standard, except where specifically stated otherwise, flammable gases shall include flammable vapours.

This standard applies only to group II apparatus (i.e. apparatus intended for use in industrial and commercial safety applications, involving areas classified in accordance with IEC 60079-10).

For the purposes of this standard, apparatus includes

- a) fixed apparatus;
- b) transportable apparatus; and
- c) portable apparatus.